All India Medical Scholarship Entrance Test



All India Medical Scholarship Entrance Test AIMSET is a National Level Scholarship Test www.aimset.in

Test Booklet Code

KANHA

No. :



This Booklet contains 24 pages.

Do not open this Test Booklet until you are asked to do so.

Important Instructions :

- 1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on **side-1** and **side-2** carefully with **blue/black** ball point pen only.
- 2. The test is of **3 hours** duration and Test Booklet contains **180** questions. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. The maximum marks are **720**.
- 3. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/marking responses.
- 4. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
- 5. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
- 6. The CODE for this Booklet is **E1**. Make sure that the CODE printed on Side-2 of the Answer Sheet is the same as that on this Test Booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
- 7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/ Answer Sheet.
- 8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
- 9. Each candidate must show on demand his/her Admit Card to the Invigilator.
- 10. No candidate, without special permission of the Superintendent or Invigilator, would leave his/her seat.
- 11. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet twice. Cases where a candidate has not signed the Attendance Sheet second time will be deemed not to have handed over the Answer Sheet and dealt with as an unfair means case.
- 12. Use of Electronic/Manual Calculator is prohibited.
- 13. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
- 14. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
- 15. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

 Name of the Candidate (in Capitals) :

 Roll Number
 : in figures

 : in words

 Centre of Examination (in Capitals) :

 Candidate's Signature :

 Facsimile signature stamp of

 Centre Superintendent :

E1		2	4							
22.		tify the wrong statement with regard to riction Enzymes.	26.		ch of the fo hylum-Ch		; stater	nents are true for		
	(1)	Each restriction enzyme functions by inspecting the length of a DNA sequence.		(a)		tail and		ord extends from resent throughout		
	(2)	They cut the strand of DNA at palindromic sites.		(b)	In Vertel the embr			d is present during ly.		
	(3)	They are useful in genetic engineering.		(c)	Central nervous system is dorsal and hollow.					
	(4)	Sticky ends can be joined by using DNA ligases.		(d)		ordata	, Т	into 3 subphyla : 'unicata and		
23.		ch of the following is put into Anaerobic sludge		(1)	(d) and (c					
	-	ster for further sewage treatment ?			(2) (c) and (a) (2) $(a) = (a) (a) (a) (a) (a) (a) (a) (a) (a) (a)$					
	(1)	Primary sludge		(3) (4)	(a) and (b)					
	(2)	Floating debris	PLA	(4)	(0) and (0	(b) and (c)				
	(3)	Effluents of primary treatment	27.	Mate	ch the o <mark>rga</mark>	nism wit	th its us	se in biotechnology.		
	(4)	Activated sludge		(a)	Bacillus thuringie	ensis	(i)	Cloning vector		
24.		ct the correct events that occur during iration.		(b)	Thermus aquaticu		(ii)	Construction of first rDNA molecule		
	(a)	Contraction of diaphragm	×.	(c)	Agrobact	orium	(iii)	DNA polymerase		
	(b)	Contraction of external inter-costal muscles	3	(0)	tumefaci	ens	(III)	Divipolymerase		
	(c)	Pulmonary v <mark>olum</mark> e decreases		(d)	Salmone typhimu		(iv)	Cry proteins		
	(d)	Intra pulmonary pressure increases		Select the correct option from the following :						
	(1)	(a) and (b)			(a) (b)		(d)			
	(2)	(c) and (d)	D		(ii) (iv					
	(3)	(a), (b) and (d)	-	(2)	(iv) (iii (iii) (ii)		(ii)			
	(4)	only (d)	.4tc	(3) (4)	(iii) (ii) (iii) (iv)		(i) (ii)			
25.		e head of cockroach is removed, it may live for days because :	28.	and t	their funct	ions in p	lants :			
	(1)	the supra-oesophageal ganglia of the		(a) (b)	Iron Zinc	(i) (ii)		olysis of water en germination		
		cockroach are situated in ventral part of abdomen.		(b) (c)	Boron	(ii) (iii)	Requ	uired for chlorophyll rnthesis		
	(2)	the cockroach does not have nervous system.		(d)	Mangane	se (iv)	-	biosynthesis		
	(3)	the head holds a small proportion of a nervous			ct the corr					
	(-)	system while the rest is situated along the			(a) (b)	-	(d)			
		ventral part of its body.		(1)	(ii) (i)	(iv)	(iii)			
	(4)	the head holds a 1/3 rd of a nervous system		(2)	(iv) (iii) (ii)	(i)			
		while the rest is situated along the dorsal part of its body.		(3)	(iii) (iv		(i)			
		pui voi 100 vouy.		(4)	(iv) (i)	(ii)	(iii)			

29.	Iden (1)	tify the inco	rrect s	statem	ent								
	(1)	TTo out month			0110.		34.						of the globe exhibits
					luct wa	ater but gives		-	-		versity		
		mechanica			_			(1)			hats of	India	
	(2)	Sapwood is and miner				tion of water		(2) (3)		agasca alayas			
	(3)					ndary xylem		(4)		zon foi			
	(0)	and is ligh			si secu	nuary xyleni		(1)	11110	2011101	0000		
	(4)	Due to depo heart wood				sins, oils etc.,	35.	corr	ect?				atements is not
30.	Mate	ch the follow:	ing :					(1)		nan 1 1sulin.	nsulıı	1 1S S	ynthesised as a
	(a)	Inhibitor o activity	f cataly	vtic	(i)	Ricin		(2) The proinsulin has an extra peptide ca C-peptide.					
	(b)	Possess per	otide bo	onds	(ii)	Malonate		(3)					has A and B chains ogen bonds.
	(c)	Cell wall m fungi	-		(iii)	Chitin	LA	(4)	Gene		-	-	insulin is produced
	(d)	Secondary	metabo	olite	(iv)	Collagen		~	1/0				
	Choo	ose the corre	e ct opti	ion froi	n the f	ollowing :	36.					of a pla	ant shows following
		(a) (b)	(c)	(d)						featu			
	(1)	(ii) (iv)	(iii)	(i)				(a)			ber of s l by bu		ed vascular bundles heath.
	(2)	(iii) (i)	(iv)	(ii)			12	(b)	-	e consj .e.		s parer	nchymatous ground
		(3) (iii) (iv) (i) (ii) (ii) (4) (ii) (iii) (ii) (ii)						(c)				conjoi	nt and closed.
	(4)	(ii) (iii)	(i)	(iv)				(d) Phloem parenchyma absent.					
31.	Mei	otic divisio	n of th	ne sec	ondar	y oocyte is		Iden	tify th	e categ	g <mark>ory o</mark> f	plant	and its part :
	comp	oleted :		1	$\sum_{i=1}^{n}$			(1)	Mon	ocotyle	donou	s stem	
	(1)	Prior to ov	ulation		P			(2)	Mon	ocotyle	donou	s root	
	(2)	At the time	e of cop	ulatior	1			(3)			nous st		
	(3)	After zygot	e forma	ation			/	(4)	Dico	tyledoi	nous ro	ot	
	(4)	At the tim ovum	e of fu	ision o	f <mark>a s</mark> pe	erm with an	37.		ch the ect op		wing o	colum	ns and select the
32.	Acco	ording to Re	hert N	May t	he gla	bal species			Colu	ımn -	I		Column - II
		rsity is about		ilay, u	ne gie	species		(a)	6 - 1	5 pairs	of	(i)	Trygon
	(1)	1.5 million							$_{ m gills}$	lits			
	(2)	20 million						(b)	Hete	rocerc	al	(ii)	Cyclostomes
	(3)	50 million							caud	alfin			
	(4)	7 million						(c)	Air E	Bladder	ſ	(iii)	Chondrichthyes
~~	7 21						(d)	Poise	on stin	g	(iv)	Osteichthyes	
33.		first phase of							(a)	(b)	(c)	(d)	
	(1)	Binding of						(1)	(ii)	(iii)	(iv)	(i)	
	(2)	Recognitio						(2)	(iii)	(iv)	(i)	(ii)	
	(3)	Aminoacyl						(3)	(iv)	(ii)	(iii)	(i)	
	(4)	Recognitio	n of an	anti-co	odon			(4)	(i)	(iv)	(iii)	(ii)	

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$\mathbf{E1}$

- 6
- **38.** From his experiments, S.L. Miller produced amino acids by mixing the following in a closed flask :
 - (1) CH_4 , H_2 , NH_3 and water vapor at 800°C
 - (2) CH_3 , H_2 , NH_4 and water vapor at 800°C
 - (3) CH_4 , H_2 , NH_3 and water vapor at 600°C
 - (4) CH_3 , H_2 , NH_3 and water vapor at 600°C
- **39.** Embryological support for evolution was disapproved by:
 - (1) Karl Ernst von Baer
 - (2) Alfred Wallace
 - (3) Charles Darwin
 - (4) Oparin
- 40. The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is :
 - (1) Transpiration
 - (2) Root pressure
 - (3) Imbibition
 - (4) Plasmolysis
- 41. Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their :
 - (1) Nutritive value
 - (2) Growth response
 - (3) Defence action
 - (4) Effect on reproduction
- **42.** The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of :
 - (1) 2 molecules of 3-C compound
 - (2) 1 molecule of 3-C compound
 - (3) 1 molecule of 6-C compound
 - (4) 1 molecule of 4-C compound and 1 molecule of 2-C compound
- **43.** Bt cotton variety that was developed by the introduction of toxin gene of *Bacillus thuringiensis* (Bt) is resistant to :
 - (1) Insect pests
 - (2) Fungal diseases
 - (3) Plant nematodes
 - (4) Insect predators

- 44. Which of the following refer to **correct** example(s) of organisms which have evolved due to changes in environment brought about by anthropogenic action ?
 - (a) Darwin's Finches of Galapagos islands.
 - (b) Herbicide resistant weeds.
 - (c) Drug resistant eukaryotes.
 - (d) Man-created breeds of domesticated animals like dogs.
 - (1) only(a)
 - (2) (a) and (c)
 - (3) (b), (c) and (d)
 - (4) only (d)
- **45.** Identify the **wrong** statement with reference to immunity.
 - When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
 - (2) When ready-made antibodies are directly given, it is called "Passive immunity".
 - (3) Active immunity is quick and gives full response.
 - (4) Foetus receives some antibodies from mother, it is an example for passive immunity.
- **46.** By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams ?
 - (1) Out crossing
 - (2) Mutational breeding
 - (3) Cross breeding
 - (4) Inbreeding
- **47.** Identify the **correct** statement with reference to human digestive system.
 - (1) Ileum opens into small intestine.
 - (2) Serosa is the innermost layer of the alimentary canal.
 - (3) Ileum is a highly coiled part.
 - (4) Vermiform appendix arises from duodenum.

E1

						-	7						E 1	
48.				wing	colum	ns and select the	52.	Mate	ch the :	followi	ng wit	h resp	ect to meiosis :	
	corr	ect op	tion.					(a)	Zygo	tene	(i)	Tern	ninalization	
		Colı	umn -	I		Column - II		(b)	Pach	ytene	(ii)	Chia	smata	
	(a)	Clos	tridiur	п	(i)	Cyclosporin-A		(c)	Diplo	otene	(iii)	Cros	sing over	
		buty	licum					(d)	Diak	Diakinesis		Syna	psis	
	(b)	Tric	hodern	na	(ii)	Butyric Acid		Select the correct option from the following :						
		polys	sporun	n					(a)	(b)	(c)	(d)		
	(c)	Mon	ascus		(iii)	Citric Acid		(1)	(iii)	(iv)	(i)	(ii)		
			oureus					(2)	(iv)	(iii)	(ii)	(i)		
	(d)	Asna	ergillus	niger	(iv)	Blood cholesterol		(3) (4)	(i) (ii)	(ii) (iv)	(iv) (iii)	(iii) (i)		
	(u)	115/0	, guiue	sniger	(11)	lowering agent			(II)					
		(a)	(b)			CHC	53.	Which of the following pairs is of unicellula algae?						
		(a)	(b)	(c)	(d)	ALSCHO	LA	(1)	A	inaria	and S	argass	um	
	(1)	(iii)	(iv)	(ii)	(i)	AL		(1)	88 M	dium a		-		
	(2)	(ii)	(i)	(iv)	(iii)	×//~~		(3)						
	(3)	(i)	(ii)	(iv)	(iii)			(4)	(4) Chlorella and Spirulina					
	(4) (iv) (iii) (ii) (i)						54.	Whi	ah of th	o follo	wingl		ne levels will cause	
							04.						from the graffian	
49.						wing conditions in		follic		15				
		e are indicativ <mark>e of</mark> Diabetes					(1)	/				strogen		
	(1)	Urer	nia an	d Keto	nuria	culi (3)	(2)					rogesterone		
	(2)	Urer	nia an	d Rena	al Calc		alculi	 (3) Low concentration of LH (4) Low concentration of FSH 						
	(3)	Keto	onuria	and Gl	ycosur	ia								
	(4)	Rena	al calcı	ıli and	Hyper	glycaemia	55.	Match the following columns and select th correct option.						
							_	COIL	- X	1mn -]	г		Column - II	
50.	Flori	idean	starch	has st	ructur	e similar to :	च्छारे	(a)	Bt co		•	(i)	Gene therapy	
	(1)	Star	ch and	cellul	ose			(a) (b)		nosine		(i) (ii)	Cellular defence	
	(2)	Amy	lopecti	in and	glycog	en		(0)		ninase		(II)	Cellular delence	
	(3)	Man	nitol a	nd alg	in					iency				
	(4)			0	ellulose			(c)	-		Detection of HIV			
	(-)												infection	
51.	Seleo disea	ect the option including all sexually transmit ases.				exually transmitted		(d)	PCR			(iv)	Bacillus thuringiensis	
	(1)	Gonorrhoea, Syphilis, Genital herpes						(a)	(b)	(c)	(d)			
	(2)	Gonorrhoea, Malaria, Genital herpes AIDS, Malaria, Filaria				enital herpes		(1)	(iv)	(i)	(ii)	(iii)		
	(3)					_		(2)	(iii)	(ii)	(i)	(iv)		
	(4)		Cancer, AIDS, Syphilis					(3)	(ii)	(iii)	(iv)	(i) (i)		
	(-1)	Jan	, 111		Lunio			(4)	(i)	(ii)	(iii)	(iv)		

E1							8	8						
56.	Mon of :	treal p	orotocc	lwas	signed	in 198	7 for control	61.	Men	del sel	ect as p	airs, v	which w	plant varieties did vere similar except
	(1)		-		tically to ano		ed organisms		(1)	4	acter v	vith co	ontrast	ting traits ?
	(2)	Emi	ssion o	fozone	e deplet	ting su	bstances		(2)	2				
	(3)	Rele	ase of (Green	House	gases			(3) (4)	14 8				
	(4)	Disp	osal of	e-wast	tes			62.	Mat	ch the		ving (colum	ns and select the
57.	Whi	ch of tl	ne follo	wing i	s corr	ect ab	out viroids ?		corr	ect op	uon. 1 mn - I			Column - II
	(1)	The	y have	RNA v	vith pr	otein c	oat.		(a)				(i)	Connects middle
	(2)	The	y have	free R	NA wit	hout p	rotein coat.		(a)	(a) Organ of Corti (i) Connects middl ear and pharyn				
	(3)	They have DNA with protein coat.							(b)				Coiled part of the	
	(4)	They have free DNA without protein coat.											. ,	labyrinth
FO	The s		: - h - 1f	: f:		5	SCR	LA	(c)	Eust	achian	tube	(iii)	Attached to the oval window
58.		-	is half	merio	or in .	ω,			(d)	Stap	es		(iv)	Located on the
	(1)	Brin	-		1.9				. ,		2			basilar
	(2)	Mus			X						70			membrane
	(3)		lower		-			17-		(a)	(b)	(c)	(d)	
	(4)	Plur	n		\leq			2	(1) (2)	(ii) (iii)	(iii) (i)	(i) (iv)	(iv) (ii)	
					0			No.	(2) (3)	(iv)	(i) (ii)	(i)	(iii)	
59.		enzyme enterokinase helps in conversion of :							(4)	(i)	(ii)	(iv)	(iii)	
	(1)	-			eptides	> >		63.	Inw	ater hy	acinth	and w	aterlil	v. pollination takes
	(2)				trypsin	rb-			In water hyacinth and water lily, pollination takes place by :					
	(3)		inogen			1			(1)					
	(4)	peps	inogen	into p	epsin			9	(2)		er curre		ly	
60.	Mate	h the t	ronhic	levels	with th	eir co	rrect species		(3)	(3) wind and water(4) insects and water				
			-		cosyst		rectopecies							1, 1, 1
	(a)	Fou	rth troj	phic le	vel	(i)	Crow	64.	spra	ying oi	n sugar	cane o	crop, ir	ulator which upon acreases the length
	(b)	Seco	nd troj	phic lev	vel	(ii)	Vulture		of st crop.		ius inci	reasin	g the	yield of sugarcane
	(c)	Firs	t troph	ic leve	1	(iii)	Rabbit		(1)	-	kinin			
	(d)	Thir	d tropl	nic leve	el	(iv)	Grass		(2) (3)	(2) Gibberellin(3) Ethylene				
	Sele	ct the	correc	et optio	on:				(4)	-	isic aci	d		
		(a) (b) (c) (d)						65.	In li	ght re	action	nlast	oquin	one facilitates the
	(1)	(ii)	(iii)	(iv)	(i)						electro			
	(2)	(iii)	(ii)	(i)	(iv)				(1)		I to Cyt			
	(3)	(iv)	(iii)	(ii)	(i)				(2)		6f com		PS-I	
	(4)							 (3) PS-I to NADP⁺ (4) PS-I to ATP synthase 						
	(1)	(I)	(ш)	(III)	(11)				(4)	PS-1	to ATP	' synti	nase	

66. Which of the following is not an inhibitory substance governing seed dormancy?
(1) Gibberellic acid
(2) Abscisic acid
(3) Phenolic acid

- (4) Para-ascorbic acid
- **67.** Name the enzyme that facilitates opening of DNA helix during transcription.

ALSCH

- (1) DNA ligase
- (2) DNA helicase
- (3) DNA polymerase
- (4) RNA polymerase
- **68.** Which of the following would help in prevention of diuresis ?
 - (1) More water reabsorption due to undersecretion of ADH
 - (2) Reabsorption of Na⁺ and water from renal tubules due to aldosterone
 - (3) Atrial natriuretic factor causes vasoconstriction
 - (4) Decrease in secretion of renin by JG cells
- **69.** In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is **correct** ?
 - (1) Gross primary productivity is always less than net primary productivity.
 - (2) Gross primary productivity is always more than net primary productivity.
 - (3) Gross primary productivity and Net primary productivity are one and same.
 - (4) There is no relationship between Gross primary productivity and Net primary productivity.

0.	Match	the	following	columns	and	select	the	
	correc	t opt	ion.					

		corre	correct option.										
			Colu	mn -]	[Column - II						
		(a)	Place	nta		(i)	Androgens Human Chorionic Gonadotropin (hCG) Layer of the ovum Lubrication of the Penis						
		(b)	Zona	pelluc	ida	(ii)	Gonadotropin						
		(c)	Bulbo gland	o-uretł ls	nral	(iii)	Layer of the ovum						
		(d)	Leyd	ig cells	3	(iv)							
			(a)	(b)	(c)	(d)							
		(1)	(iv)	(iii)	(i)	(ii)							
	LA	(2)	(i)	(iv)	(ii)	(iii)							
	_	(3)	(iii)	(ii)	(iv)	(i)							
		(4)	(ii)	(iii)	(iv)	(i)							
	71.	Strob	ili or c	ones a	are four	nd in :							
1		(1)	Salvi	nia									
		(2)	Pteri	s									
		(3)	Marc	hantic	ı								
		(4)	Equis	setum									
	72.	veget	ative i	nactiv	e stage	e. This	ell cycle and enter is called quiescent s at the end of :						
		(1)	Mph	ase									
		(2)	G_1 ph	nase									
		(3)	Spha	ise									
		(4)	G_2 ph	nase									
	73.	Flipp of :	ers of	Pengu	iins an	d Dolp	hins are examples						
		(1)	Adap	tive ra	diation	ı							
		(2)	Conv	ergent	evolut	ion							
		(3)	Indu	strial 1	nelanis	sm							
		(4)	Natu	ral sel	ection								

- 74. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately:
 - (1) 2.0 meters
 - $(2) \qquad 2.5 \text{ meters}$
 - (3) 2.2 meters
 - (4) 2.7 meters

E1					1	0						
75.	The (1)	QRS compl Repolaris			d ECG represents : es	80.		ch the ect op		wing	colum	ns and select the
	(2)	Depolaria	sation o	fauricle	es			Colı	ımn -	I		Column - II
	(3)	Depolaris	sation o	fventri	cles			_				
	(4)	Repolaris	sation of	fventrio	eles		(a)	Pitu	Pituitary gland (i) Gi			Grave's disease
76.		ch the foll ect option.		colum	ns and select the		(b)				(ii)	Diabetes mellitus
		Column	- I		Column - II		(c)	Adre	enal gla	and	(iii)	Diabetes insipidus
	(a)	Eosinoph	ils	(i)	Immune response		(d)	Pano	reas		(iv)	Addison's disease
	(b)	Basophils	3	(ii)	Phagocytosis			(a)	(b)	(c)	(d)	
	(c)	Neutroph	ils	(iii)	Release			(a)	(0)	(0)	(u)	
		-		. ,	histaminase,		(1)	(iv)	(iii)	(i)	(ii)	
		Lymphocytes (iv) (a) (b) (c) (d)			destructive	LA	(2)	(iii)	(ii)	(i)	(iv)	
					enzymes		(3)	(iii)	(i)	(iv)	(ii)	
	(d)				Release granules			~ <i>/</i> 0	~		. ,	
					containing		(4)	(ii)	(1)	(iv)	(iii)	
					histamine				5			
	(1)			(d)		81.	Selec	ct the c	correc	et state	ement	
	(1) (2)	(iii) (iv)		(i) (iii)		25	(1)	Gluc	ocortic	coids st	imula	te gluconeogenesis.
	(2) (3)						(2)	Glue	agon i	s assoc	iated v	with hypoglycemia.
	(4)	(ii) (i)	(iii)	(iv)		37			100			
				12			(3)		ilin a ocytes.	cts oi	ı pan	creatic cells and
77.	Whie	ch of the fol	lowing	statem	ents is correct ?			/.0	77	7.		
	(1)	Adenine H-bonds.	pairs v	vith thy	mine through two	-	(4)	Insu	lin is a	ssocia	ted wi	th hyperglycemia.
	(2)	Adenine H-bond.	pairs v	vith thy	mine through one	82.	. Which one of the following is the most abunda protein in the animals ?					
	(3)	Adenine H-bonds.	pairs w	ith thy	nine through three	सर्वे	(1)	Haeı	noglob	in		
	(4)	Adenine	does no	t pair w	ith thymine.		(2)	Colla	ıgen			
78.		sequence th ed DNA in t			copy number of the ermed :		(3)	Lect	in			
	(1)	Selectabl					(4)	Insu	lin			
	(2)	Ori site										
	(3)	Palindro	nic seq	uence		83.	Expe	erimer	ntal ve	erificat	tion of	f the chromosomal
	(4)	Recogniti	on site				theor	ry of ir	herita	ance w	as don	e by :
79.	Iden	tify the bas	sic amir	no acid f	rom the following.		(1)	Men	del			
	(1)	Tyrosine			(2) Sutton							
	(2)	Glutamic	Acid			(3) Boveri						
	(3)	Lysine Valias										
	(4)	Valine					(4)	Mor	gan			

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84.		ch the ect op		wing	colum	ns and select the	89.	Gobl from	et cells of alimentary canal are modified :
		Colu	umn -	I		Column - II		(1)	Squamous epithelial cells
	(a)	Floa	ting Ri	ibs	(i)	Located between		(2)	Columnar epithelial cells
						second and		(3)	Chondrocytes
						seventh ribs		(4)	Compound epithelial cells
	(b)	Acro	mion		(ii)	Head of the			
						Humerus	90.		v-blindness in Antarctic region is due to :
	(c)	Scap	oula		(iii)	Clavicle		(1)	Freezing of fluids in the eye by low temperature
	(d)	Gler	noid cav	vity	(iv)	Do not connect	_		Inflammation of cornea due to high dose of
						with the sternum		(2)	UV-B radiation
	<i>(</i>)	(a)	(b)	(c)	(d)			(3)	High reflection of light from snow
	(1)	(ii)	(iv)	(i)	(iii)	CHO	N A	(4)	Damage to retina caused by infra-red rays
	(2)	(i)	(iii)	(ii) (i)	(iv)	Scine	and had	KS,	<i>u</i> .
	(3) (4)	(iii) (iv)	(ii) (iii)	(iv) (i)	(i) (ii)	C.P.	91.	Iden	tify a molecule which does not exist.
	(4)	(1V)	(111)	(1)	(II)			(1)	He ₂
85.	The	ոսաթ	er of si	ibstra	te leve	l phosphorylations		(2)	Li ₂
					d cycle			(3)	C_2
	(1)	Zero			2		100	(4)	O_2
	(2)	(2) One						(1)	
	(3)	Two			9		0.9	Find	out the colubility of N ⁱ (OH) in 0.1 M NoOH
	(4)	Three	92.	Give	out the solubility of $Ni(OH)_2$ in 0.1 M NaOH. In that the ionic product of $Ni(OH)_2$ is				
	р.		0.1		1.			2×1	0-15
86.	Diss duri		n of the	e syna	ptonen	nal complex occurs		(1)	$2 \times 10^{-13} \mathrm{M}$
		-	nytene					(2)	$2 \times 10^{-8} \mathrm{M}$
	(2)	Zygo			1			(3)	$1 \times 10^{-13} \mathrm{M}$
	(3)	Diple	otene				5	(4)	$1 \times 10^8 \mathrm{M}$
	(4)	Lept	otene				. 44 c	1 mm	
87.	Dilot			otrico	landa	coelomate animals	93.		tify the correct statements from the wing:
01.		-	lified b		i allu a	coelomate animais		(a)	$CO_2(g)$ is used as refrigerant for ice-cream
	(1)	Cten	ophore	a				(a)	and frozen food.
	(2)	Plat	yhelmi	nthes				(b)	The structure of C_{60} contains twelve six
	(3)	Asch	nelmint	thes					carbon rings and twenty five carbon rings.
	(4)	Anne	elida					(c)	ZSM-5, a type of zeolite, is used to convert alcohols into gasoline.
88.		body c	of the o	vule i	s fused	within the funicle		(d)	CO is colorless and odourless gas.
	at : (1)	Hilu	m					(1)	(a), (b) and (c) only
	(1) (2)		opyle					(2)	(a) and (c) only
	(3)	Nuce						(3)	(b) and (c) only
	(4)	Chal						(4)	(c) and (d) only
	~ /							~ /	· · · · · ·

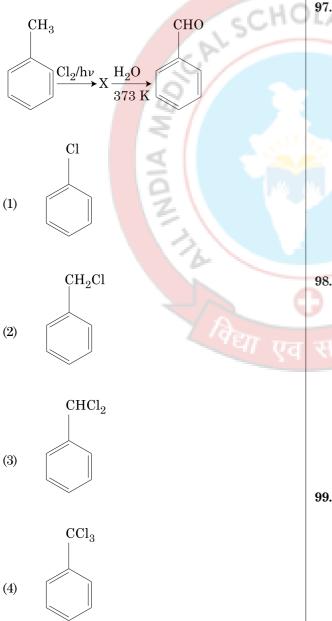
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94. Hydrolysis of sucrose is given by the following reaction.

$Sucrose + H_2O \rightleftharpoons Glucose + Fructose$

If the equilibrium constant (K_c) is 2×10^{13} at 300 K, the value of $\Delta_r G^{\ominus}$ at the same temperature will be :

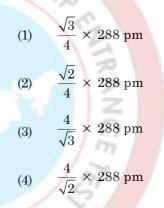
- (1) $-8.314 \, J \, mol^{-1} K^{-1} \times 300 \, K \times ln(2 \times 10^{13})$
- (2) $8.314 \,\mathrm{J}\,\mathrm{mol}^{-1}\mathrm{K}^{-1} \times 300 \,\mathrm{K} \times \ln(2 \times 10^{13})$
- (3) $8.314 \,\mathrm{J}\,\mathrm{mol}^{-1}\mathrm{K}^{-1} \times 300 \,\mathrm{K} \times \ln(3 \times 10^{13})$
- (4) $-8.314 \, J \, mol^{-1}K^{-1} \times 300 \, K \times ln(4 \times 10^{13})$
- **95.** Identify compound X in the following sequence of reactions :



96. Identify the incorrect match.

	Name	IUP	AC Official Name
(a)	Unnilunium	(i)	Mendelevium
(b)	Unniltrium	(ii)	Lawrencium
(c)	Unnilhexium	(iii)	Seaborgium
(d)	Unununnium	(iv)	Darmstadtium
(1)	(a), (i)		
(2)	(b), (ii)		
(3)	(c), (iii)		
(4)	(d), (iv)		

An element has a body centered cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is :



. Which of the following set of molecules will have zero dipole moment?

- (1) Ammonia, beryllium difluoride, water, 1,4-dichlorobenzene
- (2) Boron trifluoride, hydrogen fluoride, carbon dioxide, 1,3-dichlorobenzene
- (3) Nitrogen trifluoride, beryllium difluoride, water, 1,3-dichlorobenzene
- (4) Boron trifluoride, beryllium difluoride, carbon dioxide, 1,4-dichlorobenzene
- **99.** On electrolysis of dil.sulphuric acid using Platinum (Pt) electrode, the product obtained at anode will be :
 - (1) Hydrogen gas
 - (2) Oxygen gas
 - (3) H_2S gas
 - (4) SO_2 gas

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100.		tion between acetone and methylmagnesium ide followed by hydrolysis will give :	103.	The calculated spin only magnetic moment of $\rm Cr^{2+}$ ion is :		
	(1)	Isopropyl alcohol		(1) 3.87 BM		
	(2)	Sec. butyl alcohol		(2) 4.90 BM		
	(3)	Tert. butyl alcohol		(3) $5.92 \mathrm{BM}$		
	(4)	Isobutyl alcohol		(4) $2.84 \mathrm{BM}$		
101.	Whic	h of the following oxoacid of sulphur has	104.	The correct option for free expansion of an ideal gas under adiabatic condition is :		
	-0-	-O-linkage?		(1) $q = 0, \Delta T = 0 \text{ and } w = 0$		
	(1)	$ m H_2SO_3$, sulphurous acid		(2) $q = 0, \Delta T < 0 \text{ and } w > 0$		
	(2)	H_2SO_4 , sulphuric acid		(3) $q < 0, \Delta T = 0 \text{ and } w = 0$		
	(3)	$ m H_2S_2O_8$, peroxodisulphuric acid		(4) $q > 0, \Delta T > 0 \text{ and } w > 0$		
	(4)	H ₂ S ₂ O ₇ , pyrosulphuric acid	105.	The freezing point depression constant (K_f) of benzene is 5.12 K kg mol ⁻¹ . The freezing point		
102.		ch of the following amine will give the ylamine test?		depression for the solution of molality 0.078 m containing a non-electrolyte solute in benzene is (rounded off up to two decimal places):		
		NH ₂		(1) 0.20 K		
			15-	(2) 0.80 K		
	(1)		~	(3) 0.40 K		
	(1)	2 2		(4) 0.60 K		
		NHCH ₃	106.	The number of Faradays(F) required to produce 20 g of calcium from molten $CaCl_2$ (Atomic mass of $Ca = 40 \text{ g mol}^{-1}$) is :		
				(1) 1		
	(0)		3	(2) 2		
	(2)		_	(3) 3		
		िविंग एव	सवे	(4) 4		
		$N(CH_3)_2$	107.	Reaction between benzaldehyde and acetophenone in presence of dilute NaOH is known as :		
				(1) Aldol condensation		
	(3)			(2) Cannizzaro's reaction		
	(0)			(3) Cross Cannizzaro's reaction		
				(4) Cross Aldol condensation		
		$\mathrm{NHC}_{2}\mathrm{H}_{5}$	108.	Paper chromatography is an example of :		
				(1) Adsorption chromatography		
	(4)			(2) Partition chromatography		
				(3) Thin layer chromatography		
				(4) Column chromatography		

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14

- **109.** An increase in the concentration of the reactants of a reaction leads to change in :
 - (1) activation energy
 - (2) heat of reaction
 - (3) threshold energy
 - (4) collision frequency
- 110. A mixture of N_2 and Ar gases in a cylinder contains 7 g of N_2 and 8 g of Ar. If the total pressure of the mixture of the gases in the cylinder is 27 bar, the partial pressure of N_2 is :

[Use atomic masses (in $g \mod^{-1}$): N = 14, Ar = 40]

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- (1) 9 bar
- (2) 12 bar
- (3) 15 bar
- (4) 18 bar
- 111. Identify the **correct** statement from the following:
 - (1) Wrought iron is impure iron with 4% carbon.
 - (2) Blister copper has blistered appearance due to evolution of CO₂.
 - (3) Vapour phase refining is carried out for Nickel by Van Arkel method.
 - (4) Pig iron can be moulded into a variety of shapes.
- **112.** A tertiary butyl carbocation is more stable than a secondary butyl carbocation because of which of the following ?
 - (1) $-I \text{ effect of } -CH_3 \text{ groups}$
 - (2) + R effect of CH_3 groups
 - (3) $-R \text{ effect of } -CH_3 \text{ groups}$
 - (4) Hyperconjugation
- 113. Which of the following is a cationic detergent?
 - (1) Sodium lauryl sulphate
 - (2) Sodium stearate
 - (3) Cetyltrimethyl ammonium bromide
 - (4) Sodium dodecylbenzene sulphonate

- **114.** Elimination reaction of 2-Bromo-pentane to form pent-2-ene is :
 - (a) β -Elimination reaction
 - (b) Follows Zaitsev rule
 - (c) Dehydrohalogenation reaction
 - (d) Dehydration reaction
 - (1) (a), (b), (c)
 - (2) (a), (c), (d)
 - (3) (b), (c), (d)
 - (4) (a), (b), (d)
- **115.** The mixture which shows positive deviation from Raoult's law is :
 - (1) Ethanol + Acetone
 - (2) Benzene + Toluene
 - (3) Acetone + Chloroform
 - (4) Chloroethane + Bromoethane
- **116.** Which of the following is the **correct** order of increasing field strength of ligands to form coordination compounds?
 - (1) $SCN^- < F^- < C_2 O_4^{2-} < CN^-$
 - (2) $SCN^- < F^- < CN^- < C_2O_4^{2-}$
 - (3) $F^- < SCN^- < C_2 O_4^{2-} < CN^-$
 - (4) $CN^- < C_2 O_4^{2-} < SCN^- < F^-$
- **117.** Which of the following is a basic amino acid ?
 - (1) Serine
 - (2) Alanine
 - (3) Tyrosine
 - (4) Lysine
- - (1) Both $MgCl_2$ and $CaCl_2$
 - (2) Only NaCl
 - (3) Only MgCl₂
 - (4) NaCl, $MgCl_2$ and $CaCl_2$
- 119. Which of the following is a natural polymer?
 - (1) *cis*-1,4-polyisoprene
 - (2) poly (Butadiene-styrene)
 - (3) polybutadiene
 - (4) poly (Butadiene-acrylonitrile)

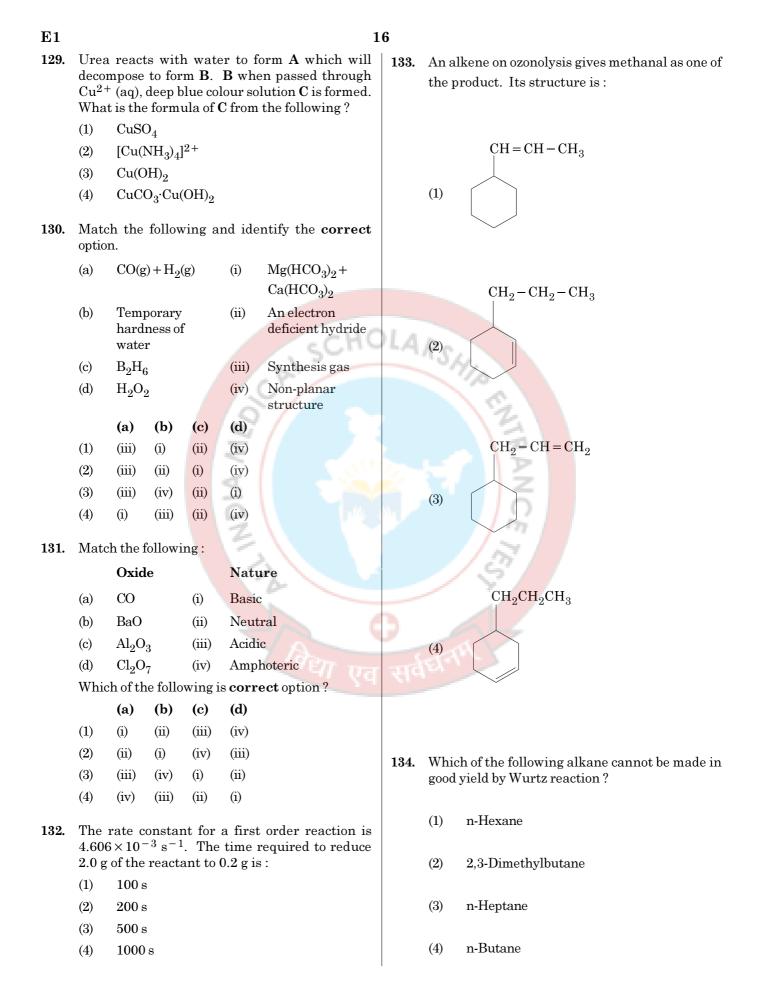
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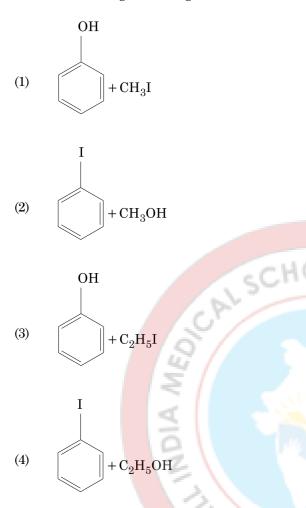
- **120.** Which of the following is **not** correct about carbon monoxide ?
 - (1) It forms carboxyhaemoglobin.
 - (2) It reduces oxygen carrying ability of blood.
 - (3) The carboxyhaemoglobin (haemoglobin bound to CO) is less stable than oxyhaemoglobin.
 - (4) It is produced due to incomplete combustion.
- 121. Sucrose on hydrolysis gives :
 - (1) β -D-Glucose + α -D-Fructose
 - (2) α -D-Glucose + β -D-Glucose
 - (3) α -D-Glucose + β -D-Fructose
 - (4) α -D-Fructose + β -D-Fructose
- 122. The following metal ion activates many enzymes, participates in the oxidation of glucose to produce ATP and with Na, is responsible for the transmission of nerve signals.
 - (1) Iron
 - (2) Copper
 - (3) Calcium
 - (4) Potassium
- **123.** Which one of the followings has maximum number of atoms ?
 - (1) $1 \operatorname{g} \operatorname{of} \operatorname{Ag}(s)$ [Atomic mass of Ag = 108]
 - (2) $1 \operatorname{g} \operatorname{of} \operatorname{Mg}(s)$ [Atomic mass of $\operatorname{Mg} = 24$]
 - (3) $1 \operatorname{g} \operatorname{of} O_2(g)$ [Atomic mass of O = 16]
 - (4) 1 g of Li(s) [Atomic mass of Li = 7]
- 124. The number of protons, neutrons and electrons in ${}^{175}_{71}$ Lu, respectively, are :
 - $(1) \qquad 71,\,104\,and\,71$
 - (2) 104, 71 and 71
 - (3) 71, 71 and 104
 - $(4) \qquad 175,\,104\,\text{and}\,71$

- **125.** What is the change in oxidation number of carbon in the following reaction ?
 - $\mathrm{CH}_4(\mathbf{g}) + 4\mathrm{Cl}_2(\mathbf{g}) \longrightarrow \mathrm{CCl}_4(\mathbf{l}) + 4\mathrm{HCl}(\mathbf{g})$
 - (1) +4 to +4
 - (2) 0 to + 4
 - (3) -4 to +4
 - (4) 0 to -4
- **126.** Identify the **incorrect** statement.
 - (1) $Cr^{2+}(d^4)$ is a stronger reducing agent than $Fe^{2+}(d^6)$ in water.
 - 2) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.
 - (3) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.
 - (4) The oxidation states of chromium in CrO_4^{2-}

and $Cr_2O_7^{2-}$ are not the same.

- 127. For the reaction, $2Cl(g) \rightarrow Cl_2(g)$, the correct option is:
 - (1) $\Delta_{\rm r} {\rm H} > 0$ and $\Delta_{\rm r} {\rm S} > 0$
 - (2) $\Delta_r H > 0$ and $\Delta_r S < 0$
 - (3) $\Delta_r H < 0 \text{ and } \Delta_r S > 0$
 - (4) $\Delta_r H \leq 0$ and $\Delta_r S \leq 0$
- **128.** Measuring Zeta potential is useful in determining which property of colloidal solution ?
 - (1) Viscosity
 - (2) Solubility
 - (3) Stability of the colloidal particles
 - (4) Size of the colloidal particles





- **136.** For which one of the following, Bohr model is **not** valid ?
 - (1) Hydrogen atom
 - (2) Singly ionised helium atom (He^+)
 - (3) Deuteron atom
 - (4) Singly ionised neon atom (Ne^+)
- 137. The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is : (c = speed of electromagnetic waves)
 - (1) c:1
 - (2) 1:1
 - (3) 1 : c
 - (4) $1:c^2$

138. The Brewsters angle i_b for an interface should be :

- (1) $0^{\circ} < i_b < 30^{\circ}$
- (2) $30^{\circ} < \dot{i}_b < 45^{\circ}$
- (3) $45^{\circ} < \dot{i_b} < 90^{\circ}$
- (4) $i_b = 90^{\circ}$

139. A cylinder contains hydrogen gas at pressure of 249 kPa and temperature 27°C.

Its density is : $(R = 8.3 \text{ J mol}^{-1} \text{ K}^{-1})$

- (1) 0.5 kg/m^3
- (2) 0.2 kg/m^3
- (3) 0.1 kg/m³
- (4) 0.02 kg/m^3
- 140. A ray is incident at an angle of incidence *i* on one surface of a small angle prism (with angle of prism A) and emerges normally from the opposite surface. If the refractive index of the material of the prism is μ, then the angle of incidence is nearly equal



- 141. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is :
 - (1) isothermal
 - (2) adiabatic
 - (3) isochoric
 - (4) isobaric

142. The energy equivalent of 0.5 g of a substance is :

- (1) $4.5 \times 10^{16} \,\mathrm{J}$
- (2) $4.5 \times 10^{13} \,\mathrm{J}$
- (3) $1.5 \times 10^{13} \,\mathrm{J}$
- (4) $0.5 \times 10^{13} \,\mathrm{J}$
- 143. A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth ?
 - (1) 48 N
 - (2) 32 N
 - (3) 30 N
 - (4) 24 N

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144. The solids which have the negative temperature coefficient of resistance are :

- (1) metals
- (2) insulators only
- (3) semiconductors only
- (4) insulators and semiconductors
- **145.** The phase difference between displacement and acceleration of a particle in a simple harmonic motion is :
 - (1) π rad
 - (2) $\frac{3\pi}{2}$ rad
 - (3) $\frac{\pi}{2}$ rad
 - (4) zero
- **146.** A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.

The pitch of the screw gauge is :

- (1) 0.01 mm
- (2) 0.25 mm
- (3) 0.5 mm
- (4) 1.0 mm
- 147. In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be :
 - (1) 523 Hz
 - $(2) \qquad 524\,\mathrm{Hz}$
 - (3) 536 Hz
 - (4) 537 Hz
- 148. Two particles of mass 5 kg and 10 kg respectively are attached to the two ends of a rigid rod of length 1 m with negligible mass.

The centre of mass of the system from the 5 kg particle is nearly at a distance of :

- (1) 33 cm
- (2) 50 cm
- (3) 67 cm
- (4) 80 cm

- 149. Find the torque about the origin when a force of 3j N acts on a particle whose position vector is 2k m.
 - (1) $6\hat{i}$ N m
 - (2) $6\dot{j}$ N m
 - (3) $-6\hat{i}$ N m
 - (4) $6\hat{k}$ N m
- 150. Light with an average flux of 20 W/cm² falls on a non-reflecting surface at normal incidence having surface area 20 cm². The energy received by the surface during time span of 1 minute is :
 - (1) $10 \times 10^3 \,\mathrm{J}$
 - (2) $12 \times 10^3 \,\mathrm{J}$
 - (3) $24 \times 10^3 \,\mathrm{J}$
 - (4) $48 \times 10^3 \,\mathrm{J}$
- 151. A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere ?

$$\left(\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2\right)$$
(1) 1.28 × 10⁴ N/C
(2) 1.28 × 10⁵ N/C
(3) 1.28 × 10⁶ N/C
(4) 1.28 × 10⁷ N/C

- (4) 1.28×10^{7} N/C
- **152.** In a certain region of space with volume 0.2 m³, the electric potential is found to be 5 V throughout. The magnitude of electric field in this region is :
 - (1) zero
 - (2) 0.5 N/C
 - (3) 1 N/C
 - (4) 5 N/C
- **153.** The increase in the width of the depletion region in a p-n junction diode is due to :
 - (1) forward bias only
 - (2) reverse bias only
 - (3) both forward bias and reverse bias
 - (4) increase in forward current

- 154. A 40 μ F capacitor is connected to a 200 V, 50 Hz ac supply. The rms value of the current in the circuit is, nearly :
 - (1) 1.7 A
 - (2) 2.05 A
 - (3) 2.5 A
 - (4) 25.1 A
- **155.** The mean free path for a gas, with molecular diameter d and number density n can be expressed as :
 - (1) $\frac{1}{\sqrt{2} \ n\pi d}$ (2) $\frac{1}{\sqrt{2} \ n\pi d^2}$
 - (3) $\frac{1}{\sqrt{2} n^2 \pi d^2}$
 - $(4) \qquad \overline{\sqrt{2} \ \mathrm{n}^2 \mathrm{\pi}^2 \mathrm{d}^2}$

156. For transistor action, which of the following statements is **correct**?

- (1) Base, emitter and collector regions should have same doping concentrations.
- (2) Base, emitter and collector regions should have same size.
- (3) Both emitter junction as well as the collector junction are forward biased.
- (4) The base region must be very thin and lightly doped.
- 157. Light of frequency 1.5 times the threshold frequency is incident on a photosensitive material. What will be the photoelectric current if the frequency is halved and intensity is doubled ?
 - (1) doubled
 - (2) four times
 - (3) one-fourth
 - (4) zero
- 158. When a uranium isotope $^{235}_{92}$ U is bombarded with a neutron, it generates $^{89}_{36}$ Kr, three neutrons and :
 - (1) $^{144}_{56}$ Ba
 - (2) ${}^{91}_{40}$ Zr
 - (3) $\frac{101}{36}$ Kr
 - (4) ${}^{103}_{36}$ Kr

- **159.** The energy required to break one bond in DNA is 10^{-20} J. This value in eV is nearly :
 - (1) 6
 - (2) 0.6
 - (3) 0.06
 - (4) 0.006

4 kg

(1)

(2)

(3)

(4)

g g/2

g/5

g/10

160. Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is :

6 kg

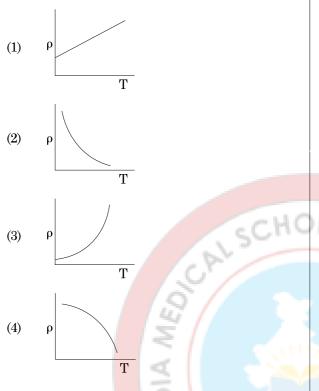
161. A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changes to L_1 when mass M is suspended from its free end. The expression for Young's modulus is :

(1)
$$\frac{MgL_{1}}{AL}$$
(2)
$$\frac{Mg(L_{1} - L)}{AL}$$
(3)
$$\frac{MgL}{AL_{1}}$$
(4)
$$\frac{MgL}{A(L_{1} - L)}$$

- 162. The average thermal energy for a mono-atomic gas is : (k_B is Boltzmann constant and T, absolute temperature)
 - (1) $\frac{1}{2} k_{B}T$ (2) $\frac{3}{2} k_{B}T$ (3) $\frac{5}{2} k_{B}T$ (4) $\frac{7}{2} k_{B}T$

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163. Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper ?



164. The color code of a resistance is given below :



The values of resistance and tolerance, respectively, are :

- (1) $470 \text{ k}\Omega, 5\%$
- (2) $47 \text{ k}\Omega, 10\%$
- (3) $4.7 \text{ k}\Omega, 5\%$
- (4) 470 Ω , 5%
- **165.** In Young's double slit experiment, if the separation between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes :
 - (1) double
 - (2) half
 - (3) four times
 - (4) one-fourth

166. The capacitance of a parallel plate capacitor with air as medium is $6 \ \mu F$. With the introduction of a dielectric medium, the capacitance becomes $30 \ \mu F$. The permittivity of the medium is :

$$(\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2})$$

- (1) $0.44 \times 10^{-13} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- (2) $1.77 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- (3) $0.44 \times 10^{-10} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- (4) $5.00 \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- 167. Dimensions of stress are :
 - (1) $[MLT^{-2}]$

20

- (2) $[ML^2T^{-2}]$
- (3) $[ML^0T^{-2}]$
- (4) $[ML^{-1}T^{-2}]$
- 168. Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is :
 - (1) 3.66×10^{-7} rad
 - (2) 1.83×10^{-7} rad
 - (3) $7.32 \times 10^{-7} \,\mathrm{rad}$
 - (4) $6.00 \times 10^{-7} \,\mathrm{rad}$
- 169. A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is π/3. If instead C is removed from the circuit, the phase difference is again π/3 between current and voltage. The power factor of the circuit is :
 - (1) zero
 (2) 0.5
 - (3) 1.0
 - (4) -1.0
- 170. A short electric dipole has a dipole moment of 16×10^{-9} C m. The electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of 60° with the dipole axis is :

$$\begin{pmatrix} \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2 \end{pmatrix}$$
(1) 50 V
(2) 200 V
(3) 400 V
(4) zero

- 171. An iron rod of susceptibility 599 is subjected to a magnetising field of 1200 A m⁻¹. The permeability of the material of the rod is :
 - $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$
 - (1) $2.4\pi \times 10^{-4} \text{ T m A}^{-1}$
 - (2) $8.0 \times 10^{-5} \,\mathrm{T \ m \ A^{-1}}$
 - (3) $2.4\pi \times 10^{-5} \text{ T m A}^{-1}$
 - (4) $2.4\pi \times 10^{-7} \text{ T m A}^{-1}$
- **172.** A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is :
 - $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$
 - (1) $6.28 \times 10^{-4} \,\mathrm{T}$
 - (2) $3.14 \times 10^{-4} \,\mathrm{T}$
 - (3) $6.28 \times 10^{-5} \,\mathrm{T}$
 - (4) $3.14 \times 10^{-5} \,\mathrm{T}$
- 173. A charged particle having drift velocity of 7.5×10⁻⁴ m s⁻¹ in an electric field of 3×10⁻¹⁰ Vm⁻¹, has a mobility in m² V⁻¹ s⁻¹ of:
 - (1) 2.25×10^{15}
 - (2) 2.5×10^6
 - (3) 2.5×10^{-6}
 - (4) 2.25×10^{-15}
- 174. The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5 r_2$) through 1 K are in the ratio :
 - (1) $\frac{27}{8}$
 - $(2) \qquad \frac{9}{4}$ $(3) \qquad \frac{3}{2}$
 - (4) $\frac{5}{3}$
- 175. An electron is accelerated from rest through a potential difference of V volt. If the de Broglie wavelength of the electron is 1.227×10^{-2} nm, the potential difference is :
 - (1) 10 V
 - (2) 10² V
 - (3) 10³ V
 - (4) $10^4 V$
- **176.** Taking into account of the significant figures, what is the value of 9.99 m 0.0099 m?
 - (1) 9.9801 m
 - (2) 9.98 m
 - (3) 9.980 m
 - (4) 9.9 m

- 177. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is : $(g = 10 \text{ m/s}^2)$
 - (1) 360 m
 - (2) 340 m
 (3) 320 m
 - (3) 320 m(4) 300 m
- 178. A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of the water in the capillary is 5 g. Another capillary tube of radius 2r is immersed in water. The mass of water that will rise in this tube is :
 - (1) 2.5 g
 - (2) 5.0 g
 - (3) 10.0 g
 - (4) 20.0 g
- **179.** A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is :
 - (1) $1.0 \times 10^{-2} \text{ m}$
 - (1) $1.0 \times 10^{-1} \text{ m}$ (2) $1.0 \times 10^{-1} \text{ m}$ (3) $1.5 \times 10^{-1} \text{ m}$
 - (4) $1.5 \times 10^{-2} \text{ m}$

180. For the logic circuit shown, the truth table is :

		177		
A -	\rightarrow	·O		
	1	<u>~</u>		—Y
		2 /		I
В —	\rightarrow	·O		
(1)	A	В	Y	
	0	0	0	
	0	1	0	
	1	0	0	
	1	1	1	
(2)	A 0	В	Y	
		0	0	
	0	1	1	
	1	0	1	
	1	1	1	
(3)	А	В	Υ	
	0	0	1	
	0	1	1	
	1	0	1	
	1	1	0	
(4)	А	В	Υ	
	0	0	1	
	0	1	0	
	1	0	0	
	1	1	0	
			• 0 •	
			- o 0 o -	

22 Space For Rough Work



23 Space For Rough Work



24 Space For Rough Work



Test Booklet Code

KANHA

No. :



This Booklet contains 24 pages.

Do not open this Test Booklet until you are asked to do so.

Important Instructions :

- 1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on **side-1** and **side-2** carefully with **blue/black** ball point pen only.
- 2. The test is of **3 hours** duration and Test Booklet contains **180** questions. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. The maximum marks are **720**.
- 3. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/marking responses.
- 4. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
- 5. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
- 6. The CODE for this Booklet is **F1**. Make sure that the CODE printed on Side-2 of the Answer Sheet is the same as that on this Test Booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
- 7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/ Answer Sheet.
- 8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
- 9. Each candidate must show on demand his/her Admit Card to the Invigilator.
- 10. No candidate, without special permission of the Superintendent or Invigilator, would leave his/her seat.
- 11. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet twice. Cases where a candidate has not signed the Attendance Sheet second time will be deemed not to have handed over the Answer Sheet and dealt with as an unfair means case.
- 12. Use of Electronic/Manual Calculator is prohibited.
- 13. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
- 14. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
- 15. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

 Name of the Candidate (in Capitals) :

 Roll Number
 : in figures

 : in words

 Centre of Examination (in Capitals) :

 Candidate's Signature :

 Facsimile signature stamp of

 Centre Superintendent :

F1		2	2							
1.		ight reaction, plastoquinone facilitates the sfer of electrons from :	6.			collowir unction		cerning essential elements lants :		
	(1)	PS-I to NADP+		(a)	Iron		(i)	Photolysis of water		
	(2)	PS-I to ATP synthase		(b)	Zinc		(ii)	Pollen germination		
	(3)	PS-II to Cytb ₆ f complex		(c)	Boro	n	(iii)	Required for chlorophyll biosynthesis		
	(4)	Cytb ₆ f complex to PS-I		(d)	Man	ganese	(iv)	IAA biosynthesis		
2.		sequence that controls the copy number of the ed DNA in the vector, is termed :		. ,			. ,	-		
	(1)	Palindromic sequence			(a)	(b)	(c)	(d)		
	(2)	Recognition site		(1)	(iii)	(iv)	(ii)	(i)		
	(3)	Selectable marker		(2)	(iv)	(i)	(ii)	(iii)		
	(4)	Ori site		(3)	(ii)	(i)	(iv)	(iii)		
		CHO	LA	(4)	(iv)	(iii)	(ii)	(i)		
3.		specific palindromic sequence which is gnized by EcoRI is :	_	πs,	42					
	(1)	5' - CTTAAG - 3'	7.					eparated DNA fragments he help of :		
		3' - GAATTC - 5'		(1)	Acet	ocarmi	ne in	UV radiation		
	(2)	5' - GGATCC - 3'		(2)	Ethi	dium b	romid	e in infrared radiation		
		3' - CCTAG <mark>G - 5</mark> '	10-	(3)	Acet	ocarmi	ne in	bright blue light		
	(3)	5' - GAATT <mark>C - 3</mark> ' ≤	2	(4)		100		e in UV radiation		
		3' - CTTAA <mark>G - 5</mark> '	84 / ·			12				
	(4)	5' - GGAAC <mark>C - 3'</mark>	8.	Name the enzyme that facilitates opening of D helix during transcription.						
		3' - CCTTGG - 5'		(1) DNA polymerase						
4.		tify the wrong statement with reference to unity.		(2)		polym				
	(1)	Active immunity is quick and gives full	D	(3) DNA ligase						
		response.		(4) DNA helicase						
	(2)	Foetus receives some antibodies from mother, it is an example for passive	9.	Inw	hich of	the fol	lowing	g techniques, the embryos		
		immunity.			ransfe eive ?	rred to	assist	those females who cannot		
	(3)	When exposed to antigen (living or dead) antibodies are produced in the host's body.		(1)		and Z	[FT			
		It is called "Active immunity".		(2)	GIF'	Г and I	CSI			
	(4)	When ready-made antibodies are directly given, it is called "Passive immunity".		(3)	ZIF	and I	UT			
		given, it is called a assive initiality.		(4)) GIFT and ZIFT					
5.		erimental verification of the chromosomal ry of inheritance was done by :	10.	Iden	tify th	e basic	amino	acid from the following.		
	(1)	Boveri		(1)	Lysi	ne				
	(2)	Morgan		(2)	Valii	ne				
	(3)	Mendel		(3)	Tyro	sine				
	(4)	Sutton		(4)	Glut	amic A	cid			

- **11.** Identify the **wrong** statement with reference to transport of oxygen.
 - (1) Higher H⁺ conc. in alveoli favours the formation of oxyhaemoglobin.
 - (2) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin.
 - (3) Binding of oxygen with haemoglobin is mainly related to partial pressure of O₂.
 - (4) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.
- 12. Floridean starch has structure similar to :
 - (1) Mannitol and algin
 - (2) Laminarin and cellulose
 - (3) Starch and cellulose
 - (4) Amylopectin and glycogen
- 13. By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams ?
 - (1) Cross breeding
 - (2) Inbreeding

(a)

(d)

- (3) Out crossing
- (4) Mutational breeding
- 14. Match the following columns and select the correct option.
 - Column IColumn IIPituitary gland(i)Grave's disease
 - (b) Thyroid gland (ii) Diabetes mellitus
 - (c) Adrenal gland (iii) Diabetes insipidus
 - Pancreas (iv) Addison's disease
 - (a) **(b)** (c) (d) (1)(iii) (i) (iv) (ii) (2)(ii) (i) (iv) (iii) (3)(iv) (iii) (i) (ii)
 - (4) (iii) (ii) (i) (iv)
- **15.** Select the option including all sexually transmitted diseases.
 - (1) AIDS, Malaria, Filaria
 - (2) Cancer, AIDS, Syphilis
 - (3) Gonorrhoea, Syphilis, Genital herpes
 - (4) Gonorrhoea, Malaria, Genital herpes

16. Choose the **correct** pair from the following :

(1)	Nucleases -	Separate the two strands of DNA
(2)	Exonucleases -	Make cuts at specific positions within DNA
(3)	Ligases -	Join the two DNA molecules
(4)	Polymerases -	Break the DNA into fragments

17. Ray florets have :

- (1) Hypogynous ovary
- (2) Half inferior ovary
- (3) Inferior ovary
- (4) Superior ovary
- 18. Match the organism with its use in biotechnology.
 - (a) Bacillus (i) Cloning vector thuringiensis
 - (b) Thermus (ii) Construction of aquaticus first rDNA
 - (c) Agrobacterium (iii) DNA polymerase tumefaciens

molecule

(d) Salmonella (iv) Cry proteins typhimurium

Select the correct option from the following :

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(iv)	(i)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(ii)	(iv)	(iii)	(i)
(4)	(iv)	(iii)	(i)	(ii)

19. The product(s) of reaction catalyzed by nitrogenase in root nodules of leguminous plants is/are :

- (1) Ammonia and oxygen
- (2) Ammonia and hydrogen
- (3) Ammonia alone
- (4) Nitrate alone

F1		4	1							
20.		the plant growth regulator which upon ying on sugarcane crop, increases the length	25.	Match the following columns and select the correct option.						
		em, thus increasing the yield of sugarcane		COTT	Column - I Column - II					
	crop			(a)	Floating Ribs (i) Located between	L				
	(1)	Ethylene			second and seventh ribs					
	(2)	Abscisic acid		(b)	Acromion (ii) Head of the					
	(3)	Cytokinin			Humerus					
	(4)	Gibberellin		(c)	Scapula (iii) Clavicle					
	(-/			(d)	Glenoid cavity (iv) Do not connect with the sternur	m				
21.	The	body of the ovule is fused within the funicle			(a) (b) (c) (d)	11				
	at :			(1) (2)	(iii) (ii) (iv) (i) (iv) (iii) (i) (ii)					
	(1)	Nucellus		(2) (3)	$\begin{array}{cccc} (iv) & (iii) & (ii) & (iii) \\ (ii) & (iv) & (i) & (iii) \\ \end{array}$					
	(2)	Nucellus Chalaza Hilum Micropyle	LA	(4)	(i) (iii) (ii) (iv)					
			26.		tify the wrong statement with regard t	0				
	(3)	Hilum		Resti (1)	riction Enzymes. They are useful in genetic engineering.					
	(4)	Micropyle		(1) (2)	Sticky ends can be joined by using DN	А				
				(3)	ligases. Each restriction enzyme functions b	v				
22.	The	process of growth is maximum during :	17-		inspecting the length of a DNA sequence.					
	(1)	Senescence	-	(4)	They cut the strand of DNA at palindrom: sites.	lC				
	(2)	Dormancy 9	27.		ch the followi <mark>ng c</mark> olumns and select th	e				
				corr	ect option. Column - I Column - II					
	(3)	Log phase		(a)	Gregarious, polyphagous (i) Asterias					
	(4)	Lag phase		(b)	pest Adult with radial (ii) Scorpion					
				(0)	symmetry and larva					
23.		terally symmetrical and accelomate animals xemplified by :	/	(c)	with bilateral symmetry Book lungs (iii) Ctenoplan	a				
		्रथा एव	चार्व	(d)	Bioluminescence (iv) Locusta	a				
	(1)	Aschelminthes		(1)	(a) (b) (c) (d) (iii) (ii) (i) (iv)					
	(2)	Annelida		(2)	(ii) (i) (iii) (iv)					
	(3)	Ctenophora		(3) (4)	(i) (iii) (ii) (iv) (iv) (i) (ii) (iii)					
	(4)	Platyhelminthes	28.		e head of cockroach is removed, it may live fo	or				
				few d (1)	lays because : the head holds a small proportion of a nervou	ıs				
24.		ch of the following is put into Anaerobic sludge			system while the rest is situated along th					
	dige	ster for further sewage treatment?		(2)	ventral part of its body. the head holds a 1/3 rd of a nervous system	n				
	(1)	Effluents of primary treatment			while the rest is situated along the dorsa					
	(2)	Activated sludge		(3)	part of its body. the supra-oesophageal ganglia of th	e				
	(3)	Primary sludge			cockroach are situated in ventral part of abdomen.	of				
				(4)	the cockroach does not have nervous system	ı.				
	(4)	Floating debris								

F1

		ن					гі				
29.		ch of the following regions of the globe exhibits est species diversity ?	35.		idal epitheliu ınd in :	ım witł	n brush border of microvilli				
	(1)	Himalayas		(1)	proximal co	nvolut	ted tubule of nephron				
	(2)	Amazon forests		(2)	eustachian tube						
	(3)	Western Ghats of India		(3)							
	(4)	Madagascar		(4)	ducts of sal						
30.		ch is the important site of formation of oproteins and glycolipids in eukaryotic cells?	90	Mata							
	(1)	Golgi bodies	36.	Mate	Match the following with respect to meiosis :						
	(2)	Polysomes		(a)	Zygotene	(i)	Terminalization				
	(3)	Endoplasmic reticulum		(b)	Pachytene	(ii)	Chiasmata				
	(4)	Peroxisomes	LA	(c)	Diplotene	(iii)	Crossing over				
31.	Whic algae	$\frac{1}{2}$ ch of the following pairs is of unicellular		(d)	Diakinesis	(iv)	Synapsis				
	(1)	Anabaena and Volvox		Selec	t the correc	t optic	on from the following :				
	(1)	Chlorella and Spirulina			(a) (b)	(c)	(d)				
	(2)	Laminaria and Sargassum		(1)	(i) (ii)	(iv)	(iii)				
	(3)	Gelidium and Gracilaria	17-	(2)	(ii) (iv)	(iii)	(i)				
	(4)	Genatum and Gracitaria	~	(3)	2		(ii)				
32.		ch one of the f <mark>ollo</mark> wing is the most abundant ein in the animals ?	y	(3)	(iii) (iv) (iv) (iii)	(i) (ii)	(i)				
	(1)	Lectin		55							
	(2)	Insulin	37.		Which of the following statements about inclusion						
	(3)	Haemoglobin		bodies is incorrect ?(1) They lie free in the cytoplasm.							
	(4)	Collagen		(1)							
			-	(2)	These represent reserve material in cytoplasm.						
33.	Disso durii	olution of the synaptonemal complex occurs	49		-	. 1					
		Diplotene		(3)	-		nd by any membrane.				
	(1) (2)	Leptotene		(4)	These are particles.	involv	ved in ingestion of food				
	(2)	Pachytene			pur tiolos.						
	(3) (4)	Zygotene	38.	Whic	h of the follow	wing w	ould help in prevention of				
	(4)	Zygotene		diure	esis?						
34.	Mene	many true breeding pea plant varieties did del select as pairs, which were similar except le character with contrasting traits ?		(1)	vasoconstri						
	(1)	14		(2)	$\label{eq:constraint} Decrease in secretion of renin by JG cells$						
	(1) (2)	8		(3)	More wa undersecre		ceabsorption due to ADH				
	(3)	4		(4)	Reabsorpti	on of N	$\operatorname{Ia^+}$ and water from renal				
	(4)	2		\ - /	tubules due						

F1						(6							
39.			erse se l featui		of a pla	ant shows following	43.					•	cuBisCo enzyme in ormation of :	
	(a)					ed vascular bundles		(1)	1 mo	lecule	of 6-C	compo	und	
	(b)		e cons	U U	ındle sl s parer	neatn. nchymatous ground		(2)		lecule C comp		compo	und and 1 molecule	
	(c)			undlog	conioi	nt and closed.		(3)	(3) 2 molecules of 3-C compound					
	(c) (d)				ma ab			(4)	1 mo	lecule	of 3-C	compo	und	
			-	-		and its part :								
	(1)	-	tyledor	-	-	and its part.	44.	The infectious stage of <i>Plasmodium</i> that enters the human body is :						
	(1) (2)		tyledor					(1)		-		tog		
			-					 Female gametocytes Male gametocytes 						
	(3) (4)	(3) Monocotyledonous stem(4) Monocotyledonous root					-	-	3					
	(4)	WIOII	ocotyle	uonou	S1001			(3)		hozoite	s			
40.	Whi	ch of th	ne follo	wings	statem	ents is correct ?	11.4	(4)	Spor	ozoites				
	(1)						LA	R.C.	\sim					
		H-bonds.			45.	Iden	tify the	e inco	crect s	statem	ent.			
	(2)				1 A 10	ith thymine.		(1)					st secondary xylem	
	(3)	Adenine pairs with thymine through two H-bonds.			(2)	and i Due	nins, resins, oils etc.,							
	(4) Adenine pairs with thymine through one					t wood								
		H-bo			2		20	(3)		t wood nanical			duct water but gives	
41.		Match the following columns and select the correct option.							(4) Sapwood is involved in conduction					
	corr				0		4/	(1)					to leaf.	
		Colı	ımn -	I	Z	Column - II								
	(a)	Bt co	otton		(i)	Gene therapy	46.	Which of the following is correct about viro				ect about viroids ?		
	(b)	Ader	nosine		(ii)	Cellular defence		(1) They have DNA with protein coat.						
		dean	ninase					(2)	thout protein coat.					
		defic	iency				B.	(3)	They	<mark>have</mark>	RNA v	vith pr	otein coat.	
	(c)	RNA	i		(iii)	Detection of HIV	_	(4)	They	NA wit	hout protein coat.			
						infection	310							
	(d)	PCR			(iv)	Bacillus	47.						with the causative	
						thuringiensis		orga				corre	ect option.	
		(a)	(b)	(c)	(d)				Colu	1mn - 1	[Column - II	
	(1)	(ii)	(iii)	(iv)	(i)			(a)	Typh	oid		(i)	Wuchereria	
	(2)	(i)	(ii)	(iii)	(iv)			(b)	Pneu	imonia		(ii)	Plasmodium	
	(3)	(iv)	(i)	(ii)	(iii)			(c)	Filar	iacie		(iii)	Salmonella	
	(4)	(iii)	(ii)	(i)	(iv)									
42.	Flip	pers of	Pengu	uins ar	nd Dolr	ohins are examples		(d)	Mala			(iv)	Haemophilus	
	of:		8-					(-)	(a)	(b)	(c)	(d)		
	(1)	Indu	strial	melani	ism			(1)	(ii)	(i)	(iii)	(iv)		
	(2)	Natı	ural sel	ection				(2)	(iv)	(i)	(ii)	(iii)		
	(3)	Adap	otive ra	diatio	n			(3)	(i)	(iii)	(ii)	(iv)		
	(4)	Conv	vergent	t evolu	tion			(4)	(iii)	(iv)	(i)	(ii)		
							1							

			7		F1					
48.		tify the wrong statement with reference to gene 'I' that controls ABO blood groups.	54.		number of substrate level phosphorylations ne turn of citric acid cycle is :					
	(1)	When $I^{A}\text{and}I^{B}$ are present together, they		(1)	Two					
		express same type of sugar.		(2)	Three					
	(2)	Allele 'i' does not produce any sugar.		(3) Zero						
	(3)	The gene (I) has three alleles.		(4) One						
	(4)	A person will have only two of the three alleles.								
		alleles.	55.	Mate	ch the following :					
49.		ording to Robert May, the global species rsity is about :		(a)	Inhibitor of catalytic (i) Ricin activity					
	(1)	50 million		(b)	Possess peptide bonds (ii) Malonate					
	(2)	7 million		(c)	Cell wall material in (iii) Chitin					
	(3)	1.5 million	1.		fungi					
	(4)	20 million	ILA	(d)	Secondary metabolite (iv) Collagen					
50	XX71 ·			Choo	ose the correct option from the following :					
50.		ch of the following is not an attribute of a lation?		(1)	(a) (b) (c) (d)					
	(1)	Mortality		(1) (2)	(iii) (iv) (i) (ii) (ii) (iii) (i) (iv)					
	(2)	Species interaction		(2)	(ii) (iii) (iv) (iii) (i)					
	(3)	Sex ratio	17	(3)	(iii) (i) (iv) (ii)					
	(4)	Natality	-	(-)						
51.	place	ater hyacinth and water lily, pollination takes e by :	56.	56. Which of the following refer to correct exampled of organisms which have evolved due to chang in environment brought about by anthropogen action?						
	(1)	wind and water		(a) Darwin's Finches of Galapagos islands.						
	(2)	insects and water	-							
	(3)	insects or wind	D	(b) Herbicide resistant weeds.						
	(4)	water currents only	-	(c)	Drug resistant eukaryotes.					
52.	The	QRS complex in a standard ECG represents :	1540	(d)	Man-created breeds of domesticated animals					
	(1)	Depolarisation of ventricles			like dogs.					
	(2)	Repolarisation of ventricles		(1) (2)	(b), (c) and (d)					
	(3)	Repolarisation of auricles		(2) (3)	only (d) only (a)					
	(4)	Depolarisation of auricles		(3)	(a) and (c)					
F 9	Gala			(1)						
53.	(1)	ct the correct match. Sickle cell anaemia - Autosomal recessive trait, chromosome-11	57.	Some dividing cells exit the cell cycle and envegetative inactive stage. This is called quiesce stage (G_0). This process occurs at the end of :						
	(2)	Thalassemia - X linked		(1)	Sphase					
	(3)	Haemophilia - Y linked		(2)	G ₂ phase					
	(4)	Phenylketonuria - Autosomal		(3) (4)	M phase G phase					
		dominant trait		(4)	G ₁ phase					

$\mathbf{F1}$		8	3							
58.	and o	ndary metabolites such as nicotine, strychnine caffeine are produced by plants for their :	64.	In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is correct ?						
	(1)	Defence action		(1)	_					
	(2)	Effect on reproduction		(1)	Gross primary productivity and Net primary productivity are one and same.					
	(3)	Nutritive value		(2)	There is no relationship between Gross					
	(4)	Growth response		primary productivity and Net primary productivity.						
59.		otic division of the secondary oocyte is oleted:		(3)	Gross primary productivity is always less than net primary productivity.					
	(1)	After zygote formation		(4)	Gross primary productivity is always more					
	(2)	At the time of fusion of a sperm with an ovum			than net primary productivity.					
	(3)	Prior to ovulation	65.		h the trophic levels with their correct species ples in grassland ecosystem.					
	(4)	At the time of copulation	1.							
		SCHU	LĄ	(a)	Fourth trophic level (i) Crow					
60.		ch of the following statements is not		(b)	Second trophic level (ii) Vulture					
	(1)	rect ? The functional insulin has A and B chains		(c)	First trophic level (iii) Rabbit					
	linked together by hydrogen bonds.			(d)	Third trophic level (iv) Grass					
	(2)	Genetically engineered insulin is produced in <i>E-Coli</i> .		Selec	et the correct option : (a) (b) (c) (d)					
	(3)	In man in <mark>sul</mark> in is synthesised as a proinsulin.	2	(1)	(iv) (iii) (ii) (i)					
	(4)	The proinsulin has an extra peptide called C-peptide.		(2) (3)	(i) (ii) (iii) (iv) (ii) (iii) (iv) (i)					
61.	Snov	v-blindness in Antarctic region is due to :		(4)	(iii) (i) (i) (iv)					
01.	(1)	High reflection of light from snow	66. Select the correct statement.							
	. ,	Damage to retina caused by infra-red rays		(1) Insulin acts on pancreatic cells and						
	(3)	Freezing of fluids in the eye by low	/	adipocytes.						
		temperature	-	(2) Insulin is associated with hyperglycemia.						
	(4)	Inflammation of cornea due to high dose of UV-B radiation	1.1	(3)	(3) Glucocorticoids stimulate gluconeogenesis.					
		UV-D radiation		(4)	Glucagon is associated with hypoglycemia.					
62.	Strol	bili or cones are found in :	67.	Selec	et the correct events that occur during					
	(1)	Marchantia			ration.					
	(2)	Equisetum		(a)	Contraction of diaphragm					
	(3)	Salvinia		(b)	Contraction of external inter-costal muscles					
	(4)	Pteris								
63.		n his experiments, S.L. Miller produced amino s by mixing the following in a closed flask :		(c) (d)	Pulmonary volume decreases Intra pulmonary pressure increases					
	(1)	CH_4 , H_2 , NH_3 and water vapor at 600°C		(1)	(a), (b) and (d)					
	(1)	CH_4 , H_2 , NH_3 and water vapor at 600°C CH_3 , H_2 , NH_3 and water vapor at 600°C		(2)	only (d)					
	(3)	CH_4 , H_2 , NH_3 and water vapor at 800°C		(3)	(a) and (b)					
	(4)	CH_3 , H_2 , NH_4 and water vapor at 800°C		(4)	(c) and (d)					
	(-)			(-)						

n	
y	

The roots that originate from the base of the stem

are.			0011	occ op	01011.					
(1)	Prop roots			Colu	umn -	I		Column - II		
(2)	Lateral roots		(a)	Plac	enta		(i)	Androgens		
(3)	Fibrous roots		(b)	Zona	a pelluc	rida	(ii)	Human Chorionic		
(4)	Primary roots							Gonadotropin (hCG)		
from			(c)	Bulb glan	o-uretl ds	hral	(iii)	Layer of the ovum		
(1)	Chondrocytes		(d)	Leyd	lig cells	3	(iv)	Lubrication of the		
(2)	Compound epithelial cells							Penis		
(3)	Squamous epithelial cells			(a)	(b)	(c)	(d)			
(4)	Columnar epithelial cells		(1)	(iii)	(ii)	(iv)	(i)			
Mon	treal protocol was signed in 1987 for control	LA	(2)	(ii)	(iii)	(iv)	(i)			
of:	treat protocol was signed in 1387 for control		(3) (4)	(iv) (i)	(iii) (iv)	(i) (ii)	(ii) (iii)			
(1)	Release of Green House gases			1420			. ,			
(2)	Disposal of e-wastes	74.						nsecutive base pairs er of base pairs of a		
(3)	Transport of Genetically modified organisms							mammalian cell is		
<i>(</i> .)	from one country to another				op, the tely:		e leng	th of the DNA is		
(4)	Emission of ozone depleting substances	14	(1)		n <mark>eters</mark>					
Whie	ch of the following statements are true for		(2)	$2.7\mathrm{n}$	neters					
	hylum-Chord <mark>ata ?</mark>	9	(3)		neters					
(a)	In Urochordata notochord extends from		(4)	2.5 n	neters					
	head to tail and it is present throughout their life.	75.	75. The ovary is half inferior in :							
(b)	In Vertebrata notochord is present during	10.	(1)		lower	men	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
(0)	the embryonic period only.		(2)	<u>Plun</u>	n					
(c)	Central nervous system is dorsal and		(3)	Brin	100					
	hollow.		(4)	Mus	tard					
(d)	Chordata is divided into 3 subphyla :	76.	Idon	tify th		raat s	tatom	ent with regard to		
	Hemichordata, Tunicata and Cephalochordata.	70.			Gap 1)			U		
(1)	(a) and (b)		(1)		is meta eplicat			ive, grows but does		
(2)	(b) and (c)		(2)		lear Di			place.		
(3)	(d) and (c)		(3)					ation takes place.		
(4)	(c) and (a)		(4)	Reor place	0	ition of	fall cel	l components takes		
	tify the substances having glycosidic bond and ide bond, respectively in their structure :	77.	relea	ase of		-		ne levels will cause from the graffian		
(1)	Cellulose, lecithin		follic (1)		concer	tratio	noft	Т		
(2)	Inulin, insulin		(1) (2)		concer					
(3)	Chitin, cholesterol		(2) (3)					strogen		
$\langle A \rangle$	Classes 1 torrest		(4)	тт· 1		, <u>,</u> .	٢D	-		

(4)Glycerol, trypsin

68.

69.

70.

71.

are :

72.

73. Match the following columns and select the correct option.

(4)

 $High \ concentration \ of \ Progesterone$

$\mathbf{F1}$						1	0							
78.		-				nt with reference to	82.	The f	ïrst pł	nase of	trans	lation	is:	
		-	estive	-				(1)	Amir	noacyla	ation of	ftRNA	L	
	(1)				coiled	-		(2)	Reco	gnitior	nofan	anti-co	odon	
	(2)					ses from duodenum.		(3) Binding of mRNA to ribosome						
	(3)		-			ntestine.		(4) Recognition of DNA molecule						
	(4)		osa 1s entary			nost layer of the	83.	Embryological support for evolution wa						
		um	circary	cullul	•		00.		prove		suppo	5rt 10	r evolution was	
79.	Mat	ch the	follov	wing	colum	ns and select the		(1) Charles Darwin						
	corr	ect op	tion.	0				(2)	Opar	rin				
		Column - I Column - II				Column - II		(3)	Karl	Ernst	von Ba	aer		
	(a)	Eosii	nophils		(i)	Immune response		(4)	Alfre	d Wall	ace			
	(b)	Baso	phils		(ii)	Phagocytosis	84.	Mate	h the	follo	ving (olum	ns and select the	
	(c)	Neut	rophil	3	(iii)	Release	01.		ect op		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Jorum		
	. ,		-			histaminase,	LĄ	Pr	Colu	1mn - I	[Column - II	
						destructive		(a)	6 - 1	5 pairs	of	(i)	Trygon	
					1	enzymes		(4)	gill s		UT I	(1)	11,9010	
	(d)	Lym	phocyt	es	(iv)	Release granules		(b)	× (rocerca	1	(ii)	Cyclostomes	
					44	containing		(0)		al fin		(ш)	Cyclostonics	
					2	histamine				74		(:::)	Charadariah thana a	
		(a)	(b)	(c)	(d)		100	(c)		ladder		(iii)	Chondrichthyes	
	(1)	(i)	(ii)	(iv)	(iii)			(d)		on sting	-	(iv)	Osteichthyes	
	(2)	(ii)	(i)	(iii)	(iv)		24 J		(a)	(b)	(c)	(d)		
	(3)	(iii)	(iv)	(ii)	(i)			(1)	(iv)	(ii)	(iii)	(i)		
	(4)	(iv)	(i)	(ii)	(iii)			(2)	(i)	(iv)	(iii)	(ii)		
	m 1				N.			(3)	(ii)	(iii)	(iv)	(i)		
80.	-		arts w the otl		onsisto	of two generations -	(4) (iii) (iv) (i) (ii)							
	(a)				ide the	anther	85. Match the following columns and select the							
	(b)		-			in with two male	-	corre	ect op					
	(0)	game		u pon		in with two mate	स्ववे	Column - I Column					Column - II	
	(c)	-	inside	the fr	nit			(a)		tridiun	n	(i)	Cyclosporin-A	
	(d)				e the o				butyl	licum				
	(u) (1)		nd (d)	, msiu	e the o	vule		(b)		nodern		(ii)	Butyric Acid	
	(1) (2)		nd (d)						polys	sporum	ı			
	(3)	(a) or						(c)	Mon	ascus		(iii)	Citric Acid	
	(4)		b) and	(c)					purp	ureus				
								(d)	Aspe	rgillus	niger	(iv)	Blood cholesterol	
81.				-		developed by the cillus thuringiensis							lowering agent	
			stant to			cuus murmgiensis			(a)	(b)	(c)	(d)		
	(1)		t nema					(1)	(i)	(ii)	(iv)	(iii)		
	(2)	Insee	ct preda	ators				(2)	(iv)	(iii)	(ii)	(i)		
	(3)	Insee	ct pests	3				(3)	(iii)	(iv)	(ii)	(i)		
	(4)	Fung	gal dise	eases				(4)	(ii)	(i)	(iv)	(iii)		
							I							

91.

86. Which of the following is **not** an inhibitory substance governing seed dormancy?

- (1) Phenolic acid
- (2) Para-ascorbic acid
- (3) Gibberellic acid
- (4) Abscisic acid

88.

89.

90.

- 87. Match the following columns and select the **correct** option.
 - (2)Column - I Column - II zero $50\,\mathrm{V}$ (3)Organ of Corti Connects middle (a) (i) $200\,\mathrm{V}$ (4)ear and pharvnx (b) Cochlea Coiled part of the (ii) 92. A series LCR circuit is connected to an ac voltage labyrinth source. When L is removed from the circuit, the phase difference between current and voltage Attached to the (c) Eustachian tube (iii) . If instead C is removed from the circuit, oval window (d) Stapes (iv) Located on the the phase difference is again $\frac{\pi}{3}$ between current basilar and voltage. The power factor of the circuit is : membrane (1)1.0 (a) **(b)** (c) (d) -1.0(2)(1)(iv) (ii) (i) (iii) zero (3)(2)(i) (ii) (iv) (iii) (4)0.5(3)(ii) (iv) (iii) (i) 93. Light of frequency 1.5 times the threshold (ii)(4)(iii) (i) (iv) frequency is incident on a photosensitive material. What will be the photoelectric current if the The enzyme enterokinase helps in conversion of : frequency is halved and intensity is doubled? caseinogen into casein (1)(1)one-fourth (2)pepsinogen into pepsin (2)zero (3)protein into polypeptides doubled (3)(4)trypsinogen into trypsin (4)four times Presence of which of the following conditions in 94. Dimensions of stress are : urine are indicative of Diabetes Mellitus? $[ML^{0}T^{-2}]$ (1)Ketonuria and Glycosuria (1) $[ML^{-1}T^{-2}]$ (2)(2)Renal calculi and Hyperglycaemia $[MLT^{-2}]$ (3)(3)Uremia and Ketonuria $[ML^{2}T^{-2}]$ (4)(4)Uremia and Renal Calculi **95**. An electron is accelerated from rest through a The process responsible for facilitating loss of water potential difference of V volt. If the de Broglie in liquid form from the tip of grass blades at night wavelength of the electron is 1.227×10^{-2} nm, the and in early morning is : potential difference is : (1)Imbibition (1) $10^3 V$ (2)Plasmolysis $10^4\,\mathrm{V}$ (2)(3)Transpiration (3) $10\,\mathrm{V}$ (4)Root pressure (4) $10^{2} V$

A short electric dipole has a dipole moment of

 16×10^{-9} C m. The electric potential due to the

dipole at a point at a distance of 0.6 m from the

centre of the dipole, situated on a line making an

angle of 60° with the dipole axis is :

 $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2$

 $400\,\mathrm{V}$

(1)

- F1
- 96. The capacitance of a parallel plate capacitor with air as medium is $6 \ \mu F$. With the introduction of a dielectric medium, the capacitance becomes $30 \ \mu F$. The permittivity of the medium is :
 - $(\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2})$
 - (1) $0.44 \times 10^{-10} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - (2) $5.00 \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - (3) $0.44 \times 10^{-13} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - (4) $1.77 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
- **97.** The solids which have the negative temperature coefficient of resistance are :
 - (1) semiconductors only
 - (2) insulators and semiconductors
 - (3) metals
 - (4) insulators only
- **98.** For transistor action, which of the following statements is **correct**?
 - (1) Both emitter junction as well as the collector junction are forward biased.
 - (2) The base region must be very thin and lightly doped.
 - (3) Base, emitter and collector regions should have same doping concentrations.
 - (4) Base, emitter and collector regions should have same size.
- **99.** A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.

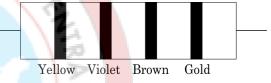
The pitch of the screw gauge is :

- (1) 0.5 mm
- (2) 1.0 mm
- (3) 0.01 mm
- $(4) \quad 0.25 \text{ mm}$
- **100.** The phase difference between displacement and acceleration of a particle in a simple harmonic motion is :
 - (1) $\frac{\pi}{2}$ rad
 - (2) zero
 - (3) π rad

(4)
$$\frac{3\pi}{2}$$
 rad

- **101.** A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is :
 - $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$
 - (1) $6.28 \times 10^{-5} \,\mathrm{T}$
 - (2) $3.14 \times 10^{-5} \text{ T}$ (3) $6.28 \times 10^{-4} \text{ T}$
 - (4) $3.14 \times 10^{-4} \,\mathrm{T}$
- 102. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is : $(g = 10 \text{ m/s}^2)$
 - (1) 320 m
 - (2) 300 m
 - (3) 360 m
 - (4) 340 m

103. The color code of a resistance is given below :



The values of resistance and tolerance, respectively,

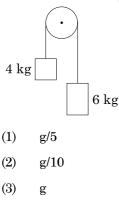
are :	
(1)	$4.7 \mathrm{k}\Omega, 5\%$
(2)	$470\Omega,5\%$
(3)	$470 \mathrm{k}\Omega, 5\%$
10	

- (4) 47 k Ω , 10%
- **104.** The Brewsters angle i_b for an interface should be :
 - (1) $45^{\circ} < i_b < 90^{\circ}$
 - (2) $i_b = 90^{\circ}$
 - (3) $0^{\circ} < i_b < 30^{\circ}$
 - (4) $30^{\circ} < i_b < 45^{\circ}$
- 105. A ray is incident at an angle of incidence *i* on one surface of a small angle prism (with angle of prism A) and emerges normally from the opposite surface. If the refractive index of the material of the prism is μ, then the angle of incidence is nearly equal to :
 - (1) μA (2) $\frac{\mu A}{2}$ (3) $\frac{A}{2\mu}$ (4) $\frac{2A}{\mu}$

SCHC

12

- 106. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is :
 - (1) isochoric
 - (2) isobaric
 - (3) isothermal
 - (4) adiabatic
- **107.** For which one of the following, Bohr model is **not** valid ?
 - (1) Deuteron atom
 - (2) Singly ionised neon atom (Ne^+)
 - (3) Hydrogen atom
 - (4) Singly ionised helium atom (He^+)
- 108. Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is :



- (4) g/2
- **109.** In a certain region of space with volume 0.2 m³, the electric potential is found to be 5 V throughout. The magnitude of electric field in this region is :
 - (1) 1 N/C
 - (2) 5 N/C
 - (3) zero
 - (4) 0.5 N/C

- 110. When a uranium isotope ${}^{235}_{92}$ U is bombarded with a neutron, it generates ${}^{89}_{36}$ Kr, three neutrons and :
 - (1) ${}^{101}_{36}$ Kr
 - (2) ${}^{103}_{36}$ Kr
 - (3) $^{144}_{56}$ Ba
 - (4) ${}^{91}_{40}$ Zr
- 111. The energy equivalent of $0.5 ext{ g of a substance is}$:
 - (1) $1.5 \times 10^{13} \,\mathrm{J}$
 - (2) $0.5 \times 10^{13} \,\mathrm{J}$
 - (3) $4.5 \times 10^{16} \text{ J}$
 - (4) $4.5 \times 10^{13} \,\mathrm{J}$
- 112. The mean free path for a gas, with molecular diameter d and number density n can be expressed as :

(1)
$$\frac{1}{\sqrt{2} n^2 \pi d^2}$$

(2) $\frac{1}{\sqrt{2} n^2 \pi^2 d^2}$
(3) $\frac{1}{\sqrt{2} n \pi d}$
(4) $\frac{1}{\sqrt{2} n \pi d^2}$

113. A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changes to L_1 when mass M is suspended from its free end. The expression for Young's modulus is :

(1)
$$\frac{\text{MgL}}{\text{AL}_{1}}$$
(2)
$$\frac{\text{MgL}}{\text{A}(\text{L}_{1} - \text{L})}$$
(3)
$$\frac{\text{MgL}_{1}}{\text{AL}}$$
(4)
$$\frac{\text{Mg}(\text{L}_{1} - \text{L})}{\text{AL}}$$

114. A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere ?

$$\begin{pmatrix} \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2 \\ (1) & 1.28 \times 10^6 \text{ N/C} \\ (2) & 1.28 \times 10^7 \text{ N/C} \\ (3) & 1.28 \times 10^4 \text{ N/C} \\ (4) & 1.28 \times 10^5 \text{ N/C} \\ \end{cases}$$

F1

 $\mathbf{F1}$

- 14
- **115.** The energy required to break one bond in DNA is 10^{-20} J. This value in eV is nearly :
 - (1) 0.06
 - (2) 0.006
 - (3) 6
 - (4) 0.6
- **116.** A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth ?
 - (1) 30 N
 - (2) 24 N
 - (3) 48 N
 - (4) 32 N
- 117. For the logic circuit shown, the truth table is :

		0			1.11
$\mathrm{A}-$	\neg	>0		SCHU	21
) >>Y	
$\mathrm{B}-$		>0			1
(1)	А	В	Y		
	0	0	1	S	
	0	1	1	15 C.M	1
	1	0	1		
	1	1	0		
(2)	А	В	Y	191 19	
	0	0	1	E	
	0	1	0		1
	1	0	0		-
	1	1	0		
(3)	А	В	Y		-
	0	0	0	AN I	7
	0	1	0		
	1	0	0		
	1	1	1		
(4)	А	В	Y		
	0	0	0		
	0	1	1		_
	1	0	1		1
	1	1	1		
					1

- **118.** In Young's double slit experiment, if the separation between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes :
 - (1) four times
 - (2) one-fourth
 - (3) double
 - (4) half

- 119. A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of the water in the capillary is 5 g. Another capillary tube of radius 2r is immersed in water. The mass of water that will rise in this tube is :
 - (1) 10.0 g
 - (2) 20.0 g
 - (3) 2.5 g
 - (4) 5.0 g
- **120.** A cylinder contains hydrogen gas at pressure of 249 kPa and temperature 27°C.

Its density is : $(R = 8.3 \text{ J mol}^{-1} \text{ K}^{-1})$

- (1) 0.1 kg/m^3
- (2) 0.02 kg/m^3
- (3) 0.5 kg/m^3
- (4) 0.2 kg/m^3
- 121. An iron rod of susceptibility 599 is subjected to a magnetising field of 1200 A m⁻¹. The permeability of the material of the rod is :

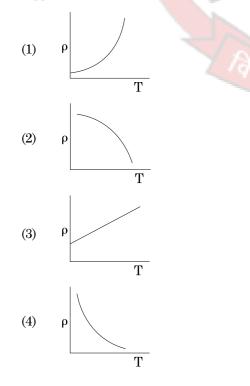
 $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$

- (1) $2.4\pi \times 10^{-5} \mathrm{T m A}^{-1}$
- (2) $2.4\pi \times 10^{-7} \text{ T m A}^{-1}$
- (3) $2.4\pi \times 10^{-4} \text{ T m A}^{-1}$
- (4) $8.0 \times 10^{-5} \,\mathrm{Tm \, A^{-1}}$
- **122.** Find the torque about the origin when a force of $3\hat{j}$ N acts on a particle whose position vector is $2\hat{k}$ m.
 - (1) $-6\hat{i}$ N m
 - (2) $6\hat{k}$ N m (3) $6\hat{i}$ N m
 - (4) $6\dot{j}$ N m
- 123. The average thermal energy for a mono-atomic gas is : (k_B is Boltzmann constant and T, absolute temperature)

(1)
$$\frac{5}{2} k_{B}T$$

(2) $\frac{7}{2} k_{B}T$
(3) $\frac{1}{2} k_{B}T$
(4) $\frac{3}{2} k_{B}T$

- **124.** Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is :
 - 7.32×10^{-7} rad (1)
 - 6.00×10^{-7} rad (2)
 - (3) 3.66×10^{-7} rad
 - 1.83×10^{-7} rad (4)
- Light with an average flux of 20 W/cm² falls on a 125.non-reflecting surface at normal incidence having surface area 20 cm^2 . The energy received by the surface during time span of 1 minute is :
 - $24 \times 10^3 \,\mathrm{J}$ (1)
 - $48 \times 10^3 \,\mathrm{J}$ (2)
 - $10 \times 10^3 \,\mathrm{J}$ (3)
 - $12 \times 10^{3} J$ (4)
- The ratio of contributions made by the electric field 126. and magnetic field components to the intensity of an electromagnetic wave is : (c = speed of electromagnetic waves)
 - (1)1:c
 - (2) $1:c^2$
 - (3)c:1
 - (4)1:1
- 127. Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper?



- 128. The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5 r_2$) through 1 K are in the ratio:
 - 3 (1) $\overline{2}$ $\mathbf{5}$ (2) $\overline{3}$ 27(3)8 9 (4)
- 129. A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3:2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is :
 - $1.5 \times 10^{-1} \,\mathrm{m}$ (1)
 - $1.5 \times 10^{-2} \,\mathrm{m}$ (2)
 - $1.0 \times 10^{-2} \,\mathrm{m}$ (3)
 - $1.0 \times 10^{-1} \,\mathrm{m}$ (4)
- 130. The increase in the width of the depletion region in a p-n junction diode is due to :
 - (1)both forward bias and reverse bias
 - (2)increase in forward current
 - (3)forward bias only
 - (4)reverse bias only
- 131. A 40 µF capacitor is connected to a 200 V, 50 Hz ac supply. The rms value of the current in the circuit is, nearly :
 - $2.5\,\mathrm{A}$ (1)
 - (2) $25.1\,\mathrm{A}$
 - $1.7\,\mathrm{A}$ (3)
 - $2.05 \,\mathrm{A}$ (4)
- Taking into account of the significant figures, what 132. is the value of 9.99 m - 0.0099 m?
 - 9.980 m (1)
 - (2)9.9 m
 - 9.9801 m (3)
 - (4)9.98 m

- A charged particle having drift velocity of 133. 7.5×10^{-4} m s⁻¹ in an electric field of 3×10^{-10} Vm⁻¹, has a mobility in m² V⁻¹ s⁻¹ of:
 - (1) 2.5×10^{-6}
 - 2.25×10^{-15} (2)
 - 2.25×10^{15} (3)
 - (4) 2.5×10^{6}
- **134.** In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original CALSCHO frequency of B will be :
 - $536\,\mathrm{Hz}$ (1)
 - (2) $537\,\mathrm{Hz}$
 - $523\,\mathrm{Hz}$ (3)
 - $524\,\mathrm{Hz}$ (4)
- Two particles of mass 5 kg and 10 kg respectively 135. are attached to the two ends of a rigid rod of length 1 m with negligible mass.

The centre of mass of the system from the 5 kg particle is nearly at a distance of :

- (1)67 cm
- (2)80 cm
- 33 cm (3)
- (4)50 cm
- Reaction between benzaldehyde and acetophenone 136. in presence of dilute NaOH is known as :
 - (1)Cross Cannizzaro's reaction
 - (2)Cross Aldol condensation
 - (3)Aldol condensation
 - (4)Cannizzaro's reaction
- Measuring Zeta potential is useful in determining 137. which property of colloidal solution?
 - Stability of the colloidal particles (1)
 - (2)Size of the colloidal particles
 - (3)Viscosity
 - Solubility (4)

- 138. A tertiary butyl carbocation is more stable than a secondary butyl carbocation because of which of the following?
 - -R effect of $-CH_3$ groups (1)
 - (2)Hyperconjugation

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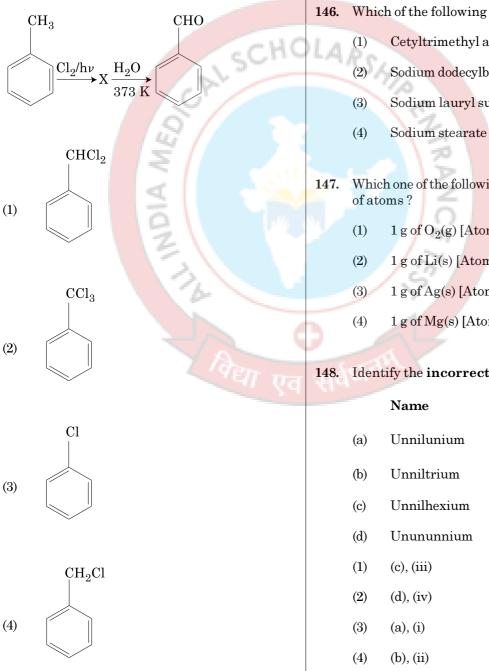
- -I effect of $-CH_3$ groups (3)
- $+ R effect of CH_3 groups$ (4)
- The correct option for free expansion of an ideal 139. gas under adiabatic condition is :
 - $q < 0, \Delta T = 0$ and w = 0(1)
 - (2)q > 0, $\Delta T > 0$ and w > 0
 - $q = 0, \Delta T = 0$ and w = 0(3)
 - (4) $q = 0, \Delta T < 0 \text{ and } w > 0$
- 140. Match the following:

		Oxid	е		Nature			
	(a)	CO	2	(i)	Basic			
	(b)	BaO	70	(ii)	Neutral			
	(c)	Al_2O_2	3 2	(iii)	Acidic			
	(d)	Cl_2O	$\overline{\leq}$	(iv)	Amphoteric			
Which of the following is correct option								
	vv mic	in or un	e 10110	wing i	s correct option			
	vv IIIC	(a)	(b)	(c)	(d)			
	(1)		177	Ū	-			
		(a)	(b)	(c)	(d)			
	(1)	(a) (iii)	(b) (iv)	(c) (i)	(d) (ii)			
	(1) (2)	(a) (iii) (iv)	(b) (iv) (iii)	(c) (i) (ii)	(d) (ii) (i)			

?

- 141. Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give :
 - (1)Tert. butyl alcohol
 - (2)Isobutyl alcohol
 - Isopropyl alcohol (3)
 - (4) Sec. butyl alcohol
- 142. The following metal ion activates many enzymes, participates in the oxidation of glucose to produce ATP and with Na, is responsible for the transmission of nerve signals.
 - Calcium (1)
 - Potassium (2)
 - (3)Iron
 - (4)Copper

- 143. Which of the following is a basic amino acid ?
 - (1)Tyrosine
 - (2)Lysine
 - (3)Serine
 - (4)Alanine
- 144. Identify compound X in the following sequence of reactions:



- 145. Which of the following is the **correct** order of increasing field strength of ligands to form coordination compounds?
 - $F^- < SCN^- < C_2O_4^{2-} < CN^-$ (1)
 - $CN^{-} < C_2 O_4^{2-} < SCN^{-} < F^{-}$ (2)
 - $SCN^- < F^- < C_2 O_4^{2-} < CN^-$ (3)
 - $SCN^- < F^- < CN^- < C_2O_4^{2-}$ (4)

Which of the following is a cationic detergent?

- Cetyltrimethyl ammonium bromide
- Sodium dodecylbenzene sulphonate
- Sodium lauryl sulphate
- Which one of the followings has maximum number
 - $1 \operatorname{g} \operatorname{of} O_2(g)$ [Atomic mass of O = 16]
 - 1 g of Li(s) [Atomic mass of Li = 7]
 - 1 g of Ag(s) [Atomic mass of Ag = 108]
 - $1 \operatorname{g of Mg(s)} [\operatorname{Atomic mass of Mg} = 24]$

Identify the incorrect match.

IUPAC Official Name Mendelevium (i) Lawrencium (ii) (iii) Seaborgium (iv) Darmstadtium

149. Which of the following amine will give the carbylamine test?152. The number of protons, neutrons and electrons in $\frac{115}{75}$ Lu, respectively, are : (1) $175, 104$ and 71 (2) 175, 104 and 71 (3) 71, 104 and 71 (4) 104, 71 and 104 (2) 175, 104 and 71 (3) 71, 104 and 71 (4) 104, 71 and 71(7)NHC2H5 (9)(1) 150 or s^{+1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 500 s^{-1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 500 s^{-1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 500 s^{-1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 500 s^{-1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 500 s^{-1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 500 s^{-1} . The time required to reduce 2.0 g of the reactant to 0.2 g is : (1) 150 m^{-1} . (2) $-63.14 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (2) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (3) $-8.314 \text{ Jmol}^{-1} \text{K}^{-1} \times 300 \text{ K} \ln(3 \times 10^{13})$ (4) $-4.18 \times 0 \text{ and } 4.5 \times 0$ (5) $-4.18 \times 0 \text{ and } 4.5 \times 0$ (6) $-4.18 \times 0 \text{ and } 4.5 \times 0$ (7) $-4.18 \times 0 \text{ and } 4.5 \times 0$ (7) $-4.18 \times 0 \text{ and } 4.5 \times 0$ (8) $-4.18 \times 0 $	гт	1	.0	
$ \begin{array}{c} \text{(1)} & (1) & ($	149.		152.	
$\begin{array}{c} (2) \qquad 175, 104 \mbox{ and } 71 \\ (3) \qquad 71, 104 \mbox{ and } 71 \\ (4) \qquad 104, 71 \mbox{ and } 71 \\ (4) \qquad 104, 71 \mbox{ and } 71 \\ (4) \qquad 104, 71 \mbox{ and } 71 \\ (4) \qquad 104, 71 \mbox{ and } 71 \\ (4) \qquad 104, 71 \mbox{ and } 71 \\ (5) \qquad 175, 104 \mbox{ and } 71 \\ (6) \qquad 106, 10^{-3} \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (1) \qquad 500 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (1) \qquad 500 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (2) \qquad 100 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (3) \qquad 100 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (4) \qquad 100 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (4) \qquad 100 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (4) \qquad 100 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got the reactant to } 0.2 \mbox{ gis : } \\ (4) \qquad 100 \mbox{ scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required to reduce } 2.0 \mbox{ got scale}^{-1}, The time required $				
(i) (i) (i) (i) (i) (i) (i) (i)		$N(CH_{c})$		
(1) (1) (1) (1) (1) (1) (1) (1)				
(b) $HC_{2}H_{5}$ (c) $HC_{2}H_{5}$ (c) HC_{2}				(3) 71, 104 and 71
$\begin{array}{c} 4.666 \times 10^{-3} \mathrm{s}^{-1}. \ \mathrm{The \ time\ required\ to\ reduce\ 2.0\ g\ of\ the\ reactant\ to\ 2.2\ g\ s: \\ (1) 500\ \mathrm{s} \\ (2) 1000\ \mathrm{s} \\ (3) 100\ \mathrm{s} \\ (4) 200\ \mathrm{s} \\ (5) 161\ \mathrm{Hydrolysis\ of\ sucrose\ is\ given\ by\ the\ following\ reaction. \\ Sucrose\ H\ fue\ equilibrium\ constant\ (\mathrm{K}_{2}\ \mathrm{is\ 2\times 10^{13}\ at\ 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s}^{2}\ \mathrm{s\ 2\times 10^{13}\ at\ 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (2) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (3) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (4) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (4) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (4) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ \mathrm{J\ mol\ ^{-1}K^{-1}\times 300\ \mathrm{K}\ \mathrm{ht}(\mathrm{s\ 10^{3})} \\ (5) -8.314\ I\ mol$				(4) 104, 71 and 71
(2) $III = 1000 \text{ s}$ (3) $III = 1000 \text{ s}$ (4) $III = 1000 \text{ s}$ (5) $III = 1000 \text{ s}$ (6) $III = 1000 \text{ s}$ (7) $III = 1000 \text{ s}$ (8) $IIII = 1000 \text{ s}$ (9) $III = 1000 \text{ s}$ (10) $III = 1000 \text{ s}$ (11) $III = 1000 \text{ s}$ (11) $III = 1000 \text{ s}$ (11) $III = 1000 \text{ s}$ (12) $IIII = 1000 \text{ s}$ (13) $IIII = 1000 \text{ s}$ (14) $IIII = 1000 \text{ s}$ (15) $IIII = 1000 \text{ s}$ (16) $IIII = 1000 \text{ s}$ (17) $IIII = 1000 \text{ s}$ (18) $IIII = 10000 \text{ s}$ (19) $IIIII = 10000 \text{ s}$ (20) $IIIII = 10000 \text{ s}$ (21) $IIIII = 10000 \text{ s}$ (22) $IIIII = 10000 \text{ s}$ (23) $IIIII = 10000 \text{ s}$ (24) $IIIII = 10000 \text{ s}$ (25) $IIIII = 10000 \text{ s}$ (26) $IIIII = 10000 \text{ s}$ (27) $IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII$			153.	4.606×10^{-3} s ⁻¹ . The time required to reduce
(2) (3) (3) (4) (3) (3) (4) (5) (5) (6) (7) (6) (7) (7) (7) (7) (8) (9) (9) (9) (9) (9) (9) (9) (9		$\mathrm{NHC}_{2}\mathrm{H}_{5}$		(1) $500 \mathrm{s}$
(2) (3) (4) 200 s 154. Identify a molecule which does not exist. (1) C_2 (2) O_2 (3) He_2 (4) Li_2 155. Hydrolysis of sucrose is given by the following reaction. Sucrose $H_2O \rightleftharpoons$ Glucose + Fructose If the equilibrium constant (K ₂) is 2×10^{13} at 300 K , the value of $\Delta_1 G^\circ$ at the same temperature will be: (1) Thin layer chromatography (2) Column chromatography (3) Adsorption chromatography (4) Partition chromatography (5) Adsorption chromatography (6) Paper sin the cylinder is 27 bar, the partial pressure of N ₂ is: [Use atomic masses (in g mol ⁻¹): N=14, Ar=40] (1) 15 bar (2) 18 bar (3) 9 bar (4) 200 s 154. Identify a molecule which does not exist. (1) C_2 (2) O_2 (3) He_2 (4) Li_2 155. Hydrolysis of sucrose is given by the following reaction. Sucrose $H_2O \rightleftharpoons$ Glucose + Fructose If the equilibrium constant (K ₂) is 2×10^{13} at 300 K , the value of $\Delta_1 G^\circ$ at the same temperature will be: (1) $\Delta_1 H < 0$ and $\Delta_2 S < 0$ (3) $\Delta_1 H < 0$ and $\Delta_2 S < 0$ (4) $\Delta_2 H < 0$ and $\Delta_2 S < 0$ (5) $A_1 H < 0$ and $\Delta_2 S < 0$ (6) $\Delta_4 H < 0$ and $\Delta_5 S < 0$ (7) Find out the solubility of Ni(OH) ₂ in 0.1 M NaOH. Given that the ionic product of Ni(OH) ₂ is 2×10^{-13} M (2) 1×10^{-13} M (3) 2×10^{-13} M (4) 2×10^{-13} M				(2) $1000 \mathrm{s}$
(4) 200s $(5) (1) 200s$ $(4) (2) (2) (3$				(3) 100 s
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)				(4) $200 \mathrm{s}$
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)		- CHC)LA	P.
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)		Sour	154.	
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)		NUL CAL		(1) C_2
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)		NH ₂		(2) O ₂
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)				(3) He ₂
(a) NHCH ₃ (b) NHCH ₃ (c) NHCH ₃ (c) (c) (c) (c) (c) (c) (c) (c)				(4) Li_2
(4) (4) (5) Paper chromatography is an example of: (1) Thin layer chromatography (2) Column chromatography (3) Adsorption chromatography (4) Partition chromatography (5) Adsorption chromatography (6) Partition chromatography (7) Thin layer chromatography (8) Adsorption chromatography (9) Partition chromatography (10) This partial pressure of N ₂ and Ar gases in a cylinder contains 7 g of N ₂ and 8 g of Ar. If the total pressure of the mixture of N ₂ and Ar gases in a cylinder contains 7 g of N ₂ and 8 g of Ar. If the total pressure of the partial pressure of N ₂ is : [Use atomic masses (in g mol ⁻¹): N = 14, Ar = 40] (1) 15 bar (2) 18 bar (3) 9 bar (4) Partition chromatography (5) For the reaction, 2Cl(g) \rightarrow Cl ₂ (g), the correct option is : (1) $\Delta_r H < 0$ and $\Delta_r S > 0$ (2) $\Delta_r H < 0$ and $\Delta_r S < 0$ (3) $\Delta_r H > 0$ and $\Delta_r S < 0$ (4) $\Delta_r H > 0$ and $\Delta_r S < 0$ (5) Find out the solubility of Ni(OH) ₂ in 0.1 M NaOH. Given that the ionic product of Ni(OH) ₂ is 2×10^{-15} . (1) $1 \times 10^{-13} M$ (2) $1 \times 10^{-13} M$ (3) $2 \times 10^{-13} M$ (4) $2 \times 10^{-13} M$				2 5
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(1) 15 bar (1) 1×10^{-13} M (2) 18 bar (2) 1×10^8 M (3) 9 bar (3) 2×10^{-13} M		-	197.	Given that the ionic product of $Ni(OH)_2$ is
(2) 18 bar (3) 9 bar (3) 9 bar (3) $2 \times 10^{-13} \text{ M}$ (4) $2 \times 10^{-13} \text{ M}$				
(3) 9 bar (3) 2×10^{-13} M (5) 2×10^{-13} M		(2) 18 bar		
(4) 12 par (4) 2 × 10 $^{-1}$ M				
		(4) 12 0ar		

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- **158.** On electrolysis of dil.sulphuric acid using Platinum (Pt) electrode, the product obtained at anode will be :
 - (1) $H_2S gas$
 - (2) SO_2 gas
 - (3) Hydrogen gas
 - (4) Oxygen gas
- **159.** Which of the following is **not** correct about carbon monoxide ?
 - (1) The carboxyhaemoglobin (haemoglobin bound to CO) is less stable than oxyhaemoglobin.
 - (2) It is produced due to incomplete combustion.
 - (3) It forms carboxyhaemoglobin.
 - (4) It reduces oxygen carrying ability of blood.
- 160. The number of Faradays(F) required to produce 20 g of calcium from molten $CaCl_2$ (Atomic mass of Ca = 40 g mol⁻¹) is :
 - (1) 3
 - (2) 4
 - (3) 1
 - (4) 2
- **161.** Elimination reaction of 2-Bromo-pentane to form pent-2-ene is :
 - (a) β -Elimination reaction
 - (b) Follows Zaitsev rule
 - (c) Dehydrohalogenation reaction
 - (d) Dehydration reaction
 - (1) (b), (c), (d)
 - (2) (a), (b), (d)
 - (3) (a), (b), (c)
 - (4) (a), (c), (d)
- **162.** What is the change in oxidation number of carbon in the following reaction ?
 - $CH_4(g) + 4Cl_2(g) \rightarrow CCl_4(l) + 4HCl(g)$
 - (1) -4 to +4
 - (2) 0 to -4
 - (3) + 4 to + 4
 - (4) 0 to + 4

- **163.** Which of the following alkane cannot be made in good yield by Wurtz reaction ?
 - (1) n-Heptane
 - (2) n-Butane
 - (3) n-Hexane
 - (4) 2,3-Dimethylbutane
- 164. Sucrose on hydrolysis gives :
 - (1) α -D-Glucose + β -D-Fructose
 - (2) α -D-Fructose + β -D-Fructose
 - (3) β -D-Glucose + α -D-Fructose
 - (4) α -D-Glucose + β -D-Glucose
- 165. Identify the incorrect statement.
 - (1) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.
 - (2) The oxidation states of chromium in CrO_4^{2-} and $Cr_2O_7^{2-}$ are not the same.
 - (3) $Cr^{2+}(d^{4})$ is a stronger reducing agent than $Fe^{2+}(d^{6})$ in water.
 - (4) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.
- **166.** HCl was passed through a solution of CaCl₂, MgCl₂ and NaCl. Which of the following compound(s) crystallise(s) ?
 - (1) $Only MgCl_2$
 - (2) NaCl, $MgCl_2$ and $CaCl_2$
 - $(3) \qquad {\rm Both}\, {\rm MgCl}_2\, {\rm and}\, {\rm CaCl}_2$
 - (4) Only NaCl

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167.		ntify t wing:	he co	orrec	t stat	ements from the	172.	Ani	sole on cleavage with HI gives :			
	(a)		(g) is u rozen		refrig	erant for ice-cream			OH			
	(b)					ontains twelve six y five carbon rings.		(1)				
	(c)		-5, a ty ols int			, is used to convert		(-)	$+C_2H_5I$			
	(d)	CO is	s color	less ai	nd odou	ırless gas.						
	(1)	(b) ai	nd (c) o	only					I			
	(2)	(c) ar	nd (d) d	only					Ĩ			
	(3)	(a), (b) and	(c) on	ly							
	(4)	(a) ai	nd (c) (only				(2)	$+C_2H_5OH$			
168.					entrati ange i	ion of the reactants n :						
	(1)	thres	shold e	nergy		Chu	LA	Ro	OU			
	(2)	collis	ion fre	equend	cy	ALSCIN			OH			
	(3)	activ	atione	energy	,	Cr /						
	(4)		ofread		/a	Š/ 🗠		(3)	$+ CH_{3}I$			
169.	The ion i		ted spi	in only	magne	etic moment of $ m Cr^{2+}$						
	(1)	5.92	BM		2		17.5					
	(2)	2.84	BM		2							
	(3)	3.87	BM		0		N /		Ω			
	(4)	4.90	BM		2							
170.	Match the following and identify the correct							(4)	+ CH ₃ OH			
	optic											
	(a)	CO(g	$() + H_2$	(g)	(i)	$Mg(HCO_3)_2 +$						
					- 2	Ca(HCO ₃) ₂	173.		ea reacts with water to form A which will			
	(b)		porary		(ii)	An electron	-		ompose to form B. B when passed through			
		hard wate	ness o:	ť		deficient hydride	and		Cu^{2+} (aq), deep blue colour solution C is formed What is the formula of C from the following ?			
					(iii)	Synthesis gas	N. 1					
	(c) (d)	B_2H_0 H_2O_2	-		(iii) (iv)	Non-planar		(1)	Cu(OH) ₂			
	(0.)	202	Z		(21)	structure		(2)	CuCO ₃ ·Cu(OH) ₂			
		(a)	(b)	(c)	(d)			(3)	$CuSO_4$			
	(1)	(iii)	(iv)	(ii)	(i)			(4)	$[Cu(NH_3)_4]^{2+}$			
	(2)	(i)	(iii)	(ii)	(iv)		174.	ጥኡ	e freezing point depression constant (K_f) of			
	(3)	(iii)	(i)	(ii)	(iv)		1/4.		zene is $5.12 \text{ K kg mol}^{-1}$. The freezing point			
	(4)	(iii)	(ii)	(i)	(iv)			dep	ression for the solution of molality 0.078 m			
171.		The mixture which shows positive deviation from Raoult's law is :							taining a non-electrolyte solute in benzene is unded off upto two decimal places) :			
	(1)		m = 13.	hloro	form			(1)	0.40 K			
	(1)				romoet	hane		(2)	0.60 K			
	(2)							(3)	0.20 K			
	(3) Ethanol + Acetone(4) Benzene + Toluene							(4)	0.80 K			
	(1)	DellZ		TOTAGE				(-)				

- **175.** Which of the following oxoacid of sulphur has -O-O- linkage?
 - (1) $H_2S_2O_8$, peroxodisulphuric acid
 - (2) $H_2S_2O_7$, pyrosulphuric acid
 - (3) H_2SO_3 , sulphurous acid
 - (4) H_2SO_4 , sulphuric acid
- **176.** Identify the **correct** statement from the following:
 - (1) Vapour phase refining is carried out for Nickel by Van Arkel method.
 - (2) Pig iron can be moulded into a variety of shapes.
 - (3) Wrought iron is impure iron with 4% carbon.
 - (4) Blister copper has blistered appearance due to evolution of CO₂.
- 177. Which of the following is a natural polymer?
 - (1) polybutadiene
 - (2) poly (Butadiene-acrylonitrile)
 - (3) *cis*-1,4-polyisoprene
 - (4) poly (Butadiene-styrene)
- 178. An element has a body centered cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is :

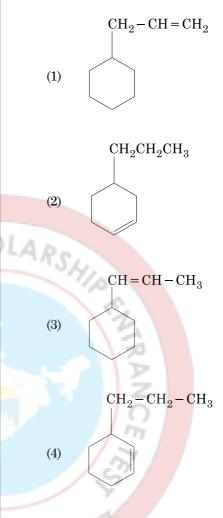
(1)
$$\frac{4}{\sqrt{3}} \times 288 \text{ pm}$$

(2)
$$\frac{4}{\sqrt{2}} \times 288 \text{ pm}$$

(3)
$$\frac{\sqrt{3}}{4} \times 288 \text{ pm}$$

(4)
$$\frac{\sqrt{2}}{4} \times 288 \text{ pm}$$

179. An alkene on ozonolysis gives methanal as one of the product. Its structure is :



- **180.** Which of the following set of molecules will have zero dipole moment?
 - (1) Nitrogen trifluoride, beryllium difluoride, water, 1,3-dichlorobenzene
 - (2) Boron trifluoride, beryllium difluoride, carbon dioxide, 1,4-dichlorobenzene
 - (3) Ammonia, beryllium difluoride, water, 1,4-dichlorobenzene
 - (4) Boron trifluoride, hydrogen fluoride, carbon dioxide, 1,3-dichlorobenzene

- 0 0 0 -

22 Space For Rough Work



23 Space For Rough Work



$\mathbf{G1}$

 $\begin{array}{ll} \textbf{A} \mbox{ wire of length } L, \mbox{ area of cross section } A \mbox{ is hanging} \\ \mbox{ from a fixed support. The length of the wire} \\ \mbox{ changes to } L_1 \mbox{ when mass } M \mbox{ is suspended from its} \\ \mbox{ free end. The expression for Young's modulus is :} \end{array}$

(1)
$$\frac{\mathrm{Mg}(\mathrm{L}_{1}-\mathrm{L})}{\mathrm{AL}}$$

(2)
$$\frac{\text{MgL}}{\text{AL}_1}$$

(3)
$$\frac{MgL}{A(L_1 - L)}$$

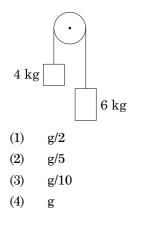
٦....

$$(4) \qquad \frac{\mathrm{MgL}_{1}}{\mathrm{AL}}$$

2. A cylinder contains hydrogen gas at pressure of 249 kPa and temperature 27°C.

Its density is : $(R = 8.3 \text{ J mol}^{-1} \text{ K}^{-1})$

- (1) 0.2 kg/m^3
- (2) 0.1 kg/m^3
- (3) 0.02 kg/m^3
- (4) 0.5 kg/m^3
- Light with an average flux of 20 W/cm² falls on a non-reflecting surface at normal incidence having surface area 20 cm². The energy received by the surface during time span of 1 minute is :
 - (1) $12 \times 10^3 \, J$
 - (2) $24 \times 10^3 \,\mathrm{J}$
 - (3) $48 \times 10^3 \,\text{J}$
 - (4) $10 \times 10^3 \,\text{J}$
- 4. Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is :



5.

6.

7.

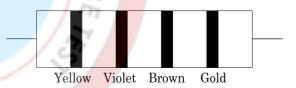
The mean free path for a gas, with molecular diameter d and number density n can be expressed as :

(1)
$$\frac{1}{\sqrt{2} n \pi d^2}$$

(2) $\frac{1}{\sqrt{2} n^2 \pi d^2}$
(3) $\frac{1}{\sqrt{2} n^2 \pi^2 d^2}$
(4) $\frac{1}{\sqrt{2} n \pi d}$

- A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is : $(g = 10 \text{ m/s}^2)$
 - (1) 340 m
 - (2) 320 m
 - (3) 300 m
 - (4) 360 m

The color code of a resistance is given below :



The values of resistance and tolerance, respectively, are :

- 47 kΩ, 10%
 4.7 kΩ, 5%
- (3) $470 \Omega, 5\%$
- (4) 470 k Ω , 5%
- 8. When a uranium isotope ${}^{235}_{92}$ U is bombarded with a neutron, it generates ${}^{89}_{36}$ Kr, three neutrons and :
 - (1) ${}^{91}_{40}$ Zr
 - (2) ${}^{101}_{36}$ Kr
 - (3) $^{103}_{36}$ Kr
 - (4) $^{144}_{56}$ Ba

- 3
- 9. A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere ?

$$\begin{pmatrix} \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2 \\ (1) & 1.28 \times 10^5 \text{ N/C} \\ (2) & 1.28 \times 10^6 \text{ N/C} \\ (2) & 1.28 \times 10^7 \text{ N/C} \\ (3) & 1.28 \times 10^7 \text{ N/C} \\ (4) & 1.28 \times 10^7 \text{ N/C} \\ (5) & 1.28 \times 10^7 \text{ N/C} \\ (6) & 1.28 \times 10^7 \text{ N/C} \\ (7) & 1.28$$

- (3) $1.28 \times 10^{\circ} \text{ N/C}$ (4) $1.28 \times 10^{4} \text{ N/C}$
- 10. A ray is incident at an angle of incidence *i* on one surface of a small angle prism (with angle of prism A) and emerges normally from the opposite surface. If the refractive index of the material of the prism is μ, then the angle of incidence is nearly equal to :
 - (1) $\frac{2A}{a}$

 - (3) $\frac{\mu A}{2}$ (4) $\frac{A}{2\mu}$
- 11. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is :
 - (1) adiabatic
 - (2) isochoric
 - (3) isobaric
 - (4) isothermal
- 12. An iron rod of susceptibility 599 is subjected to a magnetising field of 1200 A m⁻¹. The permeability of the material of the rod is :

 $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$

- (1) $8.0 \times 10^{-5} \,\mathrm{T \ m \ A^{-1}}$
- (2) $2.4\pi \times 10^{-5} \text{ T m A}^{-1}$
- (3) $2.4\pi \times 10^{-7} \text{ T m A}^{-1}$
- (4) $2.4\pi \times 10^{-4} \text{ T m A}^{-1}$
- **13.** The energy equivalent of 0.5 g of a substance is :
 - (1) $4.5 \times 10^{13} \,\mathrm{J}$
 - (2) $1.5 \times 10^{13} \,\mathrm{J}$
 - (3) $0.5 \times 10^{13} \,\mathrm{J}$
 - (4) $4.5 \times 10^{16} \,\mathrm{J}$

- 14. A 40 μ F capacitor is connected to a 200 V, 50 Hz ac supply. The rms value of the current in the circuit is, nearly :
 - $(1) 2.05 \,\mathrm{A}$
 - (2) 2.5 A
 - (3) 25.1 A
 - (4) 1.7 A
- 15. The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is : (c = speed of electromagnetic waves)
 - (1) 1:1(2) 1:c(3) $1:c^2$ (4) c:1
- Two particles of mass 5 kg and 10 kg respectively are attached to the two ends of a rigid rod of length 1 m with negligible mass.

The centre of mass of the system from the 5 kg particle is nearly at a distance of :

- (1) 50 cm
- (2) 67 cm
- (3) 80 cm
- (4) 33 cm
- 17. A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is :
 - (1) $1.0 \times 10^{-1} \,\mathrm{m}$
 - (2) $1.5 \times 10^{-1} \,\mathrm{m}$
 - (3) $1.5 \times 10^{-2} \,\mathrm{m}$
 - (4) $1.0 \times 10^{-2} \,\mathrm{m}$
- **18.** In Young's double slit experiment, if the separation between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes :
 - (1) half
 - (2) four times
 - (3) one-fourth
 - (4) double

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- 19. A charged particle having drift velocity of 7.5×10^{-4} m s⁻¹ in an electric field of 3×10^{-10} Vm⁻¹, has a mobility in m² V⁻¹ s⁻¹ of:
 - (1) 2.5×10^{6}
 - (2) 2.5×10^{-6}
 - (3) 2.25×10^{-15}
 - (4) 2.25×10^{15}
- 20. Dimensions of stress are :
 - (1) $[ML^2T^{-2}]$
 - (2) $[ML^0T^{-2}]$
 - (3) $[ML^{-1}T^{-2}]$
 - (4) $[MLT^{-2}]$
- 21. For which one of the following, Bohr model is not valid ?
 - (1) Singly ionised helium atom (He⁺)
 - (2) Deuteron atom
 - (3) Singly ionised neon atom (Ne^+)
 - (4) Hydrogen atom
- 22. A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is $\frac{\pi}{3}$. If instead C is removed from the circuit,

the phase difference is again $\frac{\pi}{3}$ between current and voltage. The power factor of the circuit is :

- (1) 0.5
- (2) 1.0
- (3) -1.0
- (4) zero
- 23. A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of the water in the capillary is 5 g. Another capillary tube of radius 2r is immersed in water. The mass of water that will rise in this tube is :
 - (1) 5.0 g
 - (2) 10.0 g
 - (3) 20.0 g
 - (4) 2.5 g
- 24. Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is :
 - (1) 1.83×10^{-7} rad
 - (2) $7.32 \times 10^{-7} \, rad$
 - (3) $6.00 \times 10^{-7} \, \text{rad}$
 - (4) $3.66 \times 10^{-7} \, \mathrm{rad}$

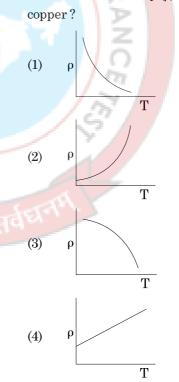
- 4
 - **25.** The solids which have the negative temperature coefficient of resistance are :
 - (1) insulators only
 - (2) semiconductors only
 - (3) insulators and semiconductors
 - (4) metals
 - - $(\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2})$
 - (1) $1.77 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - (2) $0.44 \times 10^{-10} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - (3) $5.00 \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - (4) $0.44 \times 10^{-13} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$
 - 27. The energy required to break one bond in DNA is 10^{-20} J. This value in eV is nearly :
 - (1) 0.6
 - (2) 0.06
 - (3) 0.006
 - (4) 6
 - 28. The increase in the width of the depletion region in a p-n junction diode is due to :
 - (1) reverse bias only
 - (2) **both forward bias and reverse bias**
 - (3) increase in forward current
 - (4) forward bias only
 - 29. The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5 r_2$) through 1 K are in the ratio :
 - (1) $\frac{9}{4}$ (2) $\frac{3}{2}$ (3) $\frac{5}{3}$ (4) $\frac{27}{9}$

L

33. A short electric dipole has a dipole moment of 16×10^{-9} C m. The electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of 60° with the dipole axis is :

$$\begin{pmatrix} \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2 \\ (1) & 200 \text{ V} \\ (2) & 400 \text{ V} \end{cases}$$

- (4) 50 V
- **34.** A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth ?
 - (1) 32 N
 - (2) 30 N
 - (3) 24 N
 - (4) 48 N
- 35. Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for



- **36.** In a certain region of space with volume 0.2 m³, the electric potential is found to be 5 V throughout. The magnitude of electric field in this region is :
 - (1) 0.5 N/C
 - (2) 1 N/C
 - (3) 5 N/C
 - (4) zero

- **30.** For the logic circuit shown, the truth table is :
 - A Y В (1)А В Y 0 0 0 0 1 1 1 0 1 1 1 1 (2)А В Y 0 0 1 0 1 1 CALSCH 1 0 1 0 1 1 Υ (3)А В 1 0 0 0 0 1 0 1 0 1 1 0 (4)А В Y 0 0 0 0 1 0 0 0 1 1 1 1
- **31.** For transistor action, which of the following statements is **correct**?
 - (1) Base, emitter and collector regions should have same size.
 - (2) Both emitter junction as well as the collector junction are forward biased.
 - (3) The base region must be very thin and lightly doped.
 - (4) Base, emitter and collector regions should have same doping concentrations.
- **32.** In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be :
 - (1) 524 Hz
 - (2) 536 Hz
 - (3) 537 Hz
 - (4) 523 Hz

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(1)
$$\frac{3}{2} k_{B}T$$

(2) $\frac{5}{2} k_{B}T$
(3) $\frac{7}{2} k_{B}T$

(4)
$$\frac{1}{2} k_{\rm B} T$$

38. Find the torque about the origin when a force of $3\hat{j}$ N acts on a particle whose position vector is

- $2 \hat{k} \text{ m} \cdot$
- (1) 6j N m
- (2) $-6\hat{i}$ N m
- (3) $6\hat{k}$ N m
- (4) $6\hat{i}$ N m
- **39.** Light of frequency 1.5 times the threshold frequency is incident on a photosensitive material. What will be the photoelectric current if the frequency is halved and intensity is doubled?
 - (1) four times
 - (2) one-fourth
 - (3) zero
 - (4) doubled
- **40.** A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is :

 $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$

- (1) $3.14 \times 10^{-4} \,\mathrm{T}$
- (2) $6.28 \times 10^{-5} \,\mathrm{T}$
- (3) $3.14 \times 10^{-5} \,\mathrm{T}$
- (4) $6.28 \times 10^{-4} \,\mathrm{T}$
- **41.** The Brewsters angle i_b for an interface should be :
 - (1) $30^{\circ} < i_h < 45^{\circ}$
 - (2) $45^{\circ} < i_b < 90^{\circ}$
 - (3) $i_b = 90^{\circ}$
 - (4) $0^{\circ} < i_b < 30^{\circ}$

- An electron is accelerated from rest through a potential difference of V volt. If the de Broglie wavelength of the electron is 1.227×10^{-2} nm, the
- potential difference is : (1) $10^2 V$

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44.

- (1) $10^2 V$ (2) $10^3 V$
- (2) 10^{4} V (3) 10^{4} V
- (4) 10 V
- 43. Taking into account of the significant figures, what is the value of 9.99 m 0.0099 m?
 - (1) 9.98 m
 - $(2) \qquad 9.980 \text{ m}$
 - (3) 9.9 m
 - (4) 9.9801 m
 - A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.

The pitch of the screw gauge is :

- (1) 0.25 mm
- (2) 0.5 mm
- (3) 1.0 mm
- (4) 0.01 mm
- **45.** The phase difference between displacement and acceleration of a particle in a simple harmonic motion is :
 - (1) $\frac{3\pi}{2}$ rad (2) $\frac{\pi}{2}$ rad (3) zero
 - (4) π rad

46. Match the organism with its use in biotechnology.

- (c) Agrobacterium (iii) DNA polymerase tumefaciens
- (d) Salmonella (iv) Cry proteins typhimurium

Select the $\operatorname{correct}$ option from the following :

	(a)	(b)	(c)	(d)
(1)	(iv)	(iii)	(i)	(ii)
(2)	(iii)	(ii)	(iv)	(i)
(3)	(iii)	(iv)	(i)	(ii)
(4)	(ii)	(iv)	(iii)	(i)

47.	Mat	ch the following :	7 51.	The product(s) of reaction catalyzed by nitrogenase				
	(a)	Inhibitor of catalytic (i) Ricin		in root nodules of leguminous plants is/are :				
	()	activity		(1) Nitrate alone				
	(b)	Possess peptide bonds (ii) Malonate		(2) Ammonia and oxygen				
	(c)	Cell wall material in (iii) Chitin		(3) Ammonia and hydrogen				
		fungi Sacan dama matabalita (im) Callaran		(4) Ammonia alone				
	(d) Cho	Secondary metabolite (iv) Collagen ose the correct option from the following :	52.	Identify the incorrect statement.				
	Cho	(a) (b) (c) (d)	02.	(1) Sapwood is involved in conduction of wate				
	(1)	(iii) (i) (iv) (ii)		and minerals from root to leaf.				
	(2)	(iii) (iv) (i) (ii)		(2) Sapwood is the innermost secondary xylen				
	(3)	(ii) (iii) (i) (iv)		and is lighter in colour.				
	(4)	(ii) (iv) (iii) (i)		(3) Due to deposition of tannins, resins, oils etc heart wood is dark in colour.				
48.		plant parts which consist of two generations within the other :	ULA	(4) Heart wood does not conduct water but give mechanical support.				
	(a)	Pollen grains inside the anther	E 9	Designed and the start developed by the				
	(b)	Germinated pollen grain with two mal gametes	e 53.	Bt cotton variety that was developed by th introduction of toxin gene of <i>Bacillus thuringiensi</i> (Bt) is resistant to :				
	(c)	Seed inside the fruit		(1) Fungal diseases				
	(d)	Embryo sac inside the ovule	12	(2) Plant nematodes				
	(1)	(a), (b) and (c)	V., .	(3) Insect predators				
	(2)	(c) and (d)	• / /	(4) Insect pests				
	(3)	(a) and (d)						
	(4)	(a) only	54.	Which of the following pairs is of unicellular algae?				
49.		oxygenation activity of RuBisCo enzyme i	n	(1) Gelidium and Gracilaria				
	-	correspiration leads to the formation of :	Q.	(2) Anabaena and Volvox				
	(1) (2)	1 molecule of 3-C compound 1 molecule of 6-C compound		(3) Chlorella and Spirulina				
	(3)	1 molecule of 4-C compound and 1 molecul of 2-C compound	e di	(4) Laminaria and Sargassum				
	(4)	2 molecules of 3-C compound	55.	Strobili or cones are found in :				
	(1)			(1) Pteris				
50.		elation to Gross primary productivity and Ne		(2) Marchantia				
		nary productivity of an ecosystem, which on ne following statements is correct ?	e	(3) Equisetum				
	(1)	Gross primary productivity is always mor than net primary productivity.	e	(4) Salvinia				
	(2)	Gross primary productivity and Net primar productivity are one and same.	y 56.	Name the enzyme that facilitates opening of DNA helix during transcription.				
	(3)	There is no relationship between Gros		(1) DNA helicase				
		primary productivity and Net primar productivity.	У	(2) DNA polymerase				
	(4)	Gross primary productivity is always les	s	(3) RNA polymerase				
	. /	than net primary productivity.		(4) DNA ligase				

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- **57.** Identify the **wrong** statement with reference to transport of oxygen.
 - (1) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.
 - (2) Higher H⁺ conc. in alveoli favours the formation of oxyhaemoglobin.
 - (3) Low pCO₂ in alveoli favours the formation of oxyhaemoglobin.
 - Binding of oxygen with haemoglobin is mainly related to partial pressure of O₂.
- 58. Identify the **correct** statement with regard to G_1 phase (Gap 1) of interphase.
 - (1) Reorganisation of all cell components takes place.
 - (2) Cell is metabolically active, grows but does not replicate its DNA.
 - (3) Nuclear Division takes place.
 - (4) DNA synthesis or replication takes place.
- **59.** Which of the following statements about inclusion bodies is **incorrect**?
 - (1) These are involved in ingestion of food particles.
 - (2) They lie fre<mark>e in the cytoplasm.</mark>
 - (3) These represent reserve material in cytoplasm.
 - (4) They are not bound by any membrane.
- 60. Match the following diseases with the causative organism and select the correct option.

	Colı	ımn -	I		Column - II
(a)	Typh	noid		(i)	Wuche reria
(b)	Pneu	umonie	ı	(ii)	<u>Plasmodium</u>
(c)	Filar	riasis		(iii)	Salmonella
(d)	Mala	aria		(iv)	Haemophilus
	(a)	(b)	(c)	(d)	
(1)	(iii)	(iv)	(i)	(ii)	
(2)	(ii)	(i)	(iii)	(iv)	
(3)	(iv)	(i)	(ii)	(iii)	
(4)	(i)	(iii)	(ii)	(iv)	

- 61. Meiotic division of the secondary oocyte is completed:
 - $(1) \qquad {\rm At \ the \ time \ of \ copulation}$
 - (2) After zygote formation
 - (3) At the time of fusion of a sperm with an ovum
 - (4) Prior to ovulation

- **62.** By which method was a new breed 'Hisardale' of sheep formed by using Bikaneri ewes and Marino rams ?
 - (1) Mutational breeding
 - (2) Cross breeding
 - (3) Inbreeding
 - (4) Out crossing
- **63.** The number of substrate level phosphorylations in one turn of citric acid cycle is :
 - (1) One
 - (2) Two
 - (3) Three
 - (4) Zero
- 64. Choose the correct pair from the following :

(1)	Polymerases -	Break the DNA into fragments
(2)	Nucleases -	Separate the two strands of DNA
(3)	Exonucleases -	Make cuts at specific positions within DNA
(4)	Ligases -	Join the two DNA molecules

65. The infectious stage of *Plasmodium* that enters the human body is :

- (1) Sporozoites
- (2) Female gametocytes
- (3) Male gametocytes
- (4) Trophozoites
- **66.** Which of the following is **not** an attribute of a population ?
 - (1) Natality
 - (2) Mortality
 - (3) Species interaction
 - (4) Sex ratio

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- 67. Select the **correct** events that occur during 75 inspiration.
 - (a) Contraction of diaphragm
 - (b) Contraction of external inter-costal muscles
 - (c) Pulmonary volume decreases
 - (d) Intra pulmonary pressure increases
 - (1) (c) and (d)
 - (2) (a), (b) and (d)
 - (3) only (d)
 - (4) (a) and (b)
- **68.** According to Robert May, the global species diversity is about :
 - (1) 20 million
 - (2) 50 million
 - (3) 7 million
 - (4) 1.5 million
- 69. The QRS complex in a standard ECG represents :
 - (1) Depolarisation of auricles
 - (2) Depolarisation of ventricles
 - (3) Repolarisation of ventricles
 - (4) Repolarisation of auricles
- 70. Which of the following statements is not correct?
 - (1) The proinsulin has an extra peptide called C-peptide.
 - (2) The functional insulin has A and B chains linked together by hydrogen bonds.
 - (3) Genetically engineered insulin is produced in *E-Coli*.
 - (4) In man insulin is synthesised as a proinsulin.
- **71.** The transverse section of a plant shows following anatomical features :
 - (a) Large number of scattered vascular bundles surrounded by bundle sheath.
 - (b) Large conspicuous parenchymatous ground tissue.
 - (c) Vascular bundles conjoint and closed.
 - (d) Phloem parenchyma absent.
 - Identify the category of plant and its part :
 - (1) Monocotyledonous root
 - (2) Dicotyledonous stem
 - (3) Dicotyledonous root
 - (4) Monocotyledonous stem

72.	Select the correct statement.											
	(1)	Glucagon is associated with hypoglycemia.										
	(2)	Insulin acts on pancreatic cells and adipocytes.										
	(3)	Insulin is associated with hyperglycemia.										
	(4)	Glucocorticoids stimulate gluconeogenesis.										
73.	Montreal protocol was signed in 1987 for control of :											
	(1)	(1) Emission of ozone depleting substances										
	(2)	Relea	se of C	dreen H	Iouse g	gases						
	(3)	Dispo	salofe	e-waste	es							
LA	(4)			f Genet untry t		nodified organisms her						
74.		h the e ct opt		ving c	olumr	as and select the						
		Colu	mn - I			Column - II						
	(a)	6 - 15 gill sl	pairs its	of	(i)	Trygon						
	(b)	Heter cauda	ocerca al fin	ıl	(ii)	Cyclostomes						
	(c)	Air B	ladder		(iii)	Chondrichthyes						
	(d)	Poiso	n sting	g	(iv)	Osteichthyes						
		(a)	(b)	(c)	(d)							
	(1)	(iii)	(iv)	(i)	(ii)							
	(2)	(iv)	(ii)	(iii)	(i)							

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(4) (ii) (iii) (iv) (i)

(iv)

(3)

(i)

75. Identify the **wrong** statement with regard to Restriction Enzymes.

(iii)

(ii)

- (1) They cut the strand of DNA at palindromic sites.
- (2) They are useful in genetic engineering.
- (3) Sticky ends can be joined by using DNA ligases.
- (4) Each restriction enzyme functions by inspecting the length of a DNA sequence.

 76. Match the following with respect to meiosis: (a) Zygotene (b) Pachytene (ii) Chiasmata (c) Diplotene (iii) Crossing over (d) Diakinesis (iv) Synapsis 80. The ovary is half inferior in : (1) Mustard (2) Sunflower (3) Plum (4) Brinjal 	
(b)Pachytene (ii)Chiasmata(2)Sunflower(c)Diplotene (iii)Crossing over(3)Plum(t)Diplotene (iii)Crossing over(1)Plum	
(c) Diplotene (iii) Crossing over (3) Plum	
(d) Diakinesis (iv) Synapsis (4) Brinjal	
Select the correct option from the following :	
(a) (b) (c) (d) 81. Which one of the following is the most abundar protein in the animals?	int
$\begin{array}{cccc} (1) & (iv) & (iii) & (ii) \\ (2) & (i) & (ii) & (ii) \\ (1) & Collagen \end{array}$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
(4) Haemoglobin	
77. Cuboidal epithelium with brush border of microvilli is found in :	
(i) If the distance between two consecutive base pair	
 (1) ducts of salivary glands (2) proximal convoluted tubule of nephron is 0.34 nm and the total number of base pairs of DNA double helix in a typical mammalian cell 	
(3) eustachian tube 6.6×10^9 bp, then the length of the DNA	
(4) lining of intestine (4)	
(1) 2.5 meters	
78. Name the plant growth regulator which upon (2) 2.2 meters	
spraying on sugarcane crop, increases the length (3) 2.7 meters of stem, thus increasing the yield of sugarcane	
crop. (4) 2.0 meters	
(1) Gibberellin	
(2) Ethylene 83. The first phase of translation is :	
(3) Abscisic acid (1) Recognition of DNA molecule	
(4) Cytokinin (2) Aminoacylation of tRNA	
79. Match the following columns and select the (3) Recognition of an anti-codon	
correct option. (4) Binding of mRNA to ribosome	
Column - I Column - II	
(a) Bt cotton (i) Gene therapy C 84. Which of the following hormone levels will cause release of ovum (ovulation) from the graffia	
(b) Adenosine (ii) Cellular defence follicle ?	
deaminase (1) High concentration of Progesterone	
deficiency (2) Low concentration of LH	
(c) RNAi (iii) Detection of HIV (3) Low concentration of FSH infection	
(d) PCR (iv) Bacillus (4) High concentration of Estrogen	
thuringiensis 85. Flippers of Penguins and Dolphins are example	les
(a) (b) (c) (d) of:	
(1) (iii) (i) (iv) (1) Convergent evolution	
(2) (ii) (iv) (i) (2) Industrial melanism	
(3) (i) (ii) (iv) (3) Natural selection	
(4) (iv) (i) (ii) (iii) (4) Adaptive radiation	

						1	. 1						GI	
86.	Identify the wrong statement with reference to the gene 'I' that controls ABO blood groups.										, plast ons from		one facilitates the	
	(1)	A perso	n will ha	ave on	y two	of the three		(1)	Cytb	o _c f com	plex to	PS-I		
		alleles.						(2)		to NA				
	(2)					gether, they		(3)	PS-I	to ATI	P synth	ase		
	(-)	express			-			(4)	PS-I	I to Cy	tb ₆ f cor	nplex		
	(3)	Allele ʻi'				sugar.					Ū		_	
	(4)	The gen	e (I) has i	three a	lleles.		91.		oryolo oprove		suppo	ort fo	r evolution was	
87.	Selec	ct the optic	n includi	ng all s	exually	r transmitted		(1)	-	ed Wall	0.00			
	disea	ases.						(1) (2)		rles Da				
	(1)	Gonorrh	ioea, Mal	aria, G	enital	herpes		(2) (3)	Opai		1 W 111			
	(2)	AIDS, N	Ialaria, F	Filaria					-		von Ba			
	(3)	Cancer,	AIDS, Sy	philis				(4)	Karl	Ernst	von Ba	aer		
	(4)	Gonorrh	loea, Syp	hilis, G	enital	herpes	92.					and a	coelomate animals	
00	N	1. 1 6.	11			CHC HC)LA	are e	xempl	ified b	y :			
88.		ch the fo ect optior	0	colum	ns and	d select the		(1)	Platy	yhelmi	nthes			
	COII	-			0.1	11		(2)	Asch	lelmint	thes			
		Colum		/~	Con	ımn - II		(3)	Anne	elida				
	(a)	Eosinop	hils	(i)	Imm	une response		(4)	Cten	ophora				
	(b)	Basophi	ls	(ii)	Phag	gocytosis	93.	Which	h of th	e feller			als in promotion of	
	(c)	Neutrop	hils	(iii)	Relea	ase	95.	diure		le lono	wing w	ouia n	elp in prevention of	
				<	hista	minase,	1	(1) Reabsorption of Na ⁺ and water from renal						
				-	destr	ructive		(-)			e to aldo			
				NDIA	enzy	mes	1	(2)			at <mark>riu</mark> r	retic	factor causes	
	(d)	Lympho	cytes	(iv) Release granules						constri				
				1 /	conta	aining		(3)						
			histamine	histamine	histamine		(4) More water reabsorption due to undersecretion of ADH							
		(a) (k) (c)	(d)	A.				unae	ersecre	tion of .	ADH		
	(1)	(iv) (i)	(ii)	(iii)			94.	Mate	ch the	e follo	wing c	olum	ns and select the	
	(2)	(i) (ii) (iv)	(iii)			-	corr	ect op	tion.				
	(3)	(ii) (i)	(iii)	(iv)			जार्व		Colu	ımn -	I		Column - II	
	(4)	(iii) (iv	7) (ii)	(i)			N	(a)	Clos	tridiur	п	(i)	Cyclosporin-A	
00	N <i>T</i> 4	1 .1 .				, ·			buty	licum				
89.		n the trop ples in gr				rrect species		(b)	Tric	hodern	na	(ii)	Butyric Acid	
	(a)	Fourth t		-	(i)	Crow		(0)		sporun		(ш)	Dubynenen	
	(b)	Second t	-		(ii)	Vulture		(c)	Mon	ascus		(iii)	Citric Acid	
	(c)	First tro	phic leve	el	(iii)	Rabbit			purp	oureus				
	(d)	Third tr	ophic lev	el	(iv)	Grass		(d)	Aspe	ergillus	sniger	(iv)	Blood cholesterol	
	Sele	$\operatorname{ct}\operatorname{the}\operatorname{\mathbf{corr}}$	r ect opti	on :									lowering agent	
		(a) (k) (c)	(d)					(a)	(b)	(c)	(d)		
	(1)	(iii) (ii) (i)	(iv)				(1)	(ii)	(i)	(iv)	(iii)		
	(2)	(iv) (ii		(i)				(2)	(i)	(ii)	(iv)	(iii)		
	(3)	(i) (ii		(iv)				(3)	(iv)	(iii)	(ii)	(i)		
	(4)	(ii) (ii		(i)				(4)	(iii)	(iv)	(ii)	(i)		
				.,			I							

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95.	Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G_0). This process occurs at the end of :				Match the following columns and select t correct option.				
	(1)	G ₁ phase				umn -			Column - II
	(2)	Sphase		(a)	Pitu	itary g	land	(i)	Grave's disease
		-		(b)	Thyı	roid gla	and	(ii)	Diabetes mellitus
	(3)	G ₂ phase		(c)	Adre	enal gla	and	(iii)	Diabetes insipidus
	(4)	Mphase		(d)	Pano	creas		(iv)	Addison's disease
96.	are t	hich of the following techniques, the embryos ransferred to assist those females who cannot eive ?		(1) (2)	(a) (iii) (iii)	(b) (ii) (i)	(c) (i) (iv)	(d) (iv) (ii)	
	(1)	GIFT and ZIFT		(3)	(ii)	(i)	(iv)	(iii)	
	(2)	ICSI and ZIFT	NI A	(4)	(iv)	(iii)	(i)	(ii)	
	(3) GIFT and ICSI		100.	Whi	ph of th	ae follo	wing	statem	ents is correct ?
	(4)	ICSI and ZIFT GIFT and ICSI ZIFT and IUT	100	(1)	10	nine p			vmine through one
97.		ch of the following statements are true for ohylum-Chord <mark>ata</mark> ?		(2)		nine pa onds.	airs wi	th thy	nine through three
	(a)	In Urochordata notochord extends from	125-	(3)	Adeı	nine do	bes not	pair w	vith thymine.
		head to tail and it is present throughout their life.		(4)	Adeı H-bo	_	airs w	ith thy	vmine through two
	(b)) In Vertebrat <mark>a no</mark> tochord is present during the embryonic period only.		. Match the following concerning essential elements and their functions in plants :					
	(c)	Central nervous system is dorsal and hollow.		(a)	Iron	m 1	(i)		olysis of water
	(d)	Chordata is divided into 3 subphyla :	5	(b)	Zinc		(ii)	Polle	en germination
		Hemichordata, Tunicata and Cephalochordata.		(c)	Boro	n	(iii)	biosy	uired for chlorophyll ynthesis
	(1)	(c) and (a)	195	(d)		ganese			biosynthesis
	(2)	(a) and (b)		Sele		correc	-		
	(3)	(b) and (c)		(1)	(a)	(b)	(c)	(d)	
	(4)	(d) and (c)		(1) (2)	(iv) (iii)	(iii) (iv)	(ii) (ii)	(i) (i)	
				(2) (3)	(iiv)	(iv) (i)	(ii)	(i) (iii)	
98.	Snot	v-blindness in Antarctic region is due to :		(4)	(ii)	(i)	(iv)	(iii)	
00.	(1)	Inflammation of cornea due to high dose of UV-B radiation	102.	Whi	ch of	the fo	ollowin	ng is 1	not an inhibitory mancy?
	(2)	High reflection of light from snow		(1)		cisic ac	0	- ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	
	(3)	Damage to retina caused by infra-red rays		(2)		nolic ac			
	(4)	Freezing of fluids in the eye by low		(3)	Para	a-ascor	bic aci	d	
	× /	temperature		(4)	Gibb	erellic	acid		

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103.		n his experiments, S.L. Miller produced amino s by mixing the following in a closed flask :	109.				lindro: oRI is :	mic s	equence which is
	(1)	$ m CH_3, H_2, NH_4$ and water vapor at 800°C		(1)	5' - C	GAAG	CC - 3'		
	(2)	CH_4 , H_2 , NH_3 and water vapor at 600°C			3'- (CCTTO	GG - 5'		
				(2)		CTTAA			
	(3)	$ m CH_3, H_2, NH_3$ and water vapor at 600°C				FAATI			
	(4)	$\rm CH_4, \rm H_2, \rm NH_3$ and water vapor at 800°C		(3)		GATC			
				(1)					
104.	Expe	erimental verification of the chromosomal		(4)		HAATT TTAA			
	theo	ry of inheritance was done by :			3-0	IIAA	.G - 9		
	(1)	Sutton	110.				e t mate	eh.	
	(2)	Boveri		(1)	Pher	nylketo	nuria	-	Autosomal
	(3)	Morgan		(9)	Ciol-		anaem	÷	dominant trait Autosomal
	(4)	Mendel		(2)	SICK.	le cen	anaem	la -	recessive trait,
	(4)	Melider CHC	A I	6					chromosome-11
		Sour		(3)	Thal	assem	ia	-	Xlinked
105.		body of the ovule is fused within the funicle		(4)	Haer	nophil	ia	-	Y linked
	at :		111.	Ident	ify the	subst	ances h	aving	glycosidic bond and
	(1)	Micropyle			-			-	heir structure :
	(2)	Nucellus		(1)		erol, tr			
	(3)	Chalaza		(2)			ecithin		
	(4)	Hilum 🥑 🧹	2	(3)		in, insu			
				(4)	Chit	in, cho	lestero	1	
106.	Iden	tify the correct statement with reference to	112.	Thou	rocos	s of gr	owth is	movi	mum during :
2000		an digestive system.	112.	(1)		phase		шалі	in ann a annig .
	(1)	Serosa is the innermost layer of the		(1) (2)		scence			
	. ,	alimentary canal.		(3)	Dorr	nancy			
	(2)	Ileum is a highly coiled part.	~	(4)	Logi	phase			
	(3)	Vermiform appendix arises from duodenum.	113.	Mate	h the	e follo	wing o	olum	ns and select the
	(4)	Ileum opens into small int <mark>es</mark> tine.	-	corr	ect op				
			. El 9		Colu	ımn -	Ι		Column - II
107.	Diss duri	olution of the synaptonemal complex occurs		(a)	Orga	n of C	orti	(i)	Connects middle ear and pharynx
		-		(b)	Coch	lea		(ii)	Coiled part of the
	(1)	Zygotene		(0)	0001	104		(11)	labyrinth
	(2)	Diplotene		(c)	Eust	achiar	1 tube	(iii)	Attached to the
	(3)	Leptotene							oval window
	(4)	Pachytene		(d)	Stap	es		(iv)	Located on the
									basilar
108.	Flori	idean starch has structure similar to :							membrane
	(1)	Amylopectin and glycogen			(a)	(b)	(c)	(d)	
	(2)	Mannitol and algin		(1)	(iii)	(i)	(iv)	(ii)	
	(3)	Laminarin and cellulose		(2)	(iv)	(ii)	(i)	(iii)	
	(4)	Starch and cellulose		(3)	(i)	(ii)	(iv)	(iii) (i)	
	(-)			(4)	(ii)	(iii)	(i)	(iv)	

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- **114.** The process responsible for facilitating loss of water in liquid form from the tip of grass blades at night and in early morning is :
 - (1) Root pressure
 - (2) Imbibition
 - (3) Plasmolysis
 - (4) Transpiration
- **115.** Identify the **wrong** statement with reference to immunity.
 - (1) When ready-made antibodies are directly given, it is called "Passive immunity".
 - (2) Active immunity is quick and gives full response.
 - (3) Foetus receives some antibodies from mother, it is an example for passive immunity.
 - (4) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
- **116.** In water hyacinth and water lily, pollination takes place by :
 - (1) water currents only
 - (2) wind and water
 - (3) insects and water
 - (4) insects or wind
- 117. Which is the important site of formation of glycoproteins and glycolipids in eukaryotic cells?
 - (1) Peroxisomes
 - (2) Golgi bodies
 - (3) Polysomes
 - (4) Endoplasmic reticulum
- **118.** Which of the following regions of the globe exhibits highest species diversity ?
 - (1) Madagascar
 - (2) Himalayas
 - (3) Amazon forests
 - (4) Western Ghats of India
- **119.** Goblet cells of alimentary canal are modified from :
 - (1) Columnar epithelial cells
 - (2) Chondrocytes
 - (3) Compound epithelial cells
 - (4) Squamous epithelial cells

- **120.** Which of the following is **correct** about viroids ?
 - $(1) \qquad {\rm They\ have\ free\ RNA\ without\ protein\ coat.}$
 - (2) They have DNA with protein coat.
 - (3) They have free DNA without protein coat.
 - (4) They have RNA with protein coat.
- **121.** Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their :
 - (1) Growth response
 - (2) Defence action
 - (3) Effect on reproduction
 - (4) Nutritive value
- 122. Match the following columns and select the correct option.

	~?	Colu	mn - I			Column - II
	(a)	Place:	nta		(i)	Androgens
	(b)	Zonaj	pelluci	da	(ii)	Human Chorionic Gonadotropin (hCG)
	(c)		Bulbo-urethral lands Leydig cells		(iii)	Layer of the ovum
	(d)	Leydi			(iv)	Lubrication of the
		/ έ	51			Penis
		(a)	(b)	(c)	(d)	
	(1)	(i)	(iv)	(ii)	(iii)	
	(2)	(iii)	(ii)	(iv)	(i)	
	(3)	(ii)	(iii)	(iv)	(i)	
	(4)	(iv)	(iii)	(i)	(ii)	
123.	Ray f	lorets l	nave :			
	(1)	Super	rior ova	ary		

- (2) Hypogynous ovary
- (3) Half inferior ovary
- (4) Inferior ovary
- **124.** Which of the following is put into Anaerobic sludge digester for further sewage treatment ?
 - (1) Floating debris
 - (2) Effluents of primary treatment
 - (3) Activated sludge
 - (4) Primary sludge

125. The enzyme enterokinase helps in conversion of :	125.	The enzyme ente	erokinase hel	lps in conv	version of:
--	------	-----------------	---------------	-------------	-------------

- (1) trypsinogen into trypsin
- (2) caseinogen into casein
- (3) pepsinogen into pepsin
- (4) protein into polypeptides
- **126.** Match the following columns and select the **correct** option.

Column - I	Column - II
------------	-------------

- (a) Gregarious, polyphagous (i) Asterias pest
- (b) Adult with radial (ii) Scorpion symmetry and larva with bilateral symmetry
- (c) Book lungs
 (iii) Ctenoplana
 (d) Bioluminescence
 (iv) Locusta

(d)

- (a) (b) (c)
- (1) (iv) (i) (ii) (iii) (2) (iii) (ii) (i) (iv)
- (3) (ii) (i) (iii) (iv)
- (4) (i) (iii) (ii) (iv)
- 127. Presence of which of the following conditions in urine are indicative of Diabetes Mellitus?
 - (1) Uremia and Renal Calculi
 - (2) Ketonuria and Glycosuria
 - (3) Renal calculi and Hyperglycaemia
 - (4) Uremia and Ketonuria
- 128. Match the following columns and select the correct option.

	Colı	ımn -	I		Column - II			
(a)	Floa	loating Ribs		(i)	Located between			
					second and			
					$\operatorname{seventhribs}$			
(b)	Acromion			(ii)	Head of the			
					Humerus			
(c)	Scapula			(iii)	Clavicle			
(d)	Glenoid cavity		(iv)	Do not connect				
					with the sternum			
	(a)	(b)	(c)	(d)				
(1)	(i)	(iii)	(ii)	(iv)				
(2)	(iii)	(ii)	(iv)	(i)				
(3)	(iv)	(iii)	(i)	(ii)				
(4)	(ii)	(iv)	(i)	(iii)				

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- **129.** How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits ?
 - (1) 2
 - (2) 14
 - (3) 8
 - (4) 4
- **130.** If the head of cockroach is removed, it may live for few days because :
 - (1) the cockroach does not have nervous system.
 - (2) the head holds a small proportion of a nervous system while the rest is situated along the ventral part of its body.
 - (3) the head holds a 1/3rd of a nervous system while the rest is situated along the dorsal part of its body.
 - (4) the supra-oesophageal ganglia of the cockroach are situated in ventral part of abdomen.

131. Which of the following refer to **correct** example(s) of organisms which have evolved due to changes in environment brought about by anthropogenic action ?

- (a) Darwin's Finches of Galapagos islands.
- (b) Herbicide resistant weeds.
- (c) Drug resistant eukaryotes.
- (d) Man-created breeds of domesticated animals like dogs.
- (1) (a) and (c)
- (2) (b), (c) and (d)
- (3) only (d)
 - (4) only(a)
- 132. Identify the basic amino acid from the following.
 - (1) Glutamic Acid
 - (2) Lysine
 - (3) Valine
 - (4) Tyrosine
- **133.** In gel electrophoresis, separated DNA fragments can be visualized with the help of :
 - (1) Ethidium bromide in UV radiation
 - (2) Acetocarmine in UV radiation
 - (3) Ethidium bromide in infrared radiation
 - (4) Acetocarmine in bright blue light

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- **134.** The sequence that controls the copy number of the linked DNA in the vector, is termed :
 - (1) Ori site
 - (2) Palindromic sequence
 - (3) Recognition site
 - (4) Selectable marker
- **135.** The roots that originate from the base of the stem are :
 - (1) Primary roots
 - (2) Prop roots
 - (3) Lateral roots
 - (4) Fibrous roots
- **136.** The calculated spin only magnetic moment of Cr²⁺ ion is :
 - (1) 4.90 BM
 - (2) 5.92 BM
 - (3) 2.84 BM
 - (4) 3.87 BM
- 137. Match the following and identify the correct option.
 - (i) (a) $CO(g) + H_2(g)$ $Mg(HCO_3)_2 +$ $Ca(HCO_3)_2$ An electron (b) Temporary (ii) hardness of deficient hydride water B_2H_6 Synthesis gas (c) (iii) Non-planar (d) H_2O_2 (iv) structure

	(a)	(b)	(c)	(d)
(1)	(iii)	(ii)	(i)	(iv)
(2)	(iii)	(iv)	(ii)	(i)
(3)	(i)	(iii)	(ii)	(iv)
(4)	(iii)	(i)	(ii)	(iv)

- **138.** The mixture which shows positive deviation from Raoult's law is :
 - (1) Benzene + Toluene
 - (2) Acetone + Chloroform
 - (3) Chloroethane + Bromoethane
 - (4) Ethanol + Acetone

- 139. Identify the correct statement from the following :
 - (1) Blister copper has blistered appearance due to evolution of $\rm CO_2.$
 - (2) Vapour phase refining is carried out for Nickel by Van Arkel method.
 - (3) Pig iron can be moulded into a variety of shapes.
 - (4) Wrought iron is impure iron with 4% carbon.
- 140. Urea reacts with water to form A which will decompose to form B. B when passed through Cu^{2+} (aq), deep blue colour solution C is formed. What is the formula of C from the following?
 - (1) $[Cu(NH_3)_4]^{2+}$
 - (2) Cu(OH)₂
 - (3) $CuCO_3 \cdot Cu(OH)_2$
 - (4) $CuSO_4$
- 141. Hydrolysis of sucrose is given by the following reaction.

Sucrose + $H_2O \rightleftharpoons$ Glucose + Fructose

If the equilibrium constant (K_c) is 2×10^{13} at 300 K, the value of $\Delta_{\rm r} G^{\ominus}$ at the same temperature will be :

- (1) $8.314 \,\mathrm{J}\,\mathrm{mol}^{-1}\mathrm{K}^{-1} \times 300 \,\mathrm{K} \times \ln(2 \times 10^{13})$
- (2) 8.314 J mol⁻¹K⁻¹ × 300 K × ln(3 × 10¹³)
- (3) $-8.314 \,\mathrm{J}\,\mathrm{mol}^{-1}\mathrm{K}^{-1} \times 300 \,\mathrm{K} \times \ln(4 \times 10^{13})$
- (4) $-8.314 \text{ J mol}^{-1} \text{K}^{-1} \times 300 \text{ K} \times \ln(2 \times 10^{13})$

142. Identify the incorrect match.

	Name	IUP	AC Official Name
(a)	Unnilunium	(i)	Mendelevium
(b)	Unniltrium	(ii)	Lawrencium
(c)	Unnilhexium	(iii)	Seaborgium
(d)	Unununnium	(iv)	Darmstadtium
(1)	(b), (ii)		
(2)	(c), (iii)		
(3)	(d), (iv)		
(4)	(a), (i)		

143. Which of the following is a basic amino acid ?

- (1) Alanine
- (2) Tyrosine
- (3) Lysine
- (4) Serine

Sucrose on hydrolysis gives : 145. α -D-Glucose + β -D-Glucose (1)(1)(2) α -D-Glucose + β -D-Fructose (2)(3) α -D-Fructose + β -D-Fructose (3) β -D-Glucose + α -D-Fructose (4)(4)146. The number of Faradays(F) required to produce 20 g of calcium from molten CaCl₂ (Atomic mass of $Ca = 40 \text{ g mol}^{-1}$) is : 152. 2 (1)· P (2)3 (3)4 (1)1 (4)(2)(3)147. For the reaction, $2Cl(g) \rightarrow Cl_2(g)$, the correct option is: (4)(1) $\Delta_r H > 0$ and $\Delta_r S < 0$ 153. (2) $\Delta_{\rm r} {\rm H} < 0 \text{ and } \Delta_{\rm r} {\rm S} > 0$ $\Delta_r H < 0$ and $\Delta_r S < 0$ (3) $\Delta_{\rm r} H > 0$ and $\Delta_{\rm r} S > 0$ (4)(1)148. The following metal ion activates many enzymes, (2)participates in the oxidation of glucose to produce (3)ATP and with Na, is responsible for the transmission of nerve signals. (4)(1)Copper 154. (2)Calcium (1)(3)Potassium (4)Iron (2)(3)Identify the **incorrect** statement. (4)The transition metals and their compounds (1)are known for their catalytic activity due to 155. their ability to adopt multiple oxidation states and to form complexes. (a) (2)Interstitial compounds are those that are formed when small atoms like H, C or N (b) are trapped inside the crystal lattices of (c) metals. (d) (3)The oxidation states of chromium in CrO_4^{2-} (1)and $Cr_2O_7^{2-}$ are not the same. (2)(3) $Cr^{2+}(d^4)$ is a stronger reducing agent than (4) $Fe^{2+}(d^6)$ in water. (4)www.aimset.in

144. What is the change in oxidation number of carbon

 $CH_4(g) + 4Cl_2(g) \rightarrow CCl_4(l) + 4HCl(g)$

in the following reaction?

0 to + 4

0 to -4

-4 to +4

+4 to +4

(1)

(2)

(3)

(4)

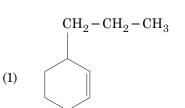
G1

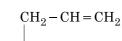
- 150. An increase in the concentration of the reactants of a reaction leads to change in :
 - (1)heat of reaction
 - (2)threshold energy
 - (3)collision frequency
 - (4)activation energy
- Reaction between benzaldehyde and acetophenone 151. in presence of dilute NaOH is known as :
 - Cannizzaro's reaction
 - Cross Cannizzaro's reaction
 - Cross Aldol condensation
 - Aldol condensation
- A tertiary butyl carbocation is more stable than a secondary butyl carbocation because of which of the following?
 - $+ R effect of CH_3 groups$
 - $R effect of CH_3 groups$
 - Hyperconjugation
 - -I effect of $-CH_3$ groups
- Find out the solubility of Ni(OH)₂ in 0.1 M NaOH. Given that the ionic product of $Ni(OH)_2$ is 2×10^{-15} .
 - $2 \times 10^{-8} \,\mathrm{M}$
 - $1 \times 10^{-13} \,\mathrm{M}$
 - $1 \times 10^8 \,\mathrm{M}$
 - $2 \times 10^{-13} \,\mathrm{M}$
- Identify a molecule which does not exist.
 - Li₂
 - C_2
 - 0_2
 - He,
- Elimination reaction of 2-Bromo-pentane to form pent-2-ene is :
 - **β**-Elimination reaction
 - Follows Zaitsev rule
 - Dehydrohalogenation reaction
 - Dehydration reaction
 - (a), (c), (d)
 - (b), (c), (d)
 - (a), (b), (d)
 - (a), (b), (c)

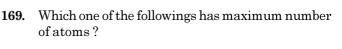
149.

G1		1	8						
156.						Which of the following oxoacid of sulphur has $-O-O-$ linkage?			
	(1)	Solubility		(1)	H_2S	O_4 , sul	phurio	c acid	
	(2)	Stability of the colloidal particles		(2)	H_2S_2	,0 ₈ , pe	roxodi	isulphuric acid	
	(3)	Size of the colloidal particles		(3)				ohuric acid	
	(4)	Viscosity		(4)				us acid	
157.	$^{175}_{71}$ L	number of protons, neutrons and electrons in u , respectively, are :	162.	The rate constant for a first order reaction is $4.606 \times 10^{-3} \text{ s}^{-1}$. The time required to reduce 2.0 g of the reactant to 0.2 g is :					
	(1)	104, 71 and 71		(1)	200 s	3			
	(2)	71, 71 and 104		(2)	$500\mathrm{s}$	3			
	(3)	175, 104 and 71		(3)	1000	s			
	(4)	71, 104 and 71		(4)	100 s				
158.		tify the correct statements from the wing:	163.	D.			wing	alkane cannot be made in	
	(a)	$CO_2(g)$ is used as refrigerant for ice-cream and frozen food.		good yield by Wurtz reaction ?(1) 2,3-Dimethylbutane					
	(b)	The structure of C ₆₀ contains twelve six		(2)	N 14	ptane	.y 10 ava		
		carbon rings and twenty five carbon rings.		(3)		tane			
	(c)	ZSM-5, a type of zeolite, is used to convert alcohols into gasoline.		(4)		xane			
	(d)	CO is colorl <mark>ess a</mark> nd odourless gas.	164.	Mot	ch the i	followi	na		
	(1)	(a) and (c) only	104.	Mau		/ ()	ng.	N .	
	(2)	(b) and (c) only			Oxid	le		Nature	
	(3)	(c) and (d) only		(a)	CO	2	(i)	Basic	
	(4)	(a), (b) and (c) only		(b)	BaO	ž /	(ii)	Neutral	
				(c)	Al_2O	3	(iii)	Acidic	
159.		element has a body centered cubic (bcc)		(d)	Cl_2O		(iv)	Amphoteric	
	structure with a cell edge of 288 pm. The atomic radius is :			Whi	ch of th	ne follo	wingi	s correct option ?	
					(a)	(b)	(c)	(d)	
	(1) $\frac{\sqrt{2}}{4} \times 288 \text{ pm}$			(1)	(ii)	(i)	(iv)	(iii)	
	(1)	4 200 pm		(2)	(iii)	(iv)	(i)	(ii)	
	(0)	$\frac{4}{}$ x 288 pm		(3)	(iv)	(iii)	(ii)	(i)	
		$rac{4}{\sqrt{3}} imes 288 ext{ pm}$							
	(3)	$rac{4}{\sqrt{2}} imes 288 ext{ pm}$	165.	(4)	(i)	(ii)	(iii)	(iv)	
	(4) $\frac{\sqrt{3}}{4} \times 288 \text{ pm}$			A mixture of N_2 and Ar gases in a cylinder contains 7 g of N_2 and 8 g of Ar. If the total pressure of the mixture of the gases in the cylinder is 27 bar, the partial pressure of N_2 is :					
160.	Pape	Paper chromatography is an example of :			atomi	c mass	es (in	$g mol^{-1}$): N = 14, Ar = 40]	
	(1)	Partition chromatography		(1)	$12\mathrm{ba}$	ar			
	(2)	Thin layer chromatography		(2)	15 ba				
	(3)	Column chromatography		(3)	18 ba				
	(4)	Adsorption chromatography		(4)	9 bai				
				111	- J Dal	-			

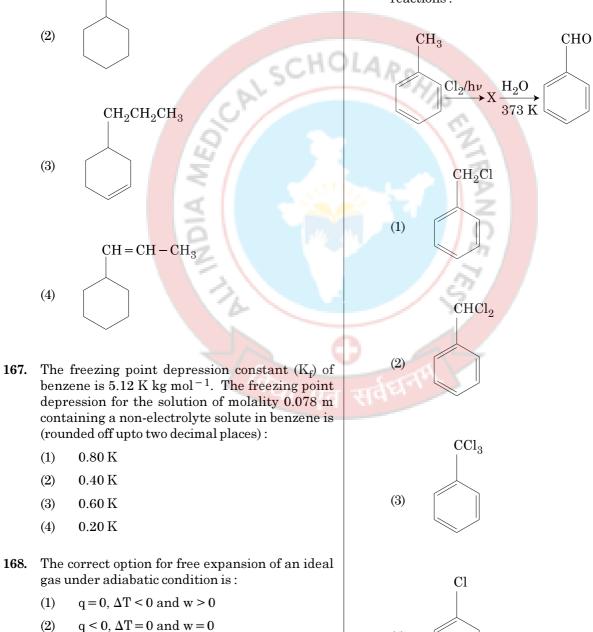
- 19
- **166.** An alkene on ozonolysis gives methanal as one of the product. Its structure is :







- (1) 1 g of Mg(s) [Atomic mass of Mg = 24]
- (2) $1 \operatorname{g} \operatorname{of} O_2(g)$ [Atomic mass of O = 16]
- (3) 1 g of Li(s) [Atomic mass of Li = 7]
- (4) $1 \operatorname{g} \operatorname{of} \operatorname{Ag}(s)$ [Atomic mass of Ag = 108]
- **170.** Identify compound X in the following sequence of reactions :



- (3) $q > 0, \Delta T > 0 \text{ and } w > 0$
- (4) $q = 0, \Delta T = 0 \text{ and } w = 0$

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(4)

	coord	lination compounds ?		(1)	It reduces oxygen carrying ability of blo
	(1)	$SCN^- < F^- < CN^- < C_2O_4^{2-}$		(2)	The carboxyhaemoglobin (haemoglo
	(2)	$F^- < SCN^- < C_2O_4^{2-} < CN^-$			bound to CO) is less stable th oxyhaemoglobin.
	(3)	$CN^- < C_2 O_4^{2-} < SCN^- < F^-$		(3)	It is produced due to incomplete combust
	(4)	$SCN^- < F^- < C_2O_4^{2-} < CN^-$		(4)	It forms carboxyhaemoglobin.
172.	Whie	ch of the following is a natural polymer ?			
	(1)	poly (Butadiene-styrene)	176.	Aniso	ble on cleavage with HI gives :
	(2)	polybutadiene			1P AL
	(3)	poly (Butadie <mark>ne-ac</mark> rylonitrile)			E
	(4)	cis-1,4-polyisoprene		(1)	+CH ₃ OH
173.		ch of the follo <mark>wing</mark> set of molecules will have dipole moment?	4		2
	(1)	Boron trifluor <mark>ide, h</mark> ydrogen fluoride, carbon dioxide, 1,3-dich <mark>lorob</mark> enzene			ОН
	(2)	Nitrogen trifluoride, beryllium difluoride, water, 1,3-dichlorobenzene	>	(2)	$+C_2H_5I$
	(3)	Boron trifluoride, beryllium difluoride, carbon dioxide, 1,4-dichlorobenzene	सव्		
	(4)	Ammonia, beryllium difluoride, water, 1,4-dichlorobenzene			I
174.	and	was passed through a solution of CaCl ₂ , MgCl ₂ NaCl. Which of the following compound(s) tallise(s) ?		(3)	$+C_2H_5OH$
	(1)	Only NaCl			ОН
	(2)	$\rm OnlyMgCl_2$			
	(3)	NaCl, MgCl_2 and CaCl_2		(4)	+ CH ₃ I
	(4)	$\operatorname{Both} \operatorname{MgCl}_2 \operatorname{and} \operatorname{CaCl}_2$			

171. Which of the following is the correct order of increasing field strength of ligands to form coordination compounds?

- 175. Which of the following is ${f not}$ correct about carbon monoxide?
 - lood.
 - lobin han
 - stion.

179. On electrolysis of dil.sulphuric acid using 177. Which of the following amine will give the Platinum (Pt) electrode, the product obtained at carbylamine test? anode will be : (1)Oxygen gas NHCH₃ (2) H_2S gas (3) SO_2 gas (1) (4)Hydrogen gas 180. Which of the following is a cationic detergent? (1)Sodium stearate $N(CH_3)_2$ Cetyltrimethyl ammonium bromide (2)O'CAL SCHO (3)Sodium dodecylbenzene sulphonate (2)(4)Sodium lauryl sulphate -000- $\mathrm{NHC}_{2}\mathrm{H}_{5}$ VIN (3) NH_2 (4)178. Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give : (1) Sec. butyl alcohol (2)Tert. butyl alcohol

21

- (3) Isobutyl alcohol
- (4) Isopropyl alcohol

22 Space For Rough Work



23 Space For Rough Work



Test Booklet Code

KANHA

No. :



This Booklet contains 24 pages.

Do not open this Test Booklet until you are asked to do so.

Important Instructions :

- 1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on **side-1** and **side-2** carefully with **blue/black** ball point pen only.
- 2. The test is of **3 hours** duration and Test Booklet contains **180** questions. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. The maximum marks are **720**.
- 3. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/marking responses.
- 4. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
- 5. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
- 6. The CODE for this Booklet is **H1**. Make sure that the CODE printed on Side-2 of the Answer Sheet is the same as that on this Test Booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
- 7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/ Answer Sheet.
- 8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
- 9. Each candidate must show on demand his/her Admit Card to the Invigilator.
- 10. No candidate, without special permission of the Superintendent or Invigilator, would leave his/her seat.
- 11. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign the Attendance Sheet twice. Cases where a candidate has not signed the Attendance Sheet second time will be deemed not to have handed over the Answer Sheet and dealt with as an unfair means case.
- 12. Use of Electronic/Manual Calculator is prohibited.
- 13. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
- 14. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
- 15. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

 Name of the Candidate (in Capitals) :

 Roll Number
 : in figures

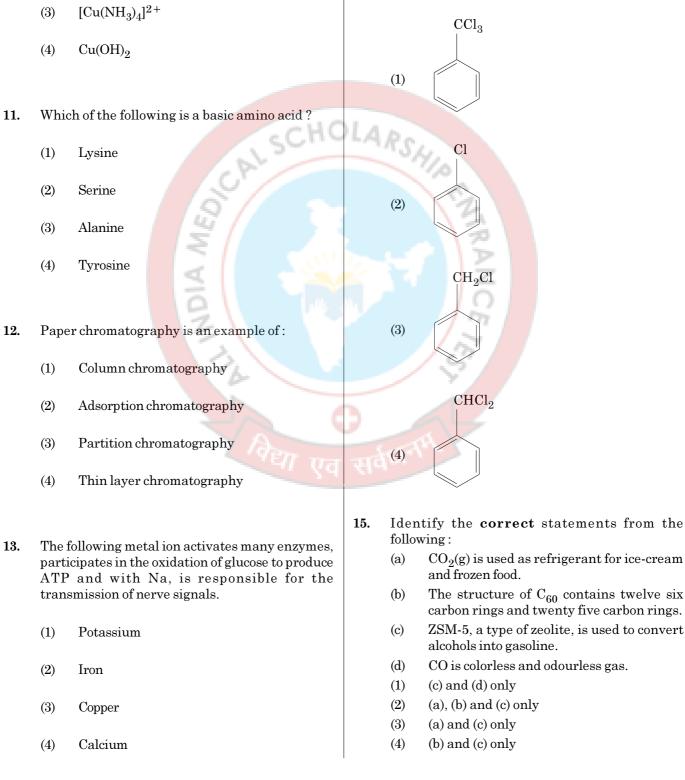
 : in words

 Centre of Examination (in Capitals) :

 Candidate's Signature :

 Facsimile signature stamp of

 Centre Superintendent :



- 10. Urea reacts with water to form A which will decompose to form **B**. **B** when passed through Cu^{2+} (aq), deep blue colour solution **C** is formed. What is the formula of **C** from the following?
 - $CuCO_3 \cdot Cu(OH)_2$ (1)
 - $CuSO_4$ (2)

14. Identify compound X in the following sequence of reactions:

373 K

CHO

 CH_3

 $\xrightarrow{\operatorname{Cl}_2/h\nu} X$

H1

H1

(1)

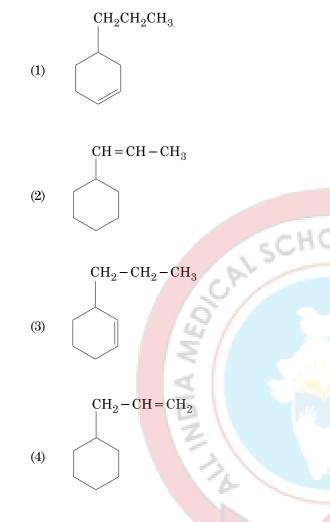
- 16. Which of the following alkane cannot be made in good yield by Wurtz reaction?
 - n-Butane (1)
 - (2)n-Hexane
 - (3)2,3-Dimethylbutane
 - n-Heptane (4)
- 17. Which of the following is a natural polymer?
 - (1)poly (Butadiene-acrylonitrile)
 - (2)cis-1,4-polyisoprene
 - (3)poly (Butadiene-styrene)
 - polybutadiene (4)
- On electrolysis of dil.sulphuric acid using 18. Platinum (Pt) electrode, the product obtained at anode will be :
 - (1) SO_2 gas
 - (2)Hydrogen gas
 - (3)Oxygen gas
 - (4)H₂S gas
- 19. Measuring Zeta potential is useful in determining which property of colloidal solution?
 - Size of the colloidal particles (1)
 - (2)Viscosity
 - (3)Solubility
 - Stability of the colloidal particles (4)
- HCl was passed through a solution of CaCl₂, MgCl₂ 20. and NaCl. Which of the following compound(s) crystallise(s)?
 - (1)NaCl, MgCl₂ and CaCl₂
 - (2)Both MgCl₂ and CaCl₂
 - Only NaCl (3)
 - Only MgCl₂ (4)

- 21. Which of the following amine will give the carbylamine test?

 $\rm NHC_2H_5$

- NH_2 (2)NHCH₃ (3)(4)22. The mixture which shows positive deviation from Raoult's law is : (1)Chloroethane + Bromoethane (2)Ethanol+Acetone Benzene + Toluene (3)Acetone + Chloroform (4)23. The calculated spin only magnetic moment of Cr^{2+} ion is : (1) $2.84\,\mathrm{BM}$ (2) $3.87\,\mathrm{BM}$ 4.90 BM (3)5.92 BM (4)
 - An increase in the concentration of the reactants 24. of a reaction leads to change in :
 - collision frequency (1)
 - (2)activation energy
 - (3)heat of reaction
 - threshold energy (4)

25. An alkene on ozonolysis gives methanal as one of the product. Its structure is :



26. An element has a body centered cubic (bcc) structure with a cell edge of 288 pm. The atomic radius is :

(1)
$$\frac{4}{\sqrt{2}} \times 288 \text{ pm}$$

(2) $\frac{\sqrt{3}}{4} \times 288 \text{ pm}$
(3) $\frac{\sqrt{2}}{4} \times 288 \text{ pm}$
(4) $\frac{4}{\sqrt{3}} \times 288 \text{ pm}$

- 27. Sucrose on hydrolysis gives :
 - (1) α -D-Fructose + β -D-Fructose
 - (2) β -D-Glucose + α -D-Fructose
 - (3) α -D-Glucose + β -D-Glucose
 - (4) α -D-Glucose + β -D-Fructose

- **28.** Which of the following is the **correct** order of increasing field strength of ligands to form coordination compounds?
 - (1) $CN^- < C_2O_4^{2-} < SCN^- < F^-$
 - (2) $SCN^- < F^- < C_2O_4^{2-} < CN^-$
 - (3) $SCN^- < F^- < CN^- < C_2O_4^{2-}$
 - (4) $F^- < SCN^- < C_2O_4^{2-} < CN^-$
- **29.** The number of Faradays(F) required to produce 20 g of calcium from molten $CaCl_2$ (Atomic mass of Ca = 40 g mol⁻¹) is :
 - (1) 4
 - (2) 1(3) 2
 - (4) 3
- **30.** Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give :
 - (1) Isobutyl alcohol
 - (2) Isopropyl alcohol
 - (3) Sec. butyl alcohol
 - (4) Tert. butyl alcohol
- **31.** Which of the following oxoacid of sulphur has -O-O- linkage?
 - (1) $H_2S_2O_7$, pyrosulphuric acid
 - (2) H_2SO_3 , sulphurous acid
 - (3) H_2SO_4 , sulphuric acid
 - (4) $H_2S_2O_8$, peroxodisulphuric acid
- **32.** What is the change in oxidation number of carbon in the following reaction ?

 $\mathrm{CH}_4(\mathbf{g}) + 4\mathrm{Cl}_2(\mathbf{g}) \longrightarrow \mathrm{CCl}_4(\mathbf{l}) + 4\mathrm{HCl}(\mathbf{g})$

- (1) 0 to -4
- (2) +4 to +4
- (3) 0 to + 4
- (4) -4 to +4
- **33.** Which of the following is a cationic detergent ?
 - (1) Sodium dodecylbenzene sulphonate
 - (2) Sodium lauryl sulphate
 - (3) Sodium stearate
 - (4) Cetyltrimethyl ammonium bromide

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6

[Use atomic masses (in g mol⁻¹): N = 14, Ar = 40]

- (1) 18 bar
- (2) 9 bar
- (3) 12 bar
- (4) 15 bar

35. Identify the **incorrect** statement.

- (1) The oxidation states of chromium in CrO_4^2 and $Cr_2O_7^{2-}$ are not the same.
- (2) $Cr^{2+}(d^4)$ is a stronger reducing agent than $Fe^{2+}(d^6)$ in water.
- (3) The transition metals and their compounds are known for their catalytic activity due to their ability to adopt multiple oxidation states and to form complexes.
- (4) Interstitial compounds are those that are formed when small atoms like H, C or N are trapped inside the crystal lattices of metals.
- **36.** Identify the **incorrect** match.

Name

Unnilunium (i) Mendelevium Unniltrium (ii) Lawrencium Unnilhexium (iii) Seaborgium

IUPAC Official Name

- (d) Unununnium (iv) Darmstadtium
- (1) (d), (iv)

(a)

(b)

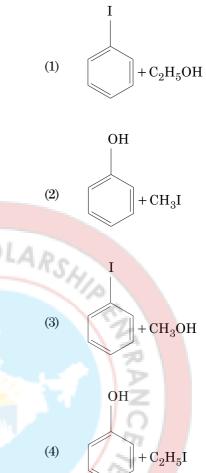
(c)

- (2) (a), (i)
- (3) (b), (ii)
- (4) (c), (iii)

37. Reaction between benzaldehyde and acetophenone in presence of dilute NaOH is known as :

- (1) Cross Aldol condensation
- (2) Aldol condensation
- (3) Cannizzaro's reaction
- (4) Cross Cannizzaro's reaction

38. Anisole on cleavage with HI gives :



- **39.** Find out the solubility of Ni(OH)₂ in 0.1 M NaOH. Given that the ionic product of Ni(OH)₂ is 2×10^{-15} .
 - (1) $1 \times 10^8 \,\mathrm{M}$
 - (2) $2 \times 10^{-13} \,\mathrm{M}$
 - (3) $2 \times 10^{-8} \,\mathrm{M}$
 - (4) $1 \times 10^{-13} \,\mathrm{M}$
- **40.** Elimination reaction of 2-Bromo-pentane to form pent-2-ene is :
 - (a) β -Elimination reaction
 - (b) Follows Zaitsev rule
 - (c) Dehydrohalogenation reaction
 - (d) Dehydration reaction
 - (1) (a), (b), (d)
 - (2) (a), (b), (c)
 - (3) (a), (c), (d)
 - (4) (b), (c), (d)

		· · · · · · · · · · · · · · · · · · ·	•				111	
41.	4.60	rate constant for a first order reaction is $6 \times 10^{-3} \text{ s}^{-1}$. The time required to reduce g of the reactant to 0.2 g is :	47.		p formed by using I		reed 'Hisardale' of ri ewes and Marino	
	(1)	1000 s		(1)	Inbreeding			
	(1)	100 s		(2)				
		200 s		(3)	Mutational breed	ing		
	(3)			(4)	Cross breeding	0		
	(4)	500 s			-			
42.	Ateı	rtiary butyl carbocation is more stable than a	48.		v-blindness in Anta		-	
	seco	ndary butyl carbocation because of which of		(1)	-		d by infra-red rays	
	the f	following?		(2)	temperature	lids in	the eye by low	
	(1)	Hyperconjugation		(3)	-	cornea	due to high dose of	
	(2)	$-I$ effect of $-CH_3$ groups		(-)	UV-B radiation			
	(3)	$+\mathrm{R}\mathrm{effect}\mathrm{of}-\mathrm{CH}_3\mathrm{groups}$		(4)	High reflection of	flightf	rom snow	
	(4)	$-R$ effect of $-CH_3$ groups	49.	Mot	ah the following	alum	ns and select the	
40	XX71 ·		45.		ect option.	corumi	is and select the	
43.		ch one of the followings has maximum number oms ?			Column - I		Column - II	
	(1)	1 g of Li(s) [Atomic mass of Li = 7]		(a)	Eosinophils	(i)	Immune response	
	(2)	1 g of Ag(s) [Atomic mass of Ag = 108]					_	
	(2)	1 g of Mg(s) [Atomic mass of Mg = 24]		(b)	Basophils	(ii)	Phagocytosis	
		1 g of $O_2(g)$ [Atomic mass of $N = 24$]	100	(c)	Neutrophils	(iii)	Release	
	(4)	$1 g \text{ of } O_2(g)$ [Atomic mass of $O = 10$]					histaminase,	
44.	Whie	ch of the following is not correct about carbon	N/		121		destructive enzymes	
	mon	oxide ?		(1)		(\cdot)	·	
	(1)	It is produced due to incomplete combustion.		(d)	Lymphocytes	(iv)	Release granules	
	(2)	It forms carboxyhaemoglobin.			\$		containing histamine	
	(3)	It reduces oxygen carrying ability of blood.			(a) (b) (c)	(d)	mstamme	
	(4)	The carboxyhaemoglobin (haemoglobin	3	(1)	(ii) (i) (iii)	(iv)		
		bound to CO) is less stable than oxyhaemoglobin.	_	(1)	(ii) (iv) (ii)	(i)		
			ज्यते	(3)	(iv) (i) (ii)	(iii)		
45.	The	number of protons, neutrons and electrons in		(4)	(i) (ii) (iv)	(iii)		
		u , respectively, are :						
	(1)	175, 104 and 71	50.		bili or cones are fou	ind in :		
	(1) (2)	71, 104 and 71		(1) (2)	Equisetum Salvinia			
		104, 71 and 71		(2) (3)	Salvinia Pteris			
	(3)			(3) (4)	Marchantia			
	(4)	71, 71 and 104		(4)	<i>Mar channa</i>			
46.		ater hyacinth and water lily, pollination takes e by :	51.	comp	oleted :		ondary oocyte is	
	(1)	insects and water		(1)		ision o	f a sperm with an	
	(2)	insects or wind		(2)	ovum Prior to ovulation			
	(3)	water currents only		(2) (3)	At the time of cop		1	
	(4)	wind and water		(3)	After zygote form		1	
	(-)			(1)	11001 2y 5000 101 III			

52. The QRS complex in a standard ECG represents :

- (1) Repolarisation of ventricles
- (2) Repolarisation of auricles
- (3) Depolarisation of auricles
- (4) Depolarisation of ventricles
- 53. If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately:

CALSCH

- (1) 2.7 meters
- (2) 2.0 meters
- (3) 2.5 meters
- (4) 2.2 meters
- 54. The plant parts which consist of two generations one within the other :
 - (a) Pollen grains inside the anther
 - (b) Germinated pollen grain with two male gametes
 - (c) Seed inside the fruit
 - (d) Embryo sac inside the ovule
 - (1) (a) and (d)
 - (2) (a) only
 - (3) (a), (b) and (c)
 - (4) (c) and (d)
- **55.** How many true breeding pea plant varieties did Mendel select as pairs, which were similar except in one character with contrasting traits ?
 - (1) 8
 - (2) 4
 - (3) 2
 - (4) 14

56. Match the following columns and select the correct option.Column - I

	Colu	1mn - 1	[Column - II
(a)	Clost	ridiun	n	(i)	Cyclosporin-A
	butyl	licum			
(b)	Trick	nodern	ıa	(ii)	Butyric Acid
	polys	porun	ı		
(c)	Mone	ascus		(iii)	Citric Acid
	purp	ureus			
(d)	Aspe	rgillus	niger	(iv)	Blood cholesterol
					lowering agent
	(a)	(b)	(c)	(d)	
(1)	(iv)	(iii)	(ii)	(i)	
(2)	(iii)	(iv)	(ii)	(i)	
(3)	(ii)	(i)	(iv)	(iii)	
(4)	(i)	(ii)	(iv)	(iii)	

57. Which of the following hormone levels will cause release of ovum (ovulation) from the graffian follicle ?

- (1) Low concentration of FSH
- (2) High concentration of Estrogen
- (3) High concentration of Progesterone
- (4) Low concentration of LH
- 58. Which of the following refer to **correct** example(s) of organisms which have evolved due to changes in environment brought about by anthropogenic action ?
 - (a) Darwin's Finches of Galapagos islands.
 - (b) Herbicide resistant weeds.
 - (c) Drug resistant eukaryotes.
 - (d) Man-created breeds of domesticated animals like dogs.
 - (1) only (d)
 - (2) only (a)
 - (3) (a) and (c)
 - (4) (b), (c) and (d)
- **59.** Which of the following statements are **true** for the phylum-Chordata?
 - (a) In Urochordata notochord extends from head to tail and it is present throughout their life.
 - (b) In Vertebrata notochord is present during the embryonic period only.
 - (c) Central nervous system is dorsal and hollow.
 - (d) Chordata is divided into 3 subphyla : Hemichordata, Tunicata and Cephalochordata.
 - (1) (b) and (c)
 - (2) (d) and (c)
 - (3) (c) and (a)
 - (4) (a) and (b)

8

(c) Cell wall material in (iii) Chitin fungi Gonadotropin (hCG) (d) Secondary metabolite (iv) Collagen Choose the correct option from the following : (c) Bulbo-urethral (iii) Layer of the ovum glands								9	9						H1
(a) Inhibitor of catalytic (i) Ricin activity (i) Ricin activity (i) Ricin activity (i) Ricin activity (i) Ricin (ii) Ricin (iii) Chinin fung (iii) Ricin (iii) Chinin fung (iii) Chinin fung (iii) Chinin (iii) (iii) (ii) (ii) (ii) (ii) (ii	60.	Mate	ch the :	followi	ng:				64.				wing	colum	ns and select the
6) Posees peptide bonds (i) Malonate (ii) Calagen (iii) C		(a)			fcataly	ytic	(i)	Ricin			Colu	umn -	I		Column - II
(i) $2 and period of a set of the following:function of thefunction of thefunction of thefunction of thefunction of thefunction of theglands(ii)2 \text{ and period of the following is(iii)(i)(ii)(iii)(ii)(ii)(iii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)(ii)$				-						(a)	Plac	enta		(i)	Androgens
Choose the correct option from the following: (a) (b) (c) (d) (i) (ii) (ii) (i) (ii) (ii) (i) (iii) (ii) (ii) (ii) (iii) (iv) (iii) (ii) (iii) (iv) (iii) (iii) (ii) (iv) (iii) (ii) (iii) (ii) (iv) (iii) (ii) (ii) (ii) (iv) (iii) (ii) (ii) (ii) (iii) (iv) (ii) (ii) (ii) (iii) (iv) (ii) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (iii) (ii) (ii) (ii) (ii) (iii) (ii)			Cell	wall m						(b)	Zona	a pelluc	ida	(ii)	-
Choose the correct option from the following :(a)(b)(c)(d)(a)(b)(c)(d)(b)(c)(d)(c)(ii)(ii)(c)(iii)(ii)(c)(iii)(iii)(c)<		(d)	Seco	ndary	metab	olite	(iv)	Collagen		(c)	Bulb	o-uret	nral	(iii)	Layer of the ovum
(a)(b)(c)(d)(c)(d)(c)(Choo	ose the	corre	ect opt	ion fro	m the f	following:			glan	ds			
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(c) (i) (ii) (iv) (i) (i) (d) (ii) (iv) (i) (ii) (e) (ii) (iv) (i) (ii) (f) (ii) (iv) (ii) (ii) (i) (ii) (iv) (ii) (i) (i) (ii) (i) (ii) (i) (i) (i) (ii) (i) (ii) (i) (i) (i) (ii) (ii) (i) (i) (i) (i) (ii) (ii) (i) (ii) (i) (i) (i) (ii) (ii) (i) (ii) (i) (i) (i) (ii) (ii) (i) (i) (i) (i) (i) (i) (i) (ii) (i) (i) (i) (i) (i) (i) (i)		(1)	(ii)	(iii)	(i)	(iv)					(a)	(b)	(c)	(d)	
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 (3) These are involved in ingestion of food particles. (1) Laminarin and cellulose (2) Starch and cellulose (3) Amylopectin and glycogen 		(2)	(2) They are not bound by any membrane				mbrane	67.	Flori	dean	starch	has st	ructur	e similar to :	
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(3) Amylopectin and glycogen						tion of food									
(4) Mannitol and algin		-											en		
		(4)	rney	и пе п.е	50 III U	1e Cy t0]	piasiii.			(4)	wan	initol a	na alg	IU	

H1					1	0							
68.			wing	colum	ns and select the	73.	The	enzym	e enter	okina	se help	s in co	onversion of :
	corr	ect option.					(1)	peps	inogen	into pe	epsin		
		Column -			Column - II		(2)	prote	ein into	polype	eptides	ł	
	(a)	6 - 15 pair gill slits	s of	(i)	Trygon		(3) trypsinogen into trypsin						
	(b)	Heterocero	ما	(ii)	Cyclostomes		(4)	casei	nogen	into ca	isein		
	(0)	caudal fin			Cyclostomes	74.	Mat	ch the	follov	wing c	columi	ns an	d select the
	(c)	Air Bladde	er	(iii)	Chondrichthyes		corr	ect op		_		_	
	(d)	Poison stir	ıg	(iv)	Osteichthyes				ımn - l				lumn - II
		(a) (b)	(c)	(d)			(a)	Greg pest	arious	polyp	hagous	s (i)	Asterias
	(1)	(i) (iv)	(iii)	(ii)			(b)		t with	nodial		(;;)	Scorpion
	(2)	(ii) (iii)	(iv)	(i)			(0)		netry a		va	(ii)	Scorpion
	(3)	(iii) (iv)	(i)	(ii)	SCHO	M A	~		bilater			7	
	(4)	4) (iv) (ii) (iii) (i) 50-11-5					(c)	Book	lungs			(iii)	Ctenoplana
69.	Prog	onco of whi		(d)	Biolu	umines	cence		(iv)	Locusta			
05.		resence of which of the following conditions in rine are indicative of Diabetes Mellitus ?) Renal calculi and Hyperglycaemia						(a)	(b)	(c)	(d)		
	(1)						(1)	(ii)	(i)	(iii)	(iv)		
	(2)	Uremia ar	nd <mark>Ket</mark> o	nuria			(2)	(i)	(iii)	(ii)	(iv)		
	(3)	Uremia ar	nd <mark>Ren</mark> a	al Calc	ali 🔍	17.5	(3)	(iv)	(i)	(ii)	(iii)		
	(4)	Ketonuria	a <mark>nd G</mark> l	ycosur	ia	-	(4)	(iii)	(ii)	(i)	(iv)		
70	T.J.	+:f +1 :		0			(1)	(III)	(11)	(1)	(11)		
70.		tify the inco		diam'r	ent. iins, resins, oils etc.,	75.				m witł	ı brush	borde	r of microvilli
	(1)	heart woo						and in	24 4				
	(2)	Heart woo mechanica			luct water but gives		(1) (2)		achian g of int				
	(3)				conduction of water		(3)		s of sali				
	. ,	and miner				Ľ.	(4)				-	ule of	nephron
	(4)	-			st secondary xylem	जार्द		prom		iivoiu	icu tub	uie oi	першоп
		and is ligh	ter in c	colour.		76.		-	-	suppo	ort fo	r evo	lution was
71.					the most abundant		_	prove	-				
	(1)	ein in the an Insulin	imais :				(1) (2)	Opar Karl	rın Ernst	von Be	or		
	(2)	Haemoglo	oin						ed Wall		aer		
	(3)	Collagen					(3)						
	(4)	Lectin					(4)	Char	les Da	rwin			
72.		Which of the following is not an inhibitory substance governing seed dormancy?						ry of in	herita				hromosomal
	(1)	Para-asco		d			(1)	Morg					
	(2)	Gibberelli					(2)	Meno					
	(3)	Abscisic ad					(3)	Sutto -					
	(4)	Phenolic a	cid				(4)	Bove	ri				

- **78.** Identify the **wrong** statement with reference to the gene 'I' that controls ABO blood groups.
 - (1) Allele 'i' does not produce any sugar.
 - (2) The gene (I) has three alleles.
 - (3) A person will have only two of the three alleles.
 - (4) When I^A and I^B are present together, they express same type of sugar.
- **79.** Identify the basic amino acid from the following.
 - (1) Valine
 - (2) Tyrosine
 - (3) Glutamic Acid
 - (4) Lysine
- **80.** Dissolution of the synaptonemal complex occurs during :
 - (1) Leptotene
 - (2) Pachytene
 - (3) Zygotene
 - (4) Diplotene
- 81. Some dividing cells exit the cell cycle and enter vegetative inactive stage. This is called quiescent stage (G_0). This process occurs at the end of :
 - (1) G_2 phase
 - (2) M phase
 - (3) G_1 phase
 - (4) S phase
- 82. Match the following columns and select the correct option.

Column - II Column - I (a) Pituitary gland (i) Grave's disease (b) Thyroid gland (ii) **Diabetes** mellitus (c) Adrenal gland (iii) **Diabetes** insipidus (d) Pancreas (iv) Addison's disease (a) (c) (d) **(b)**

(1)	(ii)	(i)	(iv)	(iii)
(2)	(iv)	(iii)	(i)	(ii)
(3)	(iii)	(ii)	(i)	(iv)
(4)	(iii)	(i)	(iv)	(ii)

- 83. Select the **correct** events that occur during inspiration.
 - (a) Contraction of diaphragm
 - (b) Contraction of external inter-costal muscles
 - (c) Pulmonary volume decreases
 - (d) Intra pulmonary pressure increases
 - (1) only(d)
 - (2) (a) and (b)
 - (3) (c) and (d)
 - (4) (a), (b) and (d)
- 84. The ovary is half inferior in :
 - (1) Plum
 - (2) Brinjal
 - (3) Mustard
 - (4) Sunflower
- 85. The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of :
 - (1) 1 molecule of 4-C compound and 1 molecule of 2-C compound
 - (2) 2 molecules of 3-C compound
 - (3) 1 molecule of 3-C compound
 - (4) 1 molecule of 6-C compound
- 86. Which of the following statements is not correct?
 - (1) Genetically engineered insulin is produced in *E-Coli*.
 - (2) In man insulin is synthesised as a proinsulin.
 - (3) The proinsulin has an extra peptide called C-peptide.
 - (4) The functional insulin has A and B chains linked together by hydrogen bonds.
- 87. Which of the following pairs is of unicellular algae?
 - (1) Chlorella and Spirulina
 - (2) Laminaria and Sargassum
 - (3) Gelidium and Gracilaria
 - (4) Anabaena and Volvox

- H1
- **88.** Choose the **correct** pair from the following :
 - Exonucleases Make cuts at specific positions within DNA
 Ligases - Join the two DNA
 - (2) Ligases Join the two DNA molecules
 (3) Polymerases Break the DNA into
 - fragments
 - (4) Nucleases Separate the two strands of DNA
- **89.** Identify the **wrong** statement with reference to immunity.
 - (1) Foetus receives some antibodies from mother, it is an example for passive immunity.
 - (2) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".
 - (3) When ready-made antibodies are directly given, it is called "Passive immunity".
 - (4) Active immunity is quick and gives full response.
- **90.** Which of the following would help in prevention of diuresis?
 - (1) Decrease in secretion of renin by JG cells
 - (2) More water reabsorption due to undersecretion of ADH
 - (3) Reabsorption of Na⁺ and water from renal tubules due to aldosterone
 - (4) Atrial natriuretic factor causes vasoconstriction
- **91.** The transverse section of a plant shows following anatomical features :
 - (a) Large number of scattered vascular bundles surrounded by bundle sheath.
 - (b) Large conspicuous parenchymatous ground tissue.
 - (c) Vascular bundles conjoint and closed.
 - (d) Phloem parenchyma absent.
 - Identify the category of plant and its part :
 - (1) Dicotyledonous root
 - (2) Monocotyledonous stem
 - (3) Monocotyledonous root
 - (4) Dicotyledonous stem

- 12
 - 92. Ray florets have :
 - (1) Half inferior ovary
 - (2) Inferior ovary
 - (3) Superior ovary
 - (4) Hypogynous ovary
 - **93.** Select the **correct** statement.
 - (1) Insulin is associated with hyperglycemia.
 - (2) Glucocorticoids stimulate gluconeogenesis.
 - (3) Glucagon is associated with hypoglycemia.
 - (4) Insulin acts on pancreatic cells and adipocytes.
 - **94.** Which of the following statements is **correct**?
 - (1) Adenine does not pair with thymine.
 - (2) Adenine pairs with thymine through two H-bonds.
 - (3) Adenine pairs with thymine through one H-bond.
 - (4) Adenine pairs with thymine through three H-bonds.

95. Which of the following is put into Anaerobic sludge digester for further sewage treatment ?

- (1) Activated sludge
- (2) Primary sludge
- (3) Floating debris
- (4) Effluents of primary treatment
- **96.** Name the plant growth regulator which upon spraying on sugarcane crop, increases the length of stem, thus increasing the yield of sugarcane crop.
 - (1) Abscisic acid
 - (2) Cytokinin
 - (3) Gibberellin
 - (4) Ethylene

						1	3						H1
97.	The are :		hat ori	iginate	e from t	he base of the stem	101.				0		with the causative ect option.
	(1)		eral roc						Colu	ımn -	I		Column - II
	(2)	Fibr	ousro	ots				(a)	Typł	oid		(i)	Wuchereria
	(3)		nary ro	oots									
	(4)	Prop	o roots					(b)	Pneı	umonia	l	(ii)	Plasmodium
98.			fic pa by Ec			equence which is		(c)	Filaı Mala	riasis		(iii)	Salmonella Haemophilus
	(1)	5' - (GAT	CC - 3'				(d)				(iv)	maemophilus
		3' - (CCTAC	GG - 5'					(a)	(b)	(c)	(d)	
	(2)	5' - (GAAT	ГС - З'				(1)	(iv)	(i)	(ii)	(iii)	
		3' - (CTTAA	AG - 5'				(2)	(i)	(iii)	(ii)	(iv)	
	(3)	5' - (GAA	CC - 3'				(3)	(iii)	(iv)	(i)	(ii)	
			CCTT		·	CHC	N I	(4)	(ii)	(i)	(iii)	(iv)	
	(4)		CTTAA			ALSCHO	- mad	ĸs,	ωN				
	36.		GAAT				102.				-		te of formation of in eukaryotic cells?
99.		ch the ect op		wing	colum	ns and select the		(1)	Poly	somes			
	0011	-	umn -	T	19	Column - II		(2)	End	oplasm	ic reti	culum	
	(a)	a) Floating Ribs			(i)	Located between		(3)	Pero	xisome	es		
	(a)	г юа	ung n	IDS	(1)	second and	12	(4)	Golg	i bodie	s		
					~	seventh ribs			Ū	10			
	(b)	Acro	mion		(ii)	Head of the	103.				lowing	is no	t an attribute of a
	(0)	11010	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		(11)	Humerus			lation	ALC: Y			
	(c)	Scap	ույթ		(iii)	Clavicle		(1)	Spec	ies inte	eractic	n	
		-	noid car			Do not connect		(2)	Sex	ratio			
	(d)	Glei	1010 Ca	vity	(iv)	with the sternum	D	(3)	Nata	ality			
		(a)	(b)	(c)	(d)	with the sternum		(4)	Mort	tality			
	(1)	(iv)	(iii)	(i)	(ii)					5			
	(2)	(ii)	(iv)	(i)	(iii)		104.			er of su 1 of cita			el phosphorylations
	(3)	(i)	(iii)	(ii)	(iv)			(1)	Thre			i cycic	15.
	(4)	(iii)	(ii)	(iv)	(i)					e			
100.	Ifthe	e head	of cocl	kroach	is rem	oved, it may live for		(2) (3)	Zero One				
	fewd	lays b	ecause	:		-		(4)	Two				
	(1)	whil		rest is		f a nervous system ed along the dorsal	105.	Montreal protocol was signed in 1987 for control					
	(2)	-		-	phage	al ganglia of the		of:					
		cock	roach			in ventral part of		(1) Disposal of e-wastes					
			omen.	.1. 7	1			(2)		-		-	modified organisms
	(3)					ave nervous system.				one co	-		
	(4)	(4) the head holds a small proportion of a nervor system while the rest is situated along the system where the system w						(3) Emission of ozone depleting substances					
		-			s body.	0		(4)	Rele	ase of (Green	House	gases

14

- **106.** Bilaterally symmetrical and acoelomate animals are exemplified by :
 - (1) Annelida
 - (2) Ctenophora
 - (3) Platyhelminthes
 - (4) Aschelminthes
- **107.** Identify the **wrong** statement with reference to transport of oxygen.
 - (1) Low pCO_2 in alveoli favours the formation of oxyhaemoglobin.
 - (2) Binding of oxygen with haemoglobin is mainly related to partial pressure of O₂.
 - (3) Partial pressure of CO_2 can interfere with O_2 binding with haemoglobin.
 - (4) Higher H⁺ conc. in alveoli favours the formation of oxyhaemoglobin.
- 108. Identify the **wrong** statement with regard to Restriction Enzymes.
 - (1) Sticky ends can be joined by using DNA ligases.
 - (2) Each restriction enzyme functions by inspecting the length of a DNA sequence.
 - (3) They cut the strand of DNA at palindromic sites.
 - (4) They are useful in genetic engineering.
- **109.** Which of the following is **correct** about viroids?
 - (1) They have free DNA without protein coat.
 - (2) They have RNA with protein coat.
 - (3) They have free RNA without protein coat.
 - (4) They have DNA with protein coat.
- **110.** The sequence that controls the copy number of the linked DNA in the vector, is termed :
 - (1) Recognition site
 - (2) Selectable marker
 - (3) Ori site
 - (4) Palindromic sequence

111. Match the following columns and select the **correct** option.

	corre	ect option.									
		Colu	mn - I			Column - II					
	(a)	Organ	n of Co	orti	(i)	Connects middle					
						ear and pharynx					
	(b)	Cochl	ea		(ii)	Coiled part of the					
						labyrinth					
	(c)	Eusta	ichian	tube	(iii)	Attached to the					
						oval window					
	(d)	Stape	s		(iv)	Located on the					
						basilar					
						membrane					
		(a)	(b)	(c)	(d)						
LA.	(1)	(i)	(ii)	(iv)	(iii)						
	(2)	(ii)	(iii)	(i)	(iv)						
	(3)	(iii)	(i)	(iv)	(ii)						
	(4)	(iv)	(ii)	(i)	(iii)						
112.	From	his exp	perime	e <mark>nts, S</mark> .	L. Mill	er produced amino					
						n a closed flask :					
	(1)	CH_3 ,	H ₂ , N	H ₃ and	l wate	r vapor at 600°C					
	(2)	$\operatorname{CH}_4,$	H ₂ , N	H ₃ and	l wate	r vapor at 800°C					
	(3)	CH_3 ,	H ₂ , N	H ₄ and	l wate	r vapor at 800°C					
	(4)	CH ₄ ,	H ₂ , N	H ₃ and	lwate	r vapor at 600°C					
113.	Whicl	n of the	follow	ving rea	gions o	f the globe exhibits					
				versity							
	(1)	Amaz	on for	ests							
	(2)			nats of [India						
	(3)		gascar	•							
	(4)	Hima	layas								
114.	Ident	ify the	corre	e ct sta	temen	t with reference to					
		-		system							
	(1)					es from duodenum.					
	(2)		-			ntestine.					
	(3)	Serosa is the innermost layer of alimentary canal.									
	(4)	Ileum	ı is a h	ighly o	coiled p	part.					
115.			-			developed by the					
		luction s resist		-	e of Baa	cillus thuringiensis					
	$(\mathbf{D}t)$ is (1)		t preda								
	(1) (2)		t preuz t pests								
	(2)		- posts								

- (3) Fungal diseases
- (4) Plant nematodes

116.	Selec	t the c	correc	e t mate	ch.		120.					oquinone facilitates the	
	(1)	Thal	assem	ia	-	X linked			sfer of e				
	(2)	Haer	nophil	ia	-	Y linked		(1)		to ATP	-		
	(3)	Pher	nylketo	nuria	-	Autosomal		(2)		to Cyt	0		
						dominant trait		(3)		₃ f comp		PS-1	
	(4)	Sick	le cell :	anaem	nia -	Autosomal recessive trait,		(4)	PS-I	to NAI) b t		
						chromosome-11	121.		rding sity is			May, the global species	
117.					Plasm	odium that enters		(1)	7 mil	lion			
			body					(2)	$1.5\mathrm{m}$	illion			
	(1)		e game	-	3			(3)	20 mi	llion			
	(2) Trophozoites					240	11.4	(4)	50 mi	llion			
	(3)	Spor	ozoites			SCIL	LA	Rs.	\sim				
	(4)	Fema	ale gar	netocy	tes	ALSCHO	122.					eparated DNA fragments he help of :	
118.	Thor	roduc	t(a) of r	ogetio	n cotob	yzed by nitrogenase		(1)					
110,						plants is/are :		(2)	Acetocarmine in bright blue light				
	(1) Ammonia and hydrogen						_	(3) Ethidium bro <mark>mide</mark> in UV radiation			e in UV radiation		
	(2)	(2) Ammonia al <mark>one</mark>					12	(4)	Aceto	carmi	ne <mark>in U</mark>	JV radiation	
	(3)	Nitra	ate alo	ne	0		N. /			0			
	(4)	Amn	nonia a	and oxy	ygen		123.	helix	during	g trans	scriptio	acilitates opening of DNA on.	
119.	Mate	ch the	e follo	wing o	colum	ns and select the		(1)	 C S 	polym	erase		
	corr	ect op	tion.					(2) DNA ligase(3) DNA helicase					
		Colu	ımn -	I	1	Column - II	b.						
	(a)	Bt co	otton		(i)	Gene therapy	Ľ	(4)	DNA	polym	erase		
	(b)		iosine iinase		(ii)	Cellular defence	124.	Match the following concerning essential element and their functions in plants :					
			iency					(a)	Iron		(i)	Photolysis of water	
	(c)	RNA	i		(iii)	Detection of HIV		(b)	Zinc		(ii)	Pollen germination	
						infection		(c)	Boror	1	(iii)	Required for chlorophyll biosynthesis	
	(d)	PCR			(iv)	Bacillus thuringiensis		(d)	Mang	ganese	(iv)	IAA biosynthesis	
				inuringiensis		Selec	t the ${f c}$	orrec	t optio	on :			
		(a)	(b)	(c)	(d)				(a)	(b)	(c)	(d)	
	(1)	(i)	(ii)	(iii)	(iv)			(1)	(iv)	(i)	(ii)	(iii)	
	(2)	(iv)	(i)	(ii)	(iii)			(2)	(ii)	(i)	(iv)	(iii)	
	(3)	(iii)	(ii)	(i)	(iv)			(3)	(iv)	(iii)	(ii)	(i)	
	(4)	(ii)	(iii)	(iv)	(i)			(4)	(iii)	(iv)	(ii)	(i)	

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SCHOLA

- **125.** Identify the **correct** statement with regard to G₁ phase (Gap 1) of interphase.
 - (1) Nuclear Division takes place.
 - (2) DNA synthesis or replication takes place.
 - (3) Reorganisation of all cell components takes place.
 - (4) Cell is metabolically active, grows but does not replicate its DNA.
- **126.** Secondary metabolites such as nicotine, strychnine and caffeine are produced by plants for their :
 - (1) Effect on reproduction
 - (2) Nutritive value
 - (3) Growth response
 - (4) Defence action
- **127.** Flippers of Penguins and Dolphins are examples of :
 - (1) Natural selection
 - (2) Adaptive radiation
 - (3) Convergent evolution
 - (4) Industrial melanism
- 128. The first phase of translation is :
 - (1) Recognition of an anti-codon
 - (2) Binding of mRNA to ribosome
 - (3) Recognition of DNA molecule
 - (4) Aminoacylation of tRNA
- **129.** Goblet cells of alimentary canal are modified from :
 - (1) Compound epithelial cells
 - (2) Squamous epithelial cells
 - (3) Columnar epithelial cells
 - (4) Chondrocytes
- **130.** Select the option including all sexually transmitted diseases.
 - (1) Cancer, AIDS, Syphilis
 - (2) Gonorrhoea, Syphilis, Genital herpes
 - (3) Gonorrhoea, Malaria, Genital herpes
 - (4) AIDS, Malaria, Filaria

- **131.** In which of the following techniques, the embryos are transferred to assist those females who cannot conceive ?
 - (1) GIFT and ICSI
 - (2) ZIFT and IUT
 - (3) GIFT and ZIFT
 - (4) ICSI and ZIFT
- **132.** In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is **correct** ?
 - (1) There is no relationship between Gross primary productivity and Net primary productivity.
 - (2) Gross primary productivity is always less than net primary productivity.
 - (3) Gross primary productivity is always more than net primary productivity.
 - (4) Gross primary productivity and Net primary productivity are one and same.
- **133.** Identify the substances having glycosidic bond and peptide bond, respectively in their structure :
 - (1) Inulin, insulin
 - (2) Chitin, cholesterol
 - (3) Glycerol, trypsin
 - (4) Cellulose, lecithin

134. Match the trophic levels with their **correct** species **examples** in grassland ecosystem.

(a)	Four	rth trop	phic lev	(i)	Crow	
(b)	Seco	nd trop	ohic lev	(ii)	Vulture	
(c)	First	troph	ic leve	(iii)	Rabbit	
(d)	Thir	d tropł	nic leve	el	(iv)	Grass
Selec	ct the c	correc	e t optio	on:		
	(a)	(b)				
(1)	(i)	(ii)	(iii)			
(2)	(ii)	(iii)	(iv)			

(iv)

(i)

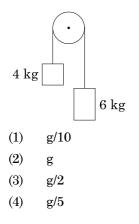
(3) (iii) (ii) (i) (4) (iv) (iii) (ii)

- Match the following with respect to meiosis: 135.
 - Zygotene Terminalization (a) (i)
 - (b) Pachytene Chiasmata (ii)
 - (c) Diplotene (iii) Crossing over
 - Diakinesis (d) (iv) Synapsis

Select the **correct** option from the following :

	(a)	(b)	(c)	(d)
(1)	(ii)	(iv)	(iii)	(i)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(i)	(ii)	(iv)	(iii)

- **136.** An electron is accelerated from rest through a potential difference of V volt. If the de Broglie wavelength of the electron is 1.227×10^{-2} nm, the potential difference is :
 - $10^4\,\mathrm{V}$ (1)
 - $10\,\mathrm{V}$ (2)
 - (3) $10^2 \,\mathrm{V}$
 - $10^3 \,\mathrm{V}$ (4)
- In Young's double slit experiment, if the separation 137. between coherent sources is halved and the distance of the screen from the coherent sources is doubled, then the fringe width becomes :
 - (1)one-fourth
 - (2)double
 - (3)half
 - (4)four times
- 138. Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is :



- - 139. The ratio of contributions made by the electric field and magnetic field components to the intensity of an electromagnetic wave is : (c = speed of electromagnetic waves)
 - $1:c^{2}$ (1)
 - (2)c:1
 - (3)1:1
 - 1:c(4)
 - 140. The mean free path for a gas, with molecular diameter d and number density n can be expressed as :

(1)
$$\frac{1}{\sqrt{2} n^{2} \pi^{2} d^{2}}$$

(2)
$$\frac{1}{\sqrt{2} n \pi d}$$

(3)
$$\frac{1}{\sqrt{2} n \pi d^{2}}$$

(4)
$$\frac{1}{\sqrt{2} n^{2} \pi d^{2}}$$

- 141. A series LCR circuit is connected to an ac voltage source. When L is removed from the circuit, the phase difference between current and voltage is $\frac{\pi}{3}$. If instead C is removed from the circuit, the phase difference is again $\frac{\pi}{3}$ between current and voltage. The power factor of the circuit is :
 - (1)-1.0
 - (2)zero
 - (3)0.5
 - (4)1.0
- 142. A ray is incident at an angle of incidence *i* on one surface of a small angle prism (with angle of prism A) and emerges normally from the opposite surface. If the refractive index of the material of the prism is μ , then the angle of incidence is nearly equal to:
 - (1) $\frac{2}{A}$ $\frac{2}{2\mu}$ 2A(2)(3)μ (4)μA
- 143. Taking into account of the significant figures, what is the value of 9.99 m - 0.0099 m?
 - 9.9 m (1)
 - (2)9.9801 m
 - (3)9.98 m
 - 9.980 m (4)

- 18
- 144. For which one of the following, Bohr model is **not** valid ?
 - (1) Singly ionised neon atom (Ne^+)
 - (2) Hydrogen atom
 - (3) Singly ionised helium atom (He^+)
 - (4) Deuteron atom
- 145. When a uranium isotope $^{235}_{92}$ U is bombarded with a neutron, it generates $^{89}_{36}$ Kr, three neutrons and :
 - (1) ${}^{103}_{36}$ Kr
 - (2) $^{144}_{56}$ Ba
 - (3) ${}^{91}_{40}$ Zr
 - (4) ${}^{101}_{36}$ Kr
- 146. In a certain region of space with volume 0.2 m³, the electric potential is found to be 5 V throughout. The magnitude of electric field in this region is :
 - (1) 5 N/C
 - (2) zero
 - (3) 0.5 N/C
 - (4) 1 N/C
- 147. Which of the following graph represents the variation of resistivity (ρ) with temperature (T) for copper ?

Т

- 148. Two cylinders A and B of equal capacity are connected to each other via a stop cock. A contains an ideal gas at standard temperature and pressure. B is completely evacuated. The entire system is thermally insulated. The stop cock is suddenly opened. The process is :
 - (1) isobaric
 - (2) isothermal
 - (3) adiabatic
 - (4) isochoric
- **149.** A resistance wire connected in the left gap of a metre bridge balances a 10 Ω resistance in the right gap at a point which divides the bridge wire in the ratio 3 : 2. If the length of the resistance wire is 1.5 m, then the length of 1 Ω of the resistance wire is :
 - (1) $1.5 \times 10^{-2} \text{ m}$
 - (2) 1.0×10^{-2} m
 - (3) $1.0 \times 10^{-1} \,\mathrm{m}$
 - (4) $1.5 \times 10^{-1} \,\mathrm{m}$

5

3

27

8 9

 $\frac{1}{3}$

2

(1)

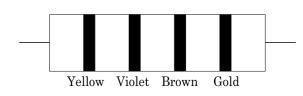
(2)

(3)

(4)

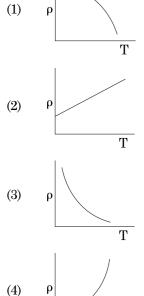
150. The quantities of heat required to raise the temperature of two solid copper spheres of radii r_1 and r_2 ($r_1 = 1.5 r_2$) through 1 K are in the ratio :

151. The color code of a resistance is given below :



The values of resistance and tolerance, respectively, are :

- (1) $470 \Omega, 5\%$
- (2) $470 \text{ k}\Omega, 5\%$
- (3) $47 \text{ k}\Omega, 10\%$
- (4) 4.7 k Ω , 5%



- **152.** The solids which have the negative temperature coefficient of resistance are :
 - (1) insulators and semiconductors
 - (2) metals
 - (3) insulators only
 - (4) semiconductors only
- **153.** For transistor action, which of the following statements is **correct** ?
 - (1) The base region must be very thin and lightly doped.
 - (2) Base, emitter and collector regions should have same doping concentrations.
 - (3) Base, emitter and collector regions should have same size.
 - (4) Both emitter junction as well as the collector junction are forward biased.
- 154. A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere ?

$$\left(\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2\right)$$

- (1) $1.28 \times 10^7 \text{ N/C}$
- (2) $1.28 \times 10^4 \text{ N/C}$
- (3) $1.28 \times 10^5 \,\text{N/C}$
- (4) $1.28 \times 10^6 \text{ N/C}$
- 155. Light of frequency 1.5 times the threshold frequency is incident on a photosensitive material. What will be the photoelectric current if the frequency is halved and intensity is doubled?
 - (1) zero
 - (2) doubled
 - (3) four times
 - (4) one-fourth
- **156.** Two particles of mass 5 kg and 10 kg respectively are attached to the two ends of a rigid rod of length 1 m with negligible mass.

The centre of mass of the system from the 5 kg particle is nearly at a distance of :

- (1) 80 cm
- (2) 33 cm
- (3) 50 cm
- (4) 67 cm

157. A wire of length L, area of cross section A is hanging from a fixed support. The length of the wire changes to L_1 when mass M is suspended from its free end. The expression for Young's modulus is :

(1)
$$\frac{\text{MgL}}{\text{A}(\text{L}_1 - \text{L})}$$
(2)
$$\frac{\text{MgL}_1}{\text{MgL}_1}$$

(2)
$$AL$$
(3)
$$\frac{Mg(L_1 - L)}{AL}$$

$$(4) \qquad \frac{\text{MgL}}{\text{AL}_1}$$

- 158. A charged particle having drift velocity of 7.5×10^{-4} m s⁻¹ in an electric field of 3×10^{-10} Vm⁻¹, has a mobility in m² V⁻¹ s⁻¹ of:
 - (1) 2.25×10^{-15}
 - (2) 2.25×10^{15}
 - (3) 2.5×10^6
 - (4) 2.5×10^{-6}
- **159.** Assume that light of wavelength 600 nm is coming from a star. The limit of resolution of telescope whose objective has a diameter of 2 m is :
 - (1) 6.00×10^{-7} rad
 - (2) 3.66×10^{-7} rad
 - (3) 1.83×10^{-7} rad
 - (4) 7.32×10^{-7} rad
- 160. Find the torque about the origin when a force of $3\hat{j}$ N acts on a particle whose position vector is $2\hat{k}$ m.
 - (1) $6\vec{k}$ N m
 - (2) $6\hat{i}$ N m
 - (3) $6\dot{j}$ N m
 - (4) $-6\hat{i}$ N m
- 161. Light with an average flux of 20 W/cm² falls on a non-reflecting surface at normal incidence having surface area 20 cm². The energy received by the surface during time span of 1 minute is :
 - (1) $48 \times 10^3 \,\mathrm{J}$
 - (2) $10 \times 10^3 \,\mathrm{J}$
 - (3) $12 \times 10^3 \,\mathrm{J}$
 - (4) $24 \times 10^3 \,\mathrm{J}$

162. A screw gauge has least count of 0.01 mm and there are 50 divisions in its circular scale.

The pitch of the screw gauge is :

- 1.0 mm (1)
- (2)0.01 mm
- (3)0.25 mm
- (4)0.5 mm
- 163. The capacitance of a parallel plate capacitor with air as medium is $6 \mu F$. With the introduction of a dielectric medium, the capacitance becomes $30 \,\mu\text{F}$. The permittivity of the medium is :

 $(\epsilon_0 = 8.85 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2})$

- (1)
- 5.00 C² N⁻¹ m⁻² 0.44×10⁻¹³ C² N⁻¹ m⁻² (2)
- $1.77 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$ (3)
- $0.44 \times 10^{-10} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$ (4)
- The energy equivalent of 0.5 g of a substance is : 164.
 - $0.5\!\times\!10^{13}\,\mathrm{J}$ (1)
 - $4.5 imes 10^{16} \, \mathrm{J}$ (2)
 - $4.5 imes 10^{13} \,\mathrm{J}$ (3)
 - $1.5 \times 10^{13} \,\mathrm{J}$ (4)
- 165. A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth?
 - (1)24 N
 - (2)48 N
 - 32 N (3)
 - (4)30 N
- 166. A ball is thrown vertically downward with a velocity of 20 m/s from the top of a tower. It hits the ground after some time with a velocity of 80 m/s. The height of the tower is : $(g = 10 \text{ m/s}^2)$
 - (1)300 m
 - (2)360 m
 - (3)340 m
 - 320 m (4)

- 167. A capillary tube of radius r is immersed in water and water rises in it to a height h. The mass of the water in the capillary is 5 g. Another capillary tube of radius 2r is immersed in water. The mass of water that will rise in this tube is :
 - (1) $20.0\,\mathrm{g}$

20

- (2) $2.5 \mathrm{g}$
- (3) $5.0 \mathrm{g}$
- (4) $10.0\,\mathrm{g}$
- 168. In a guitar, two strings A and B made of same material are slightly out of tune and produce beats of frequency 6 Hz. When tension in B is slightly decreased, the beat frequency increases to 7 Hz. If the frequency of A is 530 Hz, the original frequency of B will be :
 - (1) $537 \, \text{Hz}$
 - (2) $523\,\mathrm{Hz}$
 - $524\,\mathrm{Hz}$ (3)
 - (4)536 Hz
- 169. The increase in the width of the depletion region in a p-n junction diode is due to :
 - (1)increase in forward current
 - forward bias only (2)
 - (3)reverse bias only
 - (4)both forward bias and reverse bias
- 170. Dimensions of stress are :
 - $[ML^{-1}T^{-2}]$ (1)
 - (2) $[MLT^{-2}]$
 - (3) $[ML^2T^{-2}]$
 - $[ML^{0}T^{-2}]$ (4)
- 171. A short electric dipole has a dipole moment of 16×10^{-9} C m. The electric potential due to the dipole at a point at a distance of 0.6 m from the centre of the dipole, situated on a line making an angle of 60° with the dipole axis is :

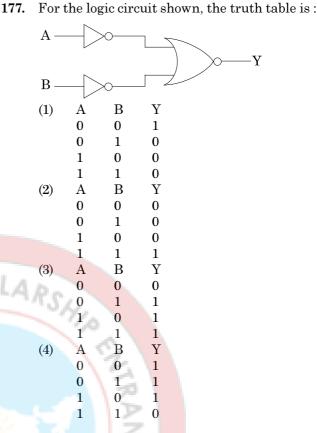
$$\begin{pmatrix} \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ N m}^2/\text{C}^2 \end{pmatrix}$$
(1) zero

- $50\,\mathrm{V}$ (2)
- $200\,\mathrm{V}$ (3)
- $400 \,\mathrm{V}$ (4)

- 172. The phase difference between displacement and acceleration of a particle in a simple harmonic motion is :
 - (1)zero
 - (2) π rad
 - $\frac{3\pi}{2}$ rad (3) $\frac{\pi}{2}$ rad (4)
- 173. A 40 μ F capacitor is connected to a 200 V, 50 Hz ac supply. The rms value of the current in the circuit is, nearly: CALSCH
 - (1) $25.1 \,\mathrm{A}$
 - (2) $1.7\,\mathrm{A}$
 - (3) $2.05 \,\mathrm{A}$
 - (4) $2.5 \,\mathrm{A}$
- **174.** An iron rod of susceptibility 599 is subjected to a magnetising field of $1200 \text{ A} \text{ m}^{-1}$. The permeability of the material of the rod is :
 - $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$
 - (1) $2.4\pi \times 10^{-7}$ T m A⁻¹
 - (2) $2.4\pi \times 10^{-4} \text{ T m A}^{-1}$
 - $8.0 \times 10^{-5} \,\mathrm{Tm} \,\mathrm{A}^{-1}$ (3)
 - $2.4\pi \times 10^{-5} \text{ T m A}^{-1}$ (4)
- 175. The Brewsters angle i_b for an interface should be :
 - $i_{b} = 90^{\circ}$ (1)
 - $0^{\circ} < i_{b} < 30^{\circ}$ (2)
 - $30^{\circ} < i_b < 45^{\circ}$ (3)
 - $45^{\circ} < i_b < 90^{\circ}$ (4)
- 176. A long solenoid of 50 cm length having 100 turns carries a current of 2.5 A. The magnetic field at the centre of the solenoid is :

 $(\mu_0 = 4\pi \times 10^{-7} \text{ T m A}^{-1})$

- $3.14 \times 10^{-5} \,\mathrm{T}$ (1)
- $6.28 \times 10^{-4} \,\mathrm{T}$ (2)
- $3.14 \times 10^{-4} \,\mathrm{T}$ (3)
- $6.28 \times 10^{-5} \,\mathrm{T}$ (4)



- 178. The average thermal energy for a mono-atomic gas is : (k_B is Boltzmann constant and T, absolute temperature)
 - k_BT (1) $\frac{1}{2}$ k_BT (2)k_BT (3) $\frac{5}{2}$ k_BT (4)
- 179. The energy required to break one bond in DNA is 10^{-20} J. This value in eV is nearly :
 - (1)0.006
 - (2)6
 - (3)0.6
 - 0.06 (4)
- 180. A cylinder contains hydrogen gas at pressure of 249 kPa and temperature 27°C.

Its density is : $(R = 8.3 \text{ J mol}^{-1} \text{ K}^{-1})$

- 0.02 kg/m^3 (1)
- 0.5 kg/m^3 (2)
- 0.2 kg/m^3 (3)
- (4) 0.1 kg/m^3

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22 Space For Rough Work



23 Space For Rough Work

