Test Booklet Code

VANI

No.: 6320962

This Booklet contains 24 pages.

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Test Booklet Code	E .
X	n and a second

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

Important Instructions:

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

Name of the Candidate (in Capitals):				
Roll Number : in figures	~* • •	•		
: in words				
Centre of Examination (in Capitals) :	Invisilet			
Candidate's Signature :	invignau	or s orginature	یہ ہے۔ ج	
Fascimile signature stamp or			÷	
Centre Supermiteritient	· · · · ·			

2 A spring of force constant k is cut into lengths of 6. Two rods A and B of different materials are welded ratio 1:2:3. They are connected in series and the together as shown in figure. Their thermal new force constant is k'. Then they are connected in conductivities are K₁ and K₂. The thermal parallel and force constant is k''. Then k' : k'' is : conductivity of the composite rod will be : **X**1) 1:9 KA AT (2)1:11(3)1:14(4)1:6The ratio of resolving powers of an optical microscope for two wavelengths $\lambda_1 = 4000$ Å and $\lambda_2 = 6000 \text{ Å is}$: (1)9:4 (1)(2)3:2 (3)16:81 (4)8:27 (2)The two nearest harmonics of a tube closed at one end and open at other end are 220 Hz and 260 Hz. What is the fundamental frequency of the system? 20 Hz (1)n = V40 30 Hz 40 Hz 10 Hz (4)4. Consider a drop of rain water having mass 1g falling from a height of 1 km. It hits the ground with a speed of 50 m/s. Take 'g' constant with a value A capacitor is charged by a battery. The battery is 10 m/s^2 . The work done by the (i) gravitational removed and another identical uncharged capacitor force and the (ii) resistive force of air is: (1) (i) 1.25 J (ii) $-8.25 \text{ J} = mq \times h$ is connected in parallel. The total electrostatic energy of resulting system : (ii) 8.75 J = $10^{-20} \times 10^{-20}$ (2)(i) 100 J decreases by a factor of 2 (1)**(**3) (i) 10 J (ii) −8.75 J (ii) -8.25 J (i) -10I(4) remains the same A physical quantity of the dimensions of length that (3) increases by a factor of 2 can be formed out of *c*, G and $\frac{e^2}{4\pi\epsilon_0}$ is [*c* is velocity (4)increases by a factor of 4 of light, G is universal constant of gravitation and e is charge] : (1) $c^{2}\left[G\frac{e^{2}}{4\pi\epsilon_{0}}\right]^{\frac{1}{2}}$ $F = \left(F\right)^{\frac{3}{2}}$ (1) (2) $\frac{1}{c^{2}}\left[\frac{e^{2}}{G4\pi\epsilon_{0}}\right]^{\frac{1}{2}}$ $\ell = \left(F\right)\left(\lfloor\tau^{-1}\right)^{\frac{3}{2}}$ 8. In a common emitter transistor amplifier the audio signal voltage across the collector is 3 V. The resistance of collector is $3 k\Omega$. If current gain is 100 and the base resistance is 2 k Ω , the voltage and power gain of the amplifier is V=B (1)15 and 200 $\frac{1}{c} G \frac{e^2}{4\pi\epsilon_0}$ (3) 150 and 15000 20 and 2000 (3) (4) $\frac{1}{c^2} \left[G \frac{e^2}{4\pi\epsilon_0} \right]^{\frac{1}{2}}$ 200 and 1000 (4)

· · ·

g Thermodynamic processes are indicated in the The given electrical network is equivalent to: a 12. A+B + A+B ed following diagram. íal ial Ð OR gate (1)NOR gate $(2\chi$ 700 K **(3)** NOT gate 500 K 300 K AND gate (4) Match the following: 13. The de-Broglie wavelength of a neutron in thermal equilibrium with heavy water at a temperature T Column-1 Column-2 (Kelvin) and mass m, is : P. Process I Adiabatic a. h Q. Process II Isobaric 🥌 b.-/3mkT R., Process III Isochoric -2h (2) S Process IV d. . Isothermal √3mkT $P \rightarrow c, Q \rightarrow a, R \rightarrow d, S \rightarrow b$ 2h (3) $P \rightarrow c$, $Q \rightarrow d$, $R \rightarrow b$, $S \rightarrow a$ ((2)√mkT $P \rightarrow d$, $Q \rightarrow b$, $R \rightarrow a$, $S \rightarrow c$ (3) h. (4) $P \rightarrow a, Q \rightarrow c, R \rightarrow d, S \rightarrow b$ √mkT (4) 14. Which one of the following represents forward Suppose the charge of a proton and an electron differ 10. bias diode? slightly. One of them is -e, the other is $(e + \Delta e)$. If ery is the net of electrostatic force and gravitational force icitor between two hydrogen atoms placed at a distance d (1)nergy (much greater than atomic size) apart is zero, then Δe is of the order of [Given mass of hydrogen Ne) $m_{\rm h} = 1.67 \times 10^{-27} \, \rm kg$] (2) m (1) 10^{-23} C 5 V (3) = m(m+A (2) 10⁻³⁷ C (3) 10^{−47} C -2 V 10⁻²⁰ C (4) 0. A long solenoid of diameter 0.1 m has 2×10^4 turns 15 The resistance of a wire is 'R' ohm. If it is melted l11. per meter. At the centre of the solenoid, a coil of and stretched to 'n' times its original length, its new audio 100 turns and radius 0.01 m is placed with its axis 12 resistance will be : The coinciding with the solehoid axis. The current in r'd Ringt ı is 100 the solenoid reduces at a constant rate to 0A from ge and 4 A in 0.05 s. If the resistance of the coil is $10 \ \pi^2 \Omega$, the total charge flowing through the coil during this time is : 16 µ C (1) (2) 32 µ C 16 π µC (3) (4) 32 π µC (4)nR

Two cars moving in opposite directions approach Preeti reached the metro station and found that the V/20. each other with speed of 22 m/s and 16.5 m/s (16. escalator was not working. She walked up the respectively. The driver of the first car blows a horn stationary escalator in time t_1 . On other days, if she having a frequency 400 Hz. The frequency heard remains stationary on the moving escalator, then by the driver of the second car is [velocity of sound the escalator takes her up in time t_2 . The time taken mg 400 × (340+16.5 340-22 340 m/s: by her to walk up on the moving escalator will be : ma 361 Hz (1)411 Hz (2)448 Hz (2)350 Hz (4) 12 (3) Two blocks A and B of masses 3m and m respectively are connected by a massless and inextensible string (4) Sal The whole system is suspended by a massles spring as shown in figure. The magnitudes c Young's double slit experiment is first performed in acceleration of A and B immediately after the strin air and then in a medium other than air. It is found that 8th bright fringe in the medium lies where 5th is cut, are respectively dark fringe lies in air. The refractive index of the **a** = nonnonna medium is nearly: rema 1.59 (1)1.69 1.78 (3) |3 m 1.25 (4) В m A beam of light from a source L is incident normally 18. ing on a plane mirror fixed at a certain distance x from the source. The beam is reflected back as a spot on a scale placed just above the source L. When the mirror is rotated through a small angle θ , the spot of the light is found to move through a distance y on the (2)scale. The angle θ_i is given by : (1)x (2) 2y A thin prism having refracting angle 10° is made (3) 22. glass of refractive index 1.42. This prism is combin with another thin prism of glass of refractive inc 1.7. This combination produces dispersion with deviation. The refracting angle of second pr If θ_1 and θ_2 be the apparent angles of dip observed should be: 19. in two vertical planes at right angles to each other, 5.= 52 10 ×0 MA2 6° then the true angle of dip θ is given by : $\tan^2\theta = \tan^2\theta_1 + \tan^2\theta_2$ 8° (1) (2) $\cot^2\theta = \cot^2\theta_1 - \cot^2\theta_2$ (2) (3) 10° $\tan^2\theta = \tan^2\theta_1 - \tan^2\theta_2$ (3) 4° (4) $\cot^2\theta = \cot^2\theta_1 + \cot^2\theta_2$ (4)

15 X roach The acceleration due to gravity at a height 1 km 27. Radioactive material 'A' has decay constant '8 λ ' 5 m/s 23. above the earth is the same as at a depth d below the and material 'B' has decay constant ' λ '. Initially a horn surface of earth. Then: they have same number of nuclei. After what time, $\frac{9}{9} \frac{1}{2} - \frac{2h}{p} = \frac{1}{2} \frac{1}{p}$ $(2) = \frac{d}{p}$ heard the ratio of number of nuclei of material 'B' to that sound d = 1 km(1)'A' will be $\frac{1}{2}$? $d = \frac{3}{2} km$ d = 2 km $d = \frac{1}{2} km$ (4)ectively 24. A potentiometer is an accurate and versatile device to make electrical measurements of E.M.F. because string. (4)the method involves : assless ides of potential gradients e string 28. The diagrams below show regions of equipotentials. a condition of no current flow through the (2)10 V .30 V 20 V 40 V 20 V galvanometer a combination of cells, galvanometer and (3) resistances . P======A() 10 (4) cells y 10 V 10 V 40 V 30 V 30 V 20 V(a) (b) (c)A spherical black body with a radius of 12 cm A positive charge is moved from A to B in each radiates 450 watt power at 500 K. If the radius were diagram. halved and the temperature doubled, the power (II) In all the four cases the work done is the same. radiated in watt would be : (2) Minimum work is required to move q in 450 (1) figure (a). 1000 (2)(3) Maximum work is required to move q in figure(b). 1800 (4) Maximum work is required to move q in 225 (4) figure (c). (29, Two astronauts are floating in gravitational free Figure shows a circuit that contains three identical 26. space after having lost contact with their spaceship. resistors with resistance $R = 9.0 \Omega$ each, two The two will : identical inductors with inductance L = 2.0 mHeach, and an ideal battery with emf $\varepsilon = 18$ V. The (1)move towards each other. current 'i' through the battery just after the switch (2) move away from each other. s made c closed is,..... will become stationary. (3)combine (4)keep floating at the same distance between tive inde m withou ≷R ≷R them. and prisi 30. The x and y coordinates of the particle at any time R are $x = 5t - 2t^2$ and y = 10t respectively, where x and y are in meters and t in seconds. The acceleration of the particle at t=2s is: 0.2 A (1)(1) 5 m/s^2 (2) 2 A $-4 \, {\rm m}/{\rm s}^2$ (2)(3) 0 ampere $-8 \, \text{m}/\text{s}^2$ (3) (4) $2 \, \text{mA}$ (4)0

х The bulk modulus of a spherical object is 'B'. If it is 34. One end of string of length *l* is connected to a particle 31. subjected to uniform pressure 'p', the fractional of mass 'm' and the other end is connected to a small decrease in radius is : peg on a smooth horizontal table. If the particle moves in circle with speed 'v', the net force on the particle (directed towards center) will be (T represents the tension in the string) (2)(1)B (3)3B (4) (3) Zero. (4) Т In an electromagnetic wave in free space the root mean square value of the electric field is $E_{rms} = 6V/m$. The peak value of the magnetic field A particle executes linear simple harmonic motion 32: is : with an amplitude of 3 cm. When the particle is at 2 cm from the mean position, the magnitude of its 2.83×10^{-8} T (1) velocity is equal to that of its acceleration. Then its (2) 0.70×10^{-8} T time period in seconds is : 4.23×10^{-8} T (3) 1.41×10^{-8} T (4) 2π A rope is wound around a hollow cylinder of mass 3 kg and radius 40 cm. What is the angular acceleration of the cylinder if the rope is pulled with a force of 30 N? 0.25 rad/s² (1) 25 rad/s^2 (4) (3) 5 m/s^2 25 m/s^2 (4) Two Polaroids P_1 and P_2 are placed with their axis perpendicular to each other. Unpolarised light I_0 is Two discs of same moment of inertia rotating about 37. incident on P1. A third polaroid P3 is kept in their regular axis passing through centre and between P_1 and P_2 such that its axis makes an angle perpendicular to the plane of disc with angular 45° with that of P₁. The intensity of transmitted light velocities ω_1 and ω_2 . They are brought into contact through P₂ is: face to face coinciding the axis of rotation. The expression for loss of energy during this process is 20 × 8 20 × 8 10 × 0 × 8 10 × 8 10 (1) $I(\omega_1-\omega_2)^2$ (1) (2) (2) $\frac{I}{8}(\omega_1-\omega_2)^2$ $\mathbf{I}_{\underline{0}}$ (3) (3) 16 $\frac{1}{2} \mathrm{I} \left(\omega_1 + \omega_2 \right)^2$ I₀ (4) 2

7 × 10-14 1 2 9.1×10 3 1200 2 2 9.1×10 31200 2 × 18 9 C 32×275 The photoelectric threshold wavelength of silver is 43. 38. fitis 3250×10^{-10} m. The velocity of the electron ejected ional from a silver surface by ultraviolet light of wavelength 2536×10^{-10} m is : middle wire 'B' is given by : (Given $h = 4.14 \times 10^{-15}$ eVs and $c = 3 \times 10^8$ ms⁻¹) (1) $\approx 0.6 \times 10^6 \,\mathrm{ms}^{-1}$ 12400 $\approx 61 \times 10^3 \text{ ms}^{-1}$ (2) $\approx 0.3 \times 10^{6} \text{ ms}^{-1}$ $\approx 6 \times 10^5 \,\mathrm{ms}^{-1}$ B² А A 250 - Turn rectangular coil of length 2.1 cm and 39. width 1.25 cm carries a current of 85 µA and (1) subjected to a magnetic field of strength 0.85 T. Work done for rotating the coil by 180° against the torque ie root eld is is : ic field 4.55 μ J (1) 2.3 µ] (2)1.15 µ J (3) 9.1 µ J (4) 2,0 (4) The ratio of wavelengths of the last line of Balmer 40. series and the last line of Lyman series is : 1,00 of mass (1) ingular 44. ed with (3)0.52 (4)the oil is³: A carnot engine having an efficiency of $\frac{1}{10}$ as heat engine, is used as a refrigerator. If the work done on Pa the system is 10 J, the amount of energy absorbed from the reservoir at lower temperature is : ng about 02 tre and 90 T (1) â angular 65 mm 99 T o contact Oil 100 ion. The 65 mm rocess is: (4) В A gas mixture consists of 2 moles of O2 and 4 moles 42. of Ar at temperature T. Neglecting all vibrational modes, the total internal energy of the system is :- $425 \, \text{kg m}^{-3}$ (1)DUE & U, CVIT+ U2CV 15 RT (1)(2)800 kg m 9 RT (2) $2 \times 5 R + 4 \times 3$ 928 kg m (3) 11 RT **4 RT** 650 kg m (4)

An arrangement of three parallel straight wires placed perpendicular to plane of paper carrying same current 'I' along the same direction is shown in Fig. Magnitude of force per unit length on the



A U tube with both ends open to the atmosphere, is partially filled with water. Oil, which is immiscible with water, is poured into one side until it stands at a distance of 10 mm above the water level on the other side. Meanwhile the water rises by 65 mm from its original level (see diagram). The density of



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Whic	h of the following statements are correct ?	50.	Func	tional megaspore in an angiosperm develo
(a)	Centre of mass of a body always coincides with the centre of gravity of the body γ		(1)	Endosperm
(b) ·	Contro of mass of a body is the point at which		, (2)	Embryo sac
(0)	the total gravitational torque on the body is		(3)	Embryo
,	zeró.		(4)	Ovule
(c)	A couple on a body produce both translational and rotational motion in a body.	51	Mve	lin sheath is produced by :
(d)	Mechanical advantage greater than one		(1)	Astrocytes and Schwann Cells
(u)	means that small effort can be used to lift a large load.		(1)	Oligodendrocytes and Osteoclasts 👂
(1)	(a) and (b)		(3)	Osteoclasts and Astrocytes »
(1)	(b) and (c)	1	(4)	Schwann Cells and Oligodendrocytes
(2)	(c) and (d)	152	Attr	actants and rewards are required for :
(0)		167	(AT)	Entomophily "
Ut I	(v) and (d)		(2)	Hydrophily
l Whic	h one of the following statements is correct,		(3)	Cleistogamy/
' with	reference to enzymes?		(4)	Anemophily •
(I)	Holoenzyme = Apoenzyme + Coenzyme		()	
(2)	Coenzyme = Apoenzyme + Holoenzyme y	53.	Rece	eptor sites for neurotransmitters are present of
(B)	Holoenzyme = Coenzyme + Co-factor		(1)	pre-synaptic membrane
(4)	Apoenzyme = Holoenzyme + Coenzyme φ		(2)	tips of axons
			(8)	post-synaptic membrane
A de the r	crease in blood pressure/volume will not cause elease of :		(4)	membranes of synaptic vesicles
(1)	Atrial Natriuretic Factor	54	. Coc	onut fruit is a :
(2)	Aldosterone		(1)	Berry
(-)			· (2)	Nut
(0)			(3)	Capsule
(4)	Kenin		£4)	Drupe
) Whi anti	ich cells of 'Crypts of Lieberkuhn' secrete bacterial lysozyme?	55	. Adu foll exp	alt human RBCs are enucleate. Which of owing statement(s) is/are most appropr lanation for this feature?
(1)	Paneth cells		(a)	They do not need to reproduce
(2)	Zymogen cells		(b)	They are somatic cells
(3)	Kupffer cells		(c)	They do not metabolize
(4)	Argentaffin cells		(d)	All their internal space is available for ∞ transport $$
9. Whi	ich of the following are not polymeric ?		Opi	tions:
(1)	Proteins _V .		(1)	Only (a)
(2)	Polysaccharides 🗸		(2)	(a), (c) and (d) •
(3).	Lipids		(3)	(b) and (c)
(4)	Nucleic acids «	I	(4)	Only (d) s

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levelop			9	_	X
R	Capac	citation occurs in :	61.7	Good rich f	l vision depends on adequate intake of carotene- ood
M.		Epididymis		Selec	t the best option from the following statements.
	(2) (2)	Vas deterens	· · ·	(a)	Vitamin A derivatives are formed from
	12 (3)	Female Reproductive tract		* .	carotene.
	(4)	Kete testis.		(b)	The photopigments are embedded in the membrane discs of the inner segment
7.	Whic	h of the following are found in extreme saline	a .a .a?		Datinal is a desirative of Vitamin A
٩	condi	itions?	-	·(C)	
7tes	(1)	Eubacteria		(d)	Retinal is a light absorbing part of all the visual photopigments. \checkmark
,	(2)	Cýanobacteria		Opti	ons:
	(3)	Mycobacteria		(1)	(a), (c) and (d) ,
	(4)	Archaebacteria	5	(2)	(a) and (c) 9
	Acvn	untote in a logistic growth curve is obtained		B	(b). (c) and (d) '
	wher			(4)	(a) and (b) α
»resent on	(1)	$\mathbf{K} = \mathbf{N}$		(4)	
	(2)	K>N-	62.	The	DNA fragments separated on an agarose gel
	(3)	K <n< td=""><td></td><td>can l</td><td>pe visualised after staining with :</td></n<>		can l	pe visualised after staining with :
	(4)	The value of 'r' approaches zero		(1)	Acetocarmine
	δ	and a state of the		(2)	Aniline blue
	7 Artii 7 milk	output represents :	2	(3)	Ethidium bromide
	J.	directional as it pushes the mean of the		(4)	Bromophenol blue
		character in one direction.	1		
	(2)	disruptive as it splits the population into two, one yielding higher output and the other	63.	The	hepatic portal vein drains blood to liver from :
Thich of the		lower output.	a da ang	(1)	Stomach
ipproprim	(3)	stabilizing followed by disruptive as it stabilizes the population to produce higher	•	(2)	Kidneys
		yielding cows.		(3)	Intestine
	(4)	stabilizing selection as it stabilizes this character in the population.		(4)	Heart
le for oxyg					
	Seleo	ct the mismatch :	64.	The	vascular cambium normally gives rise to :
	(r)	Rhodospirillum - Mycorrhiza		(1)	Primary phloem
	(2)	Anabaena - Nitrogen fixer 🗸	· · · ·	21)	Secondary xylem
	(3)	Rhizobium - Alfalfa	· · ·	(3)	Periderm
	(4)	Frankia - Alnus		(4)	Phelloderm
11.5			· •.		· · · · · · · · · · · · · · · · · · ·

and the second s	'	الاستي والمستعلم والمراجع المراجع المر المراجع المراجع	وستستنشب والمراجع فتحصص حالا محره الألاد الراب	hanna i i i _n g separa		
	v		4	Δ.		
	Ä	, 2, 2, 2, 2 , 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,				
	65.	Thalassemia and sickle cell a to a problem in globin mole	nemia are caused due	70. R	oot hairs develop i	rom the region of :
· · ·		the correct statement.	cule synthesis. Delect	(1	l) Elongation	
		(1) Detthere drug to a group	litative defection alabim	(2	2) Root cap	
	•	chain synthesis.		. (3	3) Meristematic	activity
		(2) Thalassemia is due to molecules.	less synthesis of globin	J.	4) Maturation	
· · ·		(3) Sickle cell anemia is problem of globin mol	due to a quantitative ecules. 🥪	(71.) A n	disease caused on-disjunction is :	by an autosomal prim
	.:	(4) Both are due to a qual	itative defect in globin	r -	() Klinofoltor's	Sundromo Va
,		chain synthesis.	0		() Kullerener st	Syncrome
4. 1	3	7	•	(2	2) Turner's Syn	drome 🐐
	66.	The genotypes of a Husband	and Wife are I ^A I ^B and	(3) Sickle Cell An	nemia 🍬
19 - L				· mal	Down's Synd	Irome 🗸
AA .		Among the blood types of the different genotypes and phe	eir children, how many notypes are possible ?	72 T	'he water potential	of pure water is
N P		(1) 3 genotypes ; 4 pheno	types 🗸	12. 1		
8		(2) 4 genotypes ; 3 pheno	types	. (.	$\frac{1}{2} \qquad \text{More than } zer$	o hut loss than one
		(3) 4 genotypes ; 4 pheno	types 👦	(
		(4) 3 genotypes ; 3 pheno	types .) (i	3) More than or	1 e
	67.	Which of the following fastomatal aperture?	acilitates opening of	(73. V	Vhich of the follow	wing options gives the c
		(1) Decrease in turgidity	of guard cellsy	ya. 1. 3		
	V	(2) Radial orientation of c the cell wall of guard	ellulose microfibrils in cells		f) condensation disassembly centromere	on \rightarrow nuclear memt \rightarrow arrangement at equat division \rightarrow segregatic
		(3) Longitudinal orier microfibrils in the cell	ntation of cellulose wall of guard cells b		telophase	
		(4) Contraction of outer v	vall of guard cells		2) condensation membrane c telophase v	$n \rightarrow crossing over \rightarrow ni$ lisassembly \rightarrow segregati
	168	In Bougainvillea thorns are t	he modifications of :	10 (3) condensation	\rightarrow arrangement at equa
	004	(1) Adventitious root \checkmark			centromere	division \rightarrow segregation
	· · ·	√ 2) Stem	•	 .	telophase	
a	Ŷ	(2) Loof		. (4) condensati	on \rightarrow nuclear meml
		(3) Lear	· · ·		disassembl	$y \rightarrow crossing ove$
	· · ·	(4) Stipules γ			segregation	\rightarrow telophase γ
	69.	Which one of the following conservation of threatened a	g is related to Ex-situ animals and plants?	74. 1 e	The process of se expressed protein b	paration and purificati before marketing is called
•. - •	. ·	(1) Biodiversity hot spots	Ŷ		1) Downstream	processing
	· · ·	(2) Amazon rainforest			2) Bioprocessin	g
		(3) Himalayan region	,		3) Postproduct	ion processing
		(4) Wildlife Safari parks			4) Upstream pr	ocessing
• .				1 (1997) 1997 1997	•	Ψ.
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7	5. A te is :	mporary endocrine gland in the human body	11 80.	X Which of the following in sewage treatment removes suspended solids ?
1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	(1)	Corpus cardiacum		(1) Secondary treatment
	(2)	Corpus luteum		(2) Primary treatment
	(3)	Corpus allatum	1	(3) Sludge treatment
	(4)	Pineal gland		(4) Tertiary treatment
	G MATH		-	
il prima		Collenshume	(81,)	An important characteristic that Hemichordates
a station		Phellom		share with Chordates is :
	(3)	Phloom	R	ventral tubular nerve cord
in the second	(0)	Yulom peronehyung		(2) pharynx with gill slits
	(4)	Aylem parenchyma		(3) pharynx without gill slits 🚀
/	7. An e	xample of colonial alga is :		(A) absence of notochord to the the termination of termina
- arthonolog	UT)	Volvox	00	
	(2)	Ulothrix	82.	from the experiments of :
	(3)	Spirogyra		(H) Hershev and Chase
e	(4)	Chlorella		(2) Avery Mcleod and McCarty
				(3) Hargohind Khorana
a a support of a	disea	ases (Column - I) with their causative agent		(4) Criffith
9 - 1 - 1	(Colu	umn - II) and select the correct option.		
s the corr		Column - I Column - II	83.	Among the following characters, which one was
	(a)	Gonorrhea (i) HIV		not considered by Mendel in his experiments on
membra	(b)	Syphilis (ii) Neisseria		
regation	(c)	Genital Warts (iii) Treponema		χ_1 functionities - Glandular or non-glandular χ_2
	(d)	AIDS (iv) Human		(2) Seed - Green or Yellow
$r \rightarrow nuc$	Onti	rapilloma - virus	i i	(3) Pod - Inflated or Constructed
gregation	Opti	(a) (b) (c) (d)		(4) Stem - Tall or Dwarf
at agrictor	(1)	$(\mathbf{i}) (\mathbf{i}) (\mathbf{i}) (\mathbf{i})$	(84.)	Plants which produce characteristic
gregation	(~)	$(\mathbf{i}\mathbf{y})$ $(\mathbf{i}\mathbf{i})$ $(\mathbf{i}\mathbf{j})$ $(\mathbf{i}\mathbf{i})$	QUC.	pneumatophores and show vivipary belong to :
,	(3)	$(\mathbf{i}\mathbf{v})$ $(\mathbf{i}\mathbf{i}\mathbf{i})$ $(\mathbf{i}\mathbf{i})$ $(\mathbf{i}\mathbf{i})$	e	(1) Halophytes
membr	(4)	$(ii) (iii) (iv) (i)^{\prime}$		(2) Psammophytes
g over				(3) Hydrophytes 🗴
	The IIUD'	function of copper ions in copper releasing s is :		(4) Mesophytes y
urification	(1)	They inhibit gametogenesis. 🌶	(85.)	The pivot joint between atlas and axis is a type of :
b callett.	(2)	They make uterus unsuitable for		(1) cartilaginous joint
	(3)	They inhibit ovulation	ĸ	synovial joint 1/2
	(4)	They suppress sperm motility and fertilising		(8) saddlejoint 🦿
-		capacity of sperms.		(4) fibrous joint y
× • .			•	
-				

:	6.			•		
				2	•	54
	X 86.	With photo	reference to factors affecting the rate of synthesis, which of the following statements	(91)	Fruit a by the	and leaf drop at early stages can be preven application of :
		is not	correct ((1)	Ethylene
		(1)	up to 0.05% can enhance CO_2 fixation rate	6	£2) . (2) {	Auxins Cibborellic acid
	r	, ⁽²⁾ .	C_3 plants respond to higher temperatures with enhanced photosynthesis while C_4 plants have much lower temperature optimum		(4)	Cytokinins y
•		(3)	Tomato is a greenhouse crop which can be grown in CO_2 - enriched atmosphere for higher yield	92,	male	frogs: Testes \rightarrow Vasa efferentia \rightarrow Kidne Cominal Vesicle \rightarrow Urinogenital duo
		(4)	Light saturation for CO_2 fixation occurs at 10% of full sunlight			Cloaca γ
	.017	יזארד	fragments are :		(2)	Testes \rightarrow Vasa efferentia \rightarrow Buder's \rightarrow \rightarrow Ureter \rightarrow Cloaca $\stackrel{\text{p}}{\sim}$
•	°0/•	w w	Negatively charged		(3)	Testes \rightarrow Vasa efferentia \rightarrow Kidne
		(2) ⁻	Neutral	· C		Bidder's canal \rightarrow Urinogenital du Cloaca
		(3)	Either positively or negatively charged depending on their size		(4)	Testes \rightarrow Bidder's canal \rightarrow Kidney \rightarrow efferentia \rightarrow Urinogenital duct \rightarrow Close
		(4)	Positively charged			
	88.	Whi cha	ich of the following components provides sticky racter to the bacterial cell ?	93.	. In ca low for f	ase of a couple where the male is having a sperm count, which technique will be su fertilisation ?
		(1)	Nuclear membrane y		(1)	Gamete intracytoplasmic fallopian tra
		(2)	Plasma membrane		(2)	Artificial Insemination
		(3)	Glycocalyx		(3)	Intracytoplasmic sperm injection \forall
	• .	(Å)	Cell wall	· · ·	(4)	Intrauterine transfer \wp
	89.	. Wł	tich of the following options best represents the	e (94.)	Wł	nich ecosystem has the maximum biomase
		(1)	amylase, pepsin, trypsinogen, maltase	. Cour	(1)	Grassland ecosystem
· · ·		(2)	peptidase, amylase, pepsin, rennin Y		(2)	Pond ecosystem
:	- 1	<i>(</i> 3)	lipase, amylase, trypsinoger	ι,	(3)	Lake ecosystem
			procarboxypeptidase		J(4)	Forest ecosystem
· · ·	90	(4)). W	amylase, peptidase, trypsinogen, remin φ hich among these is the correct combination o uatic mammals ?	of 95.	Lu do be	ngs are made up of air-filled sacs, the alveo not collapse even after forceful expi cause of :
		(1)	Dolphins, Seals, Trygon-p		(1)	Inspiratory Reserve Volume
		(2)	Whales, Dolphins, Seals		(2)	Tidal Volume
			Trygon, Whales, Seals Y		(3)) Expiratory Reserve Volume
		(4) Seals, Dolphins, Sharks φ		(4)	Y Residual Volume
		•				

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		1	13
prevente 6.	Prese layer in :	ence of plants arranged into well defined vertical s depending on their height can be seen best	1 101. Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by:
	(1)	Tropical Rain Forest	(1) Bee
	(2)	Grassland	(2) Wind
	(3)	Temperate Forest	
	(4)	Tropical Savannah	(3) Bat (4). Water
t sperms	• Whic	h of the following statements is correct 2	
Kidney va tal duct	(1)	The descending limb of loop of Henle is impermeable to water. φ	102. Transplantation of tissues/organs fails often due to non-acceptance by the patient's body. Which type of immune-response is responsible for such
lder's can	(2)	The ascending limb of loop of Henle is permeable to water. γ_{φ}	s rejections?
Kidney	(3)	The descending limb of loop of Henle is permeable to electrolytes. γ	(2) Hormonal immune response
tal duct	(4)	The ascending limb of loop of Henle is impermeable to water.	 (3) Physiological immune response (4) Autoimmune response
$ney \rightarrow Va$			(4) Autominiture response
	Alex time	ander Von Humbolt described for the first	t 103. Life cycle of <i>Ectocarpus</i> and <i>Fucus</i> respectively are:
ll be suital	(1)	تر Laws of limiting factor	(1) Dinloptic Hanladialantic
	2)	Species area relationships	(i) Lipionat, mapionipionat
vian transf	(3)	Population Growth equation	
	(4)	Ecological Biodiversity	(3) Haplodiplontic, Haplontic
∫m¥			(4) Haplontic, Diplontic
	Zygo	otic meiosis is characteristic of :	
piomass?	(1) (2)	Fucus Funaria 20	104) A gene whose expression helps to identify transformed cell is known as :
	(3)	Chlamydomonas	(1) Vector 🎢
	(4)	Marchantia	(2) Plasmid
			(3) Structural gene
þ	If the prote	ere are 999 bases in an RNA that codes for a ein with 333 amino acids, and the base at	a t (4) Selectable marker
ie alveoli. Il ul expirati	RNA	becomes 998 bases, how many codons will be	⁵ 105. A dioecious flowering plant prevents both :
	(1)	11 00 00	Autogamy and geitonogamy
	25	33 2 (22)	(2) Geitonogamy and xenogamy
Ų	(3)	333	(3) Cleistogamy and xenogamy
	(4)	1 -	(4) Autogamy and xenogamy

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	· .			• .•		
•	- '×					
· · ·	X		1	4		
	106.	Which	n statement is wrong for Krebs' cycle?	111.	What on ag	is the criterion for DNA fragments movement arose gel during gel electrophoresis ?
н I 2	γ		is reduced to $FADH_2 \checkmark$. t	(1)	The smaller the fragment size, the farther it moves
ч А.,	Ø	(2) 2	During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised		(2)	Positively charged fragments move to farther end
* * *	L L	(3)	The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid		(3) (4)	Negatively charged fragments do not move The larger the fragment size, the farther it moves
ι.		(4)	There are three points in the cycle where NAD ⁺ is reduced to NADH+H ⁺ \checkmark	112.	Нуре	rsecretion of Growth Hormone in adults does
NS S	107.	Phosp	phoenol pyruvate (PEP) is the primary CO ₂		not ca	use further increase in height, because : Epiphyseal plates close after adolescence.
R.	XIII -	accep	tor in :		(2)	Bones loose their sensitivity to Growth
	V	(1) (2)	C_4 plants			Hormone in adults.
¥.		(2)	C_2 plants		(3)	Muscle fibres do not grow in size after birth.
		(3)	C_3 and C_4 plants	•	(4) _y	, Growth Hormone becomes inactive in adults.
· .		(4)	C ₃ plants	113	DNA	replication in bacteria occurs :
	108.	Durir	ng DNA replication, Okazaki fragments are		(1)	Within nucleolus φ
	_	usea	to elongate :		(2)	Prior to fission
		(1)	The lagging strand towards replication fork.		(3)	Just before transcription
		(2)	fork.		(4)	During S phase 🌱
		(8)	The lagging strand away from the replication fork.	114.	Whic Meno	h one from those given below is the period for lel's hybridization experiments ?
		(4)	The leading strand towards replication fork.		(1)	1840 - 1850 🌶
na Na Sana Ang	09	Whic	th of the following RNAs should be most	· .	(2)	1857 - 1869
• •		abun		•	(3)	1870 - 1877 y
-			m-RNA *		الل ار	1856 - 1863
кл • М. с.	Ļ	(3)	mi-RNA 🖌	115.	Viroi	ds differ from viruses in having :
	Ma	,q(4)	r-RNA		(1)	DNA molecules without protein coat
	Č.	, .			(2)	RNA molecules with protein coat
	110.	GnR. repro	H, a hypothalamic hormone, needed in oduction, acts on :	Ĉ	(8) (4)	RNA molecules with protein coat
	Ľ	(IX)	anterior pituitary gland and stimulates secretion of LH and FSH.	116.	MAI	T constitutes about process control the
		(2)	posterior pituitary gland and stimulates secretion of oxytocin and FSH.		lymp	phoid tissue in human body.
		(3)	posterior pituitary gland and stimulates secretion of LH and relaxin.	Č	(1) <u>2e(2)</u> et	70%
	•	(4)	anterior pituitary gland and stimulates secretion of LH and oxytocin.		(3) (4)	10% 50%
					, .	

			15		, Arta	
117.	Whic prod	h of the following is correctly matched for the uct produced by them ?	122	Iden heart	tify the wron wood:	ng statement in context c
	(1)	Methanobacterium : Lactic acid 🦻		(1)	It is highly du	urable
	(2)	Penicillium notatum : Acetic acid		2	It conducts w	ater and minerals efficiently
v	ß	Sacchromyces cerevisiae : Ethanol		alay a	It comprises lignified wall	dead elements with highl
	(4)	Actionation acting Antipolicy		(4)	Organic com	oounds are deposited in it
118.	Whic cells, to pla oxyge	h among the following are the smallest living known without a definite cell wall, pathogenic ints as well as animals and can survive without en ?	123.	Anap degra of ani which	phase Promotir adation machine imal cells. If Al h of the followi	ng Complex (APC) is a protein ery necessary for proper mitosi PC is defective in a human cel ng is expected to occur?
	(1)	Pseudomonas		(1)	Chromosome	s will be fragmented
ŕ	(2)	Mycoplasma	· · ·	(2) ¹	Chromosome	s will not segregate
	(3)	Nostoc		(3)	Recombinatio occur	on of chromosome arms wil
	(4)	Bacillus	· a	(4)	Chromosome	s will not condense 🌶
119.	Whic	h of the following represents order of 'Horse'?	124.	Whic	h of the followi	ng cell organelles is responsible
· •	Ju -	Perissodactyla	· .	for ex	tracting energ	y from carbohydrates to form
	(2)	Caballus		AIP	ריית אינת	
•	(3)	Ferus		(1) (0)	Chlanalat	
	(4)	Equidae		(2) (21	Chioropiast	
(120)	Frog' to bea	s heart when taken out of the body continues It for sometime.		(4)	Lysosome	n
· ·	Select	the best option from the following statements.	125.	Мусо	rrhizae are the	example of :
	(a)	Frog is a poikilotherm.		(1)	Amensalism	
	(b)	Frog does not have any coronary circulation		(2)	Antibiosis	
	(c) ·	Heart is "myogenic" in nature		(3)	Mutualism	
	(d)	Heart is autoevcitable		(4)	Fungistasis	· · · · · ·
-	Ontic	me.				and the second
	(1)		126.	Outo	f 'X' pairs of ril ibs_Select the c	os in humans only 'Y' pairs are
•	(1) (2)	(a) and (b)		value	s of X and Y an	d provides their explanation :
	(2)	(a) = 1/1		(1)	X=12, Y=5	True ribs are attached
	(4)	Only (c)			n	dorsally to vertebral columr and sternum on the two ends
121.	Homo by :	ozygous purelines in cattle can be obtained	, , ,	(2) Y	X=24, Y=7	True ribs are dorsally attached to vertebral columr but are free on ventral side.
	(1)	mating of unrelated individuals of same breed.	н 	(3) - 7	X = 24, Y = 12	True ribs are dorsally attached to vertebral column
	(2)	mating of individuals of different breed. Y	ar.	n fe	N 10 N F	but are tree on ventral side.
	(3)	mating of individuals of different species.		(JA)	X = 12, Y = 7	Irue ribs are attached dorsally to vertebral column
	(4)	mating of related individuals of same breed.			· · ·	and ventrally to the sternum.

· . .

x			6		
127.	In ca flage	se of poriferans, the spongocoel is lined with llated cells called :	134.	The indic	association of histone H1 with a nucleosome cates :
	(1)	oscula		(1)	DNA replication is occurring
	(2)	choanocytes		(7)//	The DNA is condensed into a Chromatin
	(3)	mesenchymal cells	0		Fibre.
	(4)	ostia	-	(3)	The DNA double helix is exposed.
128.	Whic for a	h one of the following statements is not valid erosols?		(4)	: بر
	(1)	They alter rainfall and monsoon patterns	135.	The	region of Biosphere Reserve which is locally
ι	(2)	They cause increased agricultural productivity y		prote is kn	ected and where no human activity is allowed own as :
	(3)	They have negative impact on agricultural)- -	(1)	Buffer zone
	(4)	They are harmful to human health	ļ	(2)	Transition zone
				(3)	Restoration zone
129.	A bal and p obser	by boy aged two years is admitted to play school passes through a dental check - up. The dentist yed that the boy had twenty teeth Which teeth .		(4)	Core zone
	were	absent?	136.	Nam	e the gas that can readily decolouring acidified
	(1)	Canines		KMn	O ₄ solution :
	(2)	Pre-molars		-(1)	SO ₂
Ļ	(3)	Molars		(2)	NO ₂
	(4)	Incisors 🔊		(3)	PoOr Y
130.	Selec	t the mismatch :		(4)	
	(1)	Cycas - Dioecious - A		(1)	~~ <u>2</u> ¢
. '	(2)	Salvinia - Heterosporous	(137)	Mecl	hanism of a hypothetical reaction
QQ	9(3) 	Equisetum - Homosporous 7		X ₂ +`	$Y_2 \rightarrow 2 XY$ is given below :
	(4)	Pinus - Dioecious		(i)	$X_2 \rightarrow X + X \text{ (fast)}$
131.	The p cocor	morphological nature of the edible part of nut is :		(ii)	$X+Y_2 \Rightarrow XY+Y (slow)$
	(1)	Cotyledon		(iii)	$X_{+} + Y_{-} \rightarrow XY$ (fast)
L	£1	Endosperm		The o	verall order of the reaction will be:
	(3)	Pericarp	1	(1)	2 [XJ[Y2]
	(4)	Perisperm		(2)	0 ×2 3 (12)
132.	Doub	ble fertilization is exhibited by :		(3)	1.5 [X2] X
	(1)	Algae		(4)	1
	(2)	Fungi		(-7	(1***)
,	(3)	Angiosperms	138.	The e	element $Z = 114$ has been discovered recently.
	(4)	Gymnosperms		It will and e	l belong to which of the following family/group lectronic configuration ?
(133).	Splice	eosomes are not found in cells of :		(1)	Carbon family, [Rn] $5f^{14} 6d^{10} 7s^2 7p^2$
	(II) (2)	Animala		(2)	Oxygen family, [Rn] $5f^{14} 6d^{10} 7s^2 7p^4$
	(4) (3) A	Bacteria	,	(3)	Nitrogen family, [Rn] $5f^{14} 6d^{10} 7s^2 7p^6$
Ċ	(4)	Plants		(4)	Halogen family. [Rn] 5f ¹⁴ 6d ¹⁰ 7e ² 7n ⁵
	17.		(P)	17	

	117:	Whi	ch of the following is correctly matched for the	15	т 1		X
1.11		proc	luct produced by them?	Ser	hear	twood:	ng statement in context of
	, e	_(1)	Methanobacterium : Lactic acid 🦌		(1)	It is highly du	urable
		(2)	Penicillium notatum : Acetic acid 🦻	C		It conducts w	ater and minerals efficiently 🞾
ر. در معید دور در در در	د د	(3) (4)	Sacchromyces cerevisiae : Ethanol Acetobacter aceti : Antibiotics Y	C	all's a	It comprises lignified wall	dead elements with highly s
· · · ·					(4)	Organic comp	oounds are deposited in it
a and the second se	118.	Whi cells	ch among the following are the smallest living known without a definite cell wall, pathogenic	123.	Ana _I degra	phase Promotin adation machine	g Complex (APC) is a protein Pry necessary for proper mitosis
, B Barris - La San San San San San San San San San Sa		to pl oxyg	ants as well as animals and can survive without en ?		of an whic	imal cells. If AI h of the followin	PC is defective in a human cell, ng is expected to occur?
- - 		(1)	Pseudomonas		(1)	Chromosome	s will be fragmented
	X	2)	Mycoplasma		(2) ¹	Chromosome	s will not segregate
		(3) (4)	Nostoc		(3)	Recombinatic occur	on of chromosome arms will
		(4)	Бисиция	- · ·	(4)	Chromosome	s will not condense 🌶
	119.	Whic	ch of the following represents order of 'Horse'?	124.	Whic	h of the followir	ng cell organelles is responsible
	N	JU-	Perissodactyla		for ex	stracting energy	y from carbohydrates to form
		(2)	Caballus	5	ATP	?	
		(3)	Ferus			Ribosome	
		(4)	Equidae		(2) (21)	Chloroplast	
	(120)	Frog	's heart when taken out of the body continues	Ű	(4)	Lysosome	n
		Selec	t the best option from the following statements	125.	Myco	orrhizae are the	example of :
	No. 1	(a)	Frog is a poikilotherm		(1)	Amensalism	
×.		(b) (b)	Frog does not have any coronary circulation		(2)	Antibiosis	
		(c)	Heart is "myogenic" in nature	١.	(3)	Mutualism	
		(d)	Heart is autoexcitable &		(4)	Fungistasis	
		Opti	ons:	100	Övren	C/N/ C -1	
		(1)	Only (d)	140,	true r	ibs. Select the o	ption that correctly represents
		(2)	(a) and (b)	• " •	value	s of X and Y and	d provides their explanation :
	· · · · · · · · · · · · · · · · · · ·	(3)	(c) and (d)	4 • •	(1)	X=12, Y=5	True ribs are attached
14 7 16 1 17 -		(4)	Only (c)		به د		and sternum on the two ends.
	121.	Hom	ozygous purelines in cattle can be obtained	- - -	(2) Y	X=24, Y=7	True ribs are dorsally attached to vertebral column
		by:		ta îna și A și îna a A		V-04 V 10	but are free on ventral side.
		(I) (n)	breed.		(3) P	$\lambda = 24, Y = 12$	attached to vertebral column
		(2)	mating of individuals of different breed. Y	N	26	X = 12, Y = 7	True ribs are attached
		(3) (4)⁄	mating of individuals of different species.				dorsally to vertebral column and ventrally to the sternum.
						8	
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	······································						

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V		<i>c</i>	Sec. (1997)
A	- · · · · · · · · · · · · · · · · · · ·	.6	· · · · · · · · · · · · · · · · · · ·
127.	In case of poriferans, the spongocoel is lined with flagellated cells called :	134.	The association of histone H1 with a nucleosome indicates :
	(1) oscula		(1) DNA replication is occurring.
τ.	(2) choanocytes		(2) The DNA is condensed into a Chromotin
	(3) mesenchymal cells	0	Fibre.
	(4) ostia		(3) The DNA double helix is exposed.
128.	Which one of the following statements is not valid for aerosols?		(4) Transcription is occurring.
	(1) They alter rainfall and monsoon patterns	135.	The region of Biosphere Reserve which is legally
L	(2) They cause increased agricultural productivity y		protected and where no human activity is allowed is known as :
	(3) They have negative impact on agricultural land		(1) Buffer zone
	(4) They are harmful to human health		(2) Transition zone
190	A haby boy agod two years is a dwitted to where 1		(3) Restoration zone
147.	and passes through a dental check - up. The dentist	E.	(4) Core zone
	were absent?	136.	Name the gas that can readily decolourise acidified
	(1) Canines		$KMnO_4$ solution :
	(2) Pre-molars	\ \	(1) SO ₂
し	(3) Molars		(2) NO ₂
	(4) Incisors		(3) $P_2O_5 \varphi$
130.	Select the mismatch :		(4) CO ₂ ,
	(1) Cycas - Dioecious - P		
	(2) Salvinia - Heterosporous / 10	(137)	Mechanism of a hypothetical reaction
QQ	98) Equisetum - Homosporous 🧹		$X_2 + Y_2 \rightarrow 2$ XY is given below :
1	(4) Pinus - Dioecious (1		(i) $X_2 \rightarrow X + X$ (fast)
131.	The morphological nature of the edible part of		(ii) $X + Y_2 \Longrightarrow XY + Y$ (slow)
	(1) Cotyledon		(iii) $X_{a} + Y_{a} \rightarrow pXY$ (fast)
	2 Endosperm		The overall order of the reaction will be
Ľ	(3) Pericarp		GT 2 FN 7 FU2]
	(4) Perisperm	r r	
132.	Double fertilization is exhibited by :		(3) 1.5
	(1) Algae		
	(2) Fungi		
C	(3) Angiosperms(4) Gymnosperms	138.	The element $Z = 114$ has been discovered recently. It will belong to which of the following family/group and electronic configuration?
(133).	Spliceosomes are not found in cells of :		(1) Carbon family IRp] $5f14 6.410 7c2 7c2$
\smile	(1) Fungi		(1) Carbon family, $[M] 0^{-1} 0^{-1} 75^{-1} p^{-1}$
	(2) Animals		(2) Oxygen tamily, $[Kn] 5t^{14} 6d^{10} 7s^2 7p^4$
¢.	(3) Bacteria		(3) Nitrogen family, [Rn] $5f^{14} 6d^{10} 7s^2 7p^6$
	(4) Plants	(R)	(4) Halogen family, [Rn] 5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁵
		\cup	
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	CH2 Hat HIT	
	ph-0- ch 31	
0001 00000	° ^(Y) 1	7
terrente de	139. The heating of phenyl-methyl ethers with HI	143. Which one is the most acidic compound ?
;	(1) iodobenzene	ŎН
1.11	(2) phenol	and the second sec
- Althouse and sec.	(3) benzene	
and a second	(4) ethyl chlorides	
are a final and a second	140. Which one is the correct order of acidity?	OH
و دينيا و المحمد ال	(1) $CH \equiv CH > CH_3 - C \equiv CH > CH_2 = CH_2 > a$ $CH_3 - CH_3 \qquad \swarrow$	
Second to see the	(2) $CH \equiv CH > CH_2 = CH_2 > CH_3 - C \equiv CH > CH_2 = CH_2 > CH_3 - C \equiv CH_3 - C = CH_3 - C = C = C = C = C = C = C = C = C = C$	
Conception of the second	(3) $CH_2 - CH_2 > CH_2 = CH_2 > CH_2 - C \equiv CH >$	NO ₂
of the second state	CH=CH >	QU
and a second	(4) $CH_2 = CH_2 > CH_3 - CH = CH_2 > CH_3 - C \equiv CH > CH = CH = CH$	O ₂ N NO ₂
		(3)
and a subscription	141. Predict the correct intermediate and product in the following reaction: $c \neq 0$	
-	HoO, HoSO4	NO ₂
-	$H_3C - C \equiv CH \xrightarrow{2} HgSO_4$ intermediate \longrightarrow product (A) (B)	ОН
Ì		
	(1) A: $H_3C - C = CH_2$ B: $H_3C - C = CH_2$ OH SO_4 γ	(4)
	(2) A: H ₃ C-C-CH ₃ B: H ₃ C-C=CH γ	CH ₃
	Ŏ	144. The correct increasing order of basic stre
	(3) A: $H_3C-C=CH_2$ B: $H_2C-C-CH_3$	the following compounds is :
	OH O.	NH2 NH2 NH2
	(4) A : $H_3C - C = CH_2$ B : $H_3C - C - CH_3$	
Address of the second s	. 'SO ₄ Ö i	
	142. The equilibrium constants of the following are :	NO_2 CH_3
	$N_2 + 3 H_2 \rightleftharpoons 2 NH_3 \qquad K_1 \qquad \downarrow \qquad \downarrow \qquad $	(I) (II) (III) -
	$N_2 + O_2 \rightleftharpoons 2 \text{ NO}$ K_2 C_1	(1) III < I < II
	$H_2 + \frac{1}{2}O_2 \rightarrow H_2O$ K_2 $\mathcal{V}^{\mathfrak{F}}$	(2) III < II < I
	The equilibrium constant (K) of the reaction	(3) II <i<iii-< th=""></i<iii-<>
the second s		$(4) \qquad II < III < I$
	$2 \text{ NH}_3 + \frac{5}{2} \text{ O}_2 \rightleftharpoons 2 \text{ NO} + 3 \text{ H}_2\text{O}$, will be:	145. Ionic mobility of which of the following alk
	(1) $K_2 K_2^3/K_1$	ions is lowest when aqueous solution of t
the second s	(2) $K_2 K_3 / K_1$	(1) K
And a state of the	(3) $K_2^3 K_2/K_1$	(2) Rb
		B) Li
	(4) $K_1 K_3^2 / K_2$	(4) Na
CALIFORNIA		

Х

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order of basic strength for



of the following alkali metal ueous solution of their salts ic field ?





(1) Micro organisms present in the soil(2) Oceans

Which of the following is a sink for CO_{2}

- (3) Plants
- (4) Haemoglobin
- 61. If molality of the dilute solution is doubled, the value of molal depression constant (K_f) will be :
 - (1) halved
 - (2) tripled
 - (3) unchanged
 - (4) doubled
- 162. Which of the following is dependent on temperature?
 - (1) Molarity
 - (2) Mole fraction
 - (3) Weight percentage
 - (4) Molality,
 - 3. Which one of the following statements is not correct?
 - (1) The value of equilibrium constant is changed in the presence of a catalyst in the reaction at equilibrium.
 - (2) Enzymes catalyse mainly bio-chemical reactions.
 - (3) Coenzymes increase the catalytic activity of enzyme.
 - (4) Catalyst does not initiate any reaction.



Test Booklet Code



No.: 6320683

This Booklet contains 24 pages.



4. 5.

6.

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

Important Instructions :

- 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.
- 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**.
- Use Blue/Black Ball Point Pen only for writing particulars on this page/marking response
- Rough work is to be done on the space provided for this purpose in the Test Booklet only.
- 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.
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- 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 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.

11.

The correct increasing order of basic strength for Y The most suitable method of separation of 1:15. the following compounds is : 1. mixture of ortho and para - nitrophenols is : NH2 NH_2 NH₂ Steam distillation (1)Sublimation (2)Chromatography (3) CH3 + H NO2 -M Crystallisation (4) (III)(II) (I) Which of the following statements is not correct? 2. $\Pi < I < \Pi$ Denaturation makes the proteins more active. $\Pi < \Pi I < I$ (2)Insulin maintains sugar level in the blood of III < I < II (2)(3) a human body. $\mathrm{III} < \mathrm{II} < \mathrm{I}$ (4)Ovalbumin is a simple food reserve in egg -Which one of the following pairs of species have the (3) PHINIA 6. 15 16 17 1 11/1 kex 14 white. same bond order? Blood proteins thrombin and fibrinogen are 0 ^{۱۹} N₂, Ó₂ (4) involved in blood clotting. how (1) CO, NO CED :NED (2) Of the following, which is the product formed when €₂, NO+ (3) CN-, CO "9 T=N 10=0 cyclohexanone undergoes aldol condensation 3. Name the gas that can readily decolourise acidified followed by heating? 7. KMnO₄ solution : P_2O_5 $(\overline{1})$ CO_2 (2)(1)SO2# (3) NO_2 (4)The reason for greater range of oxidation states in 8. actinoids is attributed to : 4f and 5d levels being close in energies 6 (1)the radioactive nature of actinoids Ч Ç (2) (2) (2)6 actinoid contraction AC(3) ĊΗ 5f, 6d and 7s levels having comparable -1 S=1.1×10°4 5f 6d energies Concentration of the Ag+ ions in a saturated 9. solution of $Ag_2C_2O_4$ is 2.2×10^{-4} mol L Solubility product of Ag2C2O4 is 5.3×10^{-12} (IX 2.42×10^{-8} (2) 2.66×10^{-12} (3) 4.5×10^{-11} (4)(4) With respect to the conformers of ethane, which of 1. ÓΉ 10. 52 the following statements is true? Both bond angles and bond length remains The heating of phenyl-methyl ethers with HI .(1) C-C 4. same produces. Bond angle remains same but bond length (2)benzene (1) changes Bond angle changes but bond length remains ethyl chlorides (2)same, iodøbenzene Both bond angle and bond length change (3) (4) phenol





28. Consider the reactions:

$$\frac{\chi \oplus 1}{(24,0)^{37} \times 1} \xrightarrow{(1+\alpha)^{37} \times 1} \oplus 1^{37} \oplus 1^{37}$$

Y Ionic mobility of which of the following alkali metal The correct statement regarding electrophile is : 40. 35. ions is lowest when aqueous solution of their salts Electrophile can be either neutral or positively are put under an electric field? charged species and can form a bond by accepting a pair of electrons from a Li nucleophile Na (2)Electrophile is a negatively charged species (2) К (3) and can form a bond by accepting a pair of (4) Rb electrons from a nucleophile Electrophile is a negatively charged species (3) The element Z = 114 has been discovered recently. 41. and can form a bond by accepting a pair of It will belong to which of the following family/group electrons from another electrophile and electronic configuration? Electrophiles are generally neutral species (4) Nitrogen family, [Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁶ 26 and can form a bond by accepting a pair of (1)Halogen family, [Rn] 5f¹⁴ 6d¹⁰ 7s² 7p çn electrons from a nucleophile (2) Carbon family, [Rn] $5f^{14} 6d^{10} 7s^2$ (BY For a given reaction, $\Delta H = 35.5 \text{ kJ mol}^{-1}$ and 36. Oxygen family, [Rn] $5f_{L}^{14}$ $6d_{\ell}^{10}$ $7s^2$ $\Delta S = 83.6 \, \text{JK}^{-1} \, \text{mol}^{-1}$. The reaction is spontaneous (4) at : (Assume that ΔH and ΔS do not vary with DG = DH-TOS Which one is the correct) order of acidity ? n temperature) 42. DHKTOS T > 298 K $CH_3 - CH_3 > CH_2 = CH_2 > CH_3 - C = CH >$ (1) (1)T-425 K (2) CH=CH T > 425 K $CH_2 = CH_2 > CH_3 - CH = CH_2 > CH_3 - C \equiv$ (3) (2)CH≯CH≡CH all temperatures. (4) $CH \equiv CH > CH_3 - C \equiv CH > CH_2 = CH_2 >$ Which of the following pairs of compounds is (3) yzò $CH_3 - CH_3$ 5500 isoelectronic and isostructural? $CH \equiv CH > CH_2 = CH_2 > CH_3 - C \equiv CH >$ IF3, XeF, 47 (4) $CH_3 - CH_3$ @ 26+3V B Cl₂, XeF₂ XeF2#+30 (3) 266 Tel If molality of the dilute solution is doubled, the value 54+18 43. of molal depression constant (Kf) will be : R IBr_, XeF 218 unchanged HgCl2 and I2 both when dissolved in water doubled 2° (2) 38. containing I - ions the pair of species formed is : A7-1105 halved 16 217 (3) 71971 (1)so tripled 26 f24P 27-8 (20+ 34 (4)Ć 20+34P. 3 The species, having bond angles of 120) is : 44. Hgl₂, I > C-O-NIA BCL HgI_4^{2-} Broß PH3 90 (2)e-U-NH2 CIF₃7 (3)Ø Which one of the following statements is not 39. NCl₃ correct? (4) Coenzymes increase the catalytic activity of (1)45. ⁽⁰³ Which of the following reactions is appropriate for enzyme. 🗸 converting acetamide to methanamine? Catalyst docs not initiate any reaction. (2)Gabriels phthalimide synthesis \mathcal{C} \checkmark (1) The value of equilibrium constant is changed (3) Earbylamine reaction & US VH in the presence of a catalyst in the reaction at (2) equilibrium. Hoffmann hypobromamide reaction Enzymes catalyse mainly bio-chemical (4) Stephens reaction (4) reactions. SNU

	<mark>an an a</mark>
	7
46. Asymptote in a logistic growth curve is obtained when :	52. With reference to factors affecting the rate of photosynthesis, which of the following statements
(1) K <n< th=""><th>IS HOP COTTECT :</th></n<>	IS HOP COTTECT :
(2) The value of 'r' approaches zero	(1) Tomato is a greenhouse crop which can be grown in CO_2 - enriched atmosphere for bipher yield
$ \begin{array}{c} \textbf{(3)} & \textbf{K} - \textbf{N} \\ \textbf{(4)} & \textbf{K} > \textbf{N} \end{array} $	Light saturation for CO_2 fixation occurs at
47 The vascular cambium normally gives rise to	10% or run sunight
(1) Periderm	(3) Increasing atmospheric CO_2 concentration up to 0.05% can enhance CO_2 fixation rate
(2) Phelloderm	(4) C_3 plants respond to higher temperatures
(3) Primary phloem	with enhanced photosynthesis while
(4) Sécondary xylem	optimum w
48. In case of poriferans, the spongocoel is lined with	
flagellated cells called :	55. The association of histone H1 with a nucleosome indicates :
(1) mesenchymal cells	(1) The DNA double helix is exposed. (1)
	(2) Transcription is occurring.
(d) obcuria	(3) DNA replication is occurring
	TE DIA
49. Fruit and leaf drop at early stages can be prevented by the application of :	Fibre:
(1) Gibberellic acid & Cy. 4A	
(2) Cytakinins	54. GnRH, a hypothalamic hormone, needed in
$(2) \forall y \text{ watting} $	reproduction, acts on.
(d) Euryrene (4) Auxins	(1) posterior pituitary <u>gland</u> and stimulates secretion of LH and relaxin.
50. A gene whose expression helps to identify	(2) anterior pituitary gland and stimulates secretion of LH and exytocin.
transformed cell is known as :	(3) anterior pituitary gland and stimulates
(1) Structural gene	secretion of LH and FSH.
14 (2) Selectable marker	(4) posterior pituitary gland and stimulates
(3) Vector	secretion of oxytocin and FSH.
(4) Plasmid	
51. The final proof for DNA as the genetic material came	55. DNA fragments are :
from the experiments of :	(1) Either positively or negatively charged depending on their size
(1) Hargobind Khorana	(2) Pasitively charged
(2) Griffith	(2) Norstingly charged
(3) Hershey and Chase	ivegauvery cliaiged
(4) Avery, Mcleod and McCarty	(4) Neutral

ч.

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	2	
Y /	8	
Which of the following options gives the correct	62.	A dioecious flowering plant prevents both :
sequence of events during mitosis ?		(1) Cleistogamy and xenogamy
(1) condensation \rightarrow arrangement at equator \rightarrow		(·)
centromere division \rightarrow segregation \rightarrow		(2) Autogamy and xenogamy
teropnase		(3) Autogamy and geitonogamy
(2) condensation \rightarrow nuclear membrane		(4) Geitonogamy and xenogamy
$\begin{array}{c} \text{ulsassembly} \rightarrow \text{crossing} \text{over} \rightarrow \\ \text{segregation} \rightarrow \text{telephase} \end{array}$		(-)Barri, marson Barri,
segregation - terophase	67	Planta which made a sharest
$disassembly \rightarrow nuclear membrane$	05.	pneumatophores and show vivinary belong
α centromere division \rightarrow segregation \rightarrow		
telophase		(1) Hydrophytes
(4) condensation \rightarrow crossing over \rightarrow nuclear		(2) Mesophytes
membrane disassembly \rightarrow segregation \rightarrow		(3) Halophytes
telophase	L L	
		(4) Psammopnytes
do not collapse even after forceful evpiration		
because of:	64.	Coco <u>nut fru</u> it is a :
(1) Expiratory Reserve Volume		(1) Capsule
(2) Residual Volume	V	(2) Drupe
(3) Inspiratory Reserve Volume		(3) Borray
· (4) Tidal Volume		
		(4) Nut
with reference to enzymes?		
Holoonzyme = Coonzyme - Co factor	65.	Which of the following is made up of dead c
$(2) \qquad \text{Anonymuch - Coencyme} + Contactor$		(1) Phloem
(2) Holoenzyme – Holoenzyme + Coenzyme	· ·	(2) Vylom novonsky
$(1) \qquad \qquad$		(2) Aylent parenchy ha
(4) Coenzyme = Apoenzyme + Holoenzyme	х.	(3) Collenchyma 🕴 🖓 🚆
Which of the following are not polymeric?	p.	(4) Phellem
(1) Kipids >> * * * PATPA		
(2) Nucleic acids DADA AT FA	66.	Root hairs develop from the region of :
(3) Proteins		(1) Movistomatic activity
(4) Polysaccharides × ベ		(1) Mensiematic activity
		(Z) Maturation
character to the bacterial cell?		(3) Elongation 🎾
All Glycocalyx	· ·	(4) Root cap 🗴
(2) Cell wall h_{id}		
$(3) \qquad \text{Nuclear membrane} \qquad (4)$	67	Which of the following options best represe
(4) Plasma membrane		enzyme composition of pancreatic juice?
		(1) lipase, amylase, trypsir
61. An example of colonial alga is :		procarboxypeptidase
(1) Spirogyra		(2) amylase, peptidase, trypsingen rep
(2) Chlorella	•	
(8) Volvox		(5) amylase, pepsin, trypsinogen, maltas
(4) Ulothrix		(4) peptidase, amylase, pepsin, rennin

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During DNA replication, Okazaki fragments are Zygotic meiosis is characteristic of 74. 68/ used to elongate : Chlamyton (1)The lagging strang away from the replication (1)fork. (3)The leading strand towards replication for (2)(4)Funar The lagging strand towards replication fork. (ð) (4) The leading strand away from replication Which of the following are found in extreme saline 69. fork. conditions ? Mycobacteria (1)Select the correct route for the passage of sperms in' 75. male frogs : Archaebacteria Testes \rightarrow Vasa efferentia \rightarrow Kidney \rightarrow (1) Eubacteria (3) Bidder's canal \rightarrow Urinogenital duct \rightarrow (4)Cyanobacteria Cloaca Testes \rightarrow Bidder's canal \rightarrow Kidney \rightarrow Vasa (2)In Bougainvillea thorns are the modifications of : 70. efferentia \rightarrow Urinogenital duct \rightarrow Cloaca Leaf (1) Testes \rightarrow Vasa efferentia \rightarrow Kidney \rightarrow (3) Stipules (2) Seminal Vesicle \rightarrow Urinogenital duct \rightarrow Adventitious root (3) Cloaca Stem Testes \rightarrow Vasa efferentia \rightarrow Bidder's canal (4) \rightarrow Ureter \rightarrow Cloaca Viroids differ from viruses in having : 71. RNA molecules without protein coat F6/ If there are 999 bases in an RNA that codes for a **1**) protein with 333) amino acids, and the base at (2)DNA molecules with protein coat position 901 is deleted such that the length of the DNA molecules without protein coat (3) RNA becomes 998 bases, how many codons will be RNA molecules with protein coat altered ? (4)333 (1) Adult human RBCs are enucleate. Which of the 72. (2) following statement(s) is/are most appropriate explanation for this feature? (a) They do not need to reproduce (b) They are somatic cells Which of the following facilitates opening of 77. stomatal aperture? They do not metabolize (c) (1) Longitudinal Ørientation of cellulose All their internal space is available for oxygen (d) microfibrils in the cell wall of guard cells transport (2) Contraction of outer wall of guard cells **Options:** Decrease in turgidity of guard cells (3)(k) and (c) (1)Radial orientation of cellulose microfibrils in Only (d) (2)the cell wall of guard cells (3) Only (a) Anaphase Promoting Complex (APC) is a protein (4) (a), (g) and (d) 78. degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell; Which of the following RNAs should be most which of the following is expected to occur? abundant in animal cell ? Recombination of chromosome arms will (1)mi-RNA > mkni (1)occur Chromosomes will not condense (2) (3) Chromosomes will be fragmented (3) (4) Chromosomes will not segregate

10 Presence of plants arranged into well defined vertical Life cycle of Ectocarpus and Fucus respectively 84. layers depending on their height can be seen best in : Haplodiplontic, Haplontic (1)**Temperate Forest** Haplontic, Diplontic (2)Tropical Savannah Diplontic, Haplodiplontic **Tropical Rain Forest** Haplodiplontic, Diplontic (4)Grassland Which statement is wrong for Krebs' cycle? Match the following sexually transmitted 85. The cycle starts with condensation of acetyl diseases (Column - I) with their causative agent group (acetyl CoA) with pyruvic acid to yield citric acid $\partial^{\text{R}} A' A$ (Column - II) and select the correct option. Â citric acid cit Column-I Column-II There are three points in the cycle where HIV Gonorrhea (i) (a) NAD⁺ is reduced to NADH+H⁺ (ii) Neisseria Syphilis (b) There is one point in the cycle where FAD+ (iii) Treponema **Genital Warts** (c) is reduced to FADH₂ AIDS (iv) Human (đ) During conversion of succinyl CoA to Papilloma - Virus succinic acid, a molecule of GTP is synthesised **Options:** (đ) (a) **(b)** (c) Transplantation of tissues/organs fails often due (1) (iv) (iii) (ii) (i) to non-acceptance by the patient's body. Which type of immune<u>-response</u> is responsible for such (ii)_ (iii) (iv) (i) (iii) (iv) (i) (ii)/ (3) Physiological immune response (4) (ii) (iii) (i) (iv) Autoimmune response Select the mismatch : 86. Cell - mediated immune response Egyisetum Homosporous (1)Hormonal immune response

Artificial selection to obtain cows yielding higher milk output represents :

Ke?

Y

79.

80.

81.

82

are:

(1)

(2)

(3)

(2)

(3)

(4)

rejections?

(1)

(2)

(4)

- (1)stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows.
- stabilizing selection as it stabilizes this (2)character in the population.
- directional as it pushes the mean of the (3) character in one direction.
- disruptive as it splits the population into two, (4) one yielding higher output and the other lower output.

Select the mismatch: 83.

(1)	Rhizobium	_	Alfalfa
(2)	Frankia	-	Alnus
18)	Rhodospirillum	APB-	Mycorrhiza
(4)	Anabaena	-	Nitrogen fixer

Pinus

Dioecious Dioecious (3) Cycas Heterosporous ·(4) Salvinia

- 87. The region of Biosphere Reserve which is legally protected and where no human activity is allowed is known as :
 - **Restoration** zone (1)
 - Core zone (2)
 - (3) Buffer zone
 - (4)Transition zone
- Identify the wrong statement in context of 88. heartwood :
 - It comprises dead elements with highly (1)lignified walls

Organic compounds are deposited in it (2)

J‡is highly durable (3)

It conducts water and minerals efficiently

		anna shini ya wananananananana wa ya wa na
		• • • • • • • • • • • • • • • • • • •
in the second	* 89. The function of copper ions in copper releasing	95. Capacitation occurs in :
and the second se	IUD's is:	(1) Female Reproductive tract
	(1) They inhibit ovulation.	(2) Rete testis
	(2) They suppress sperm motility and fertilising capacity of sperms.	(3) Epididymis
1 (A) 	(3) They inhibit gametogenesis.	(4) Vas deferens
	(4) They make uterus unsuitable for implantation.	96. Which of the following is <u>correctly</u> matched for the product produced by them?
	90. The process of separation and purification of expressed protein before marketing is called	 (1) Sacchromyces cerevisiae : Ethanol (2) Acetobacter aceti : Antibiotics
	(1) Postproduction processing	(3) Methanobacterium : Lactic acid
	(2) Upstream processing	(4) Penicillium notatum : Acetic acid
- 5 	3 Downstream processing	
	(4) Bioprocessing	97. Which of the following statements is correct ?
	91. Which among the following are the smalles living	(1) The descending limb of loop of Henle is permeable to electrolytes.
	cells, known without a definite cell wall, pathogenic	(2) The ascending limb of loop of Henle is
Ż	to plants as well as animals and can survive without	Impermeable to water.
	oxygen?	(3) The descending limb of loop of fielde is impermeable to water (1)
	(1) Nostoc	(4) The ascending limb of loop of Henle is
2	(2) Bacillus	permeable to water.
	(3) Pseudomonas	The sector material of introductor in
	(4) Mycoplasma	78. The water potential of pute water is.
2 98 38	92. Phosphoenol pyruvate (PEP) is the primary CO ₂ acceptor in :	(1) where man one p_{ν} . (2) Zero
alla S	(1) C_3 and C_4 plants	(3) Less than zero
	(2) C _e plants	(4) More than zero but less than one
	$\begin{array}{c} (3) C_4 \text{ plants} \\ (4) C_1 \text{ plants} \end{array}$	99. The genotypes of a Husband and <u>Wife are I^{AIB} and the second second</u>
y J	93. MALT constitutes about percent of the	Among the blood types of thei <u>r child</u> ren, how many different <u>gen</u> otypes and phenotypes are possible ?
	lymphoid tissue in human body.	0 (1) 4 genotypes ; 4 phenotypes
 	(I) 10% A A	06 (2) $\overline{3 \text{ genotypes}}$; 3 phenotypes
	(2) 50%	B. (3) 3genotypes; 4 phenotypes
	(3) 20% (4) 70%	4 genotypes ; 3 phenotypes
٦f	94. The DNA fragments separated on an agarose gel	100. An important characteristic that Hemichordates share with Chordates is :
.y	(1) Ethidium bromide	(1) pharynx without gill slits
	(2) Bromophenol blue	(2) absence of notochord >
	(3) Acetocarmine	(3) ventral tubular nerve cord
	(4) Aniline blue	(4) pharynx with gill slits
4		

19.2

12 Which one of the following is related to Ex-situ 106. Mendel's hybridization experiments? conservation of threatened animals and plants? 1870 - 1877 (1)Himalayan region 1856 - 1863 (2)Wildlife Safari parks 1840 - 1850 (3) **Biodiversity** hot spots 1857 - 1869 (4) Amazon rainforest 107. post-synaptic membrane 倒 membranes of synaptic vesicles (2) pre-synaptic membrane (3) tips of axons (4) Which among these is the correct combination of 108. aquatic mammals? Trygon, Whales, Seals (1)Seals, Dolphins, Shark (2)Dolphins, Seals, Trygon (3) Whales, Dolphins, Seals X=24, Y=12 True ribs are dorsally attached to vertebral column Good vision depends on adequate intake of carotene-109. but are free on ventral side. rich food. True ribs are attached Select the best option from the following statements. X = 12, Y = 7dorsally to vertebral column Vitamin A derivatives are formed from (a) and ventrally to the sternum. carotene. True ribs are attached X = 12, Y = 5The photopigments are embedded in the (b) dorsally to vertebral column membrane discs of the inner segment. and sternum on the two ends. Retinal is a derivative of Vitamin A. (c) True ribs are dorsally Retinal is a light absorbing part of all the (d) attached to vertebral column visual photopigments. but are free on ventral side. **Options:** (b), (c) and (d)/ (1)(a) and (b) 🗡 (2) (a), (c) and (d) (S) (a) and (c) (4)What is the criterion for DNA fragments movement 110. on agarose gel during gel electrophoresis? Negatively charged fragments do not move (1)Attractants, and rewards are required for : The larger the fragment size, the farther it (2)moves The smaller the fragment size, the farther it

(3)

moves

- Agemophily 🎢 (2)
- (3)
- (4)

- Which one from those given below is the period for
- Receptor sites for neurotransmitters are present on :
- Which of the following in sewage treatment removes 102. suspended solids ?
 - Sludge treatment (1)

101.

(1)

(2)

(3)

(4)

(1)

(3)

(4)

12

1

- Tertiary treatment (2)
- Secondary treatment (3)
- Primary treatment Æ
- Out of 'X' pairs of ribs in humans only 'Y' pairs are 103. true ribs. Select the option that correctly represents values of X and Y and provides their explanation :

X = 24, Y = 7

- Double fertilization is exhibited by : 104
 - Angiosperms (IY
 - Gymnosperms (2)
 - Algae (3)
 - Fungi (4)

05.

- Cleistogamy (1)
- Entomophily -
- Hydrophily

Positively charged fragments move to farther (4)end
5		$_{ m sec}$,	3 [uh]		$ \mathbf{Y} $
an/	Hype not ca	rsecretion of Growth Hormone in adults does use further increase in height, because	117.	A baby and pa	boy aged two years is admitted to play school isses through a dental check - up. The dentist
	(1)	Muscle fibres do not grow in size after pirth		observ	ed that the boy had twenty teeth. Which teeth
1	(2)	Growth Hormone becomes inactive in adults	- - 	(1)	Molars 2102
	(3)	Epiphyseal plates close after adolescence		(1)	Incisors
Ľ	(4)	Bones loose their sensitivity to Growth		(3)	Canines
		Hormone in adults,		(4)	Pre-molars
112	Whic	h of the following represents order of 'Horse' ?	110	Amon	a the following characters, which are used
	(1)	Forme	110.	not co	nsidered by Mendel in his experiments on
		Fanidaa		pea?	
	(3)	Pariesodactula		(1)	Pod - Inflated or Constricted
		Caballus	· · ·	(2)	Stem - Tall or Dwarf
7	(=)			(3)	Trichomes - Glandular or non-glandular
113.	Thala	ssemia and sickle cell anemia are caused due		(4)	Seed - Green or Yellow \mathcal{O}
	to a the	rect statement	119.	The he	patic portal vein drains blood to liver from :
· •	(1)	Sickle cell anomia is due to a quantitation		(1)	Intestine
در ^۱	Ψ.	problem of globin molecules.		(2)	Heart 9
	(2)	Both are due to a qualitative defect in globin chain synthesis. Σ		(3) (4)	Stomach Kidneys 🞾
, .	(3)	Both are due to a quantitative defect in globin chain synthesis.	120.	Which antiba	n cells of ' <u>Crypts of Lieberk</u> uhn' secrete cterial lysozyme?
	(4)	Thalassemia is due to less synthesis of globin	· . · ·	(1)	Kupffer cells p°
		molecules.		(2)	Argentaffin cells 🐔 🎝 🗸
114	Myol	in sheath is produced by	ેલ્	(3)	Paneth cells
. .		Osteoclasts and Astrocytes		(4)	Zymogen cells
	-	Schwann Cells and Oligodan drocutes	121.	Splice	osomes are not found in cells of :
V	(4)(3)	Astrocytes and Schwann Calls	Ą	JE -	Bacteria
	(c) (4)	Oligodendrocytes and Osteorlasts		(2)	Plants
	(=)	Cheforenaiocy its unit Osicochists		(3)	Fungi
115.	Hom	ozygous pur <u>elines</u> in cattle can be obtained		(4)	Animals
	by:		122.	Frog's	heart when taken out of the body continues
	(1)	mating of individuals of different species.		to beat	for sometime.
<u> </u>	2	mating of related individuals of same breed.		Select	the best option from the following statements.
	(3)	mating of unrelated individuals of same		(a)	Frog is a poikilotherm.
	(4)	mating of individuals of different bread		(b)	Frog does not have any coronary circulation.
	· · · ·			(C) (d)	Heart is autoevoitable
116.	Myg	perhizae are the example of :		Ontio	11ca113 autocaligane.
r. r	(A)	Mutualism			(c) and (d)
	(2)	Fungistasis		(2)	Only (c)
	(3)	Amensalism		(3)	Only (d)
- 	(4)	Antibiosis		(4)	(a) and (b)

Y 14	the maximum biomass?
123. Functional megaspore in an angiosperm develops	130. Which ecosystem has the maximum product of
into:	(1) Lake ecosystem
(1) Embryo	(2) Forest ecosystem
(2) Ovule	(3) Grassland ecosystem
(3) Endosperm	(1) Pondecosystem
(4) Embryo sac	(4) I Olid Ecosystem
the state of the s	121 A disease caused by an autosomal primary
124. Alexander Von Humbolt described for the first	non-disjunction is :
time:	(1) Sickle Cell Anemia
(1) Population Growin equation	(1) Active Contractions Mar
(2) Ecological Biodiversity	(2) Down's Syndrome
(3) Laws of limiting factor	(3) Klinefelter's Syndrome
(4) Species area relationships	(4) Turner's Syndrome
The morphological nature of the edible part of	
coconutis:	132. Which of the following cell organelles is responsible
(1) Pericarp	for extracting energy from carbonydrates to toring
(2) Perisperm	
(2) Cotyledon	(1) Mitochondrion
(d) Endosnerm	(2) Lysosome
tat Endosperning	(3) Ribosome
126. A temporary endocrine gland in the human body	(A) Chloroplast
is:	(4) Chlorophase
(1) Corpus allatum	122 DNA replication in bacteria occurs:
(2) Pineal gland r thy	155. Divisiepiduation
(3) Corpus cardiacum	(1) Just before transcription
(4) Corpus luteum	(2) During S phase $\sqrt{3}$ $\sqrt{3}$
in the overy and	(3) Within nucleolus
127. Flowers which have single ovtile in the ovary and	(4) Prior to fission
are packed life initial scene and a summer packet	· ·
(1) Bat	134. In case of a couple where the male is having a very
$(1) \qquad \text{Water}$	low sperm count, which technique will be suitable
$(2) \qquad \forall a = 1$	for fertilisation ?
(3) Det	(1) Intracytoplasmic sperm injection
	(2) Intrauterine transfer
128. The pivot joint between atlas and axis is a type of :	(3) Gamete intracytoplasmic fallopian transfer
(1) saddle joint	(4) Artificial Insemination
(2) fibrousioint	All Internation
(3) cartilaginous joint	105 Which one of the following statements is not valid
(0) example in the symposization of the sympo	for aerosols?
Syllovin jonn	(1) They have negative impact on agricultural
129. A decrease in blood pressure/volume will not dause	land
the release of :	(2) They are harmful to human health
(1) ADH	(4) They alter minfall and monsoon natterns
(2) Renin	(3) they after railian and moreour parterne
(3) Atrial Natriuretic Factor +	They cause increased agricultural
(4) Aldosterone	productivity

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VC 16 Y 147. Which one of the following represents forward In a common emitter transistor amplifier the audio 143. signal voltage across the collector is 3 V. The bias diode? resistance of collector is $3 k\Omega$. If current gain is 100 and the base resistance is 2 k Ω , the voltage and 5 V 3 V (1) power gain of the amplifier is: Rc RB , B 20 and 2000 (1)200 and 1000 -3 V (3) 15 and 200 (3)+2 V 150 and 15000 (4) (4)Two cars moving in opposite directions approach A long solenoid of diameter 0.1 m has 2×10^4 turns 144. 148. per meter. At the centre of the solenoid, a coil of each other with speed of 22 m/s and 16.5 m/s 100 turns and radius 0.01 m is placed with its axis respectively. The driver of the first car blows a horn having a frequency 400 Hz. The frequency heard coinciding with the solenoid axis. The current in by the driver of the second car is [velocity of sound the solenoid reduces at a constant rate to 0A from 4 A in 0.05 s. If the resistance of the coil is $10 \pi^2 \Omega$, 340 m/s]: N= n(VEVo the total charge flowing through the coil during this C= dØ = 021 448 Hz (1)time is : . 16 π μC (1) 350 Hz (2)(2)32 π μΟ 361 Hz (3)(3) 411 Hz 32 µ C Two astronauts are floating in gravitational free 145. A rope is wound around a hollow cylinder of mass space after having lost contact with their spaceship. 149. 3 kg and radius 40 cm. What is the angular The two will: acceleration of the cylinder if the rope is pulled with a force of 30 N? will become stationary. (1) 5 m/s^2 (1) keep floating at the same distance between (2) them. 25 m/s^2 hom (2) $0.25 \text{ rad}/s^2$ move towards each other. (3) (3)move away from each other. 25 rad/s A capacitor is charged by a battery. The battery is 150. A gas mixture consists of 2 moles of O2 and 4 moles removed and another identical uncharged capacitor 146. of Ar at temperature T. Neglecting all vibrational is connected in parallel. The total electrostatic energy modes, the total internal energy of the system is : C of resulting system : (1) 11 RT increases by a factor of 2 increases by a factor of 4 (2)4 RT decreases by a factor of (3) 15 RT mains the same (4) 9 RT

gn-9(1-24) gh - ghit 19 = X-11 The acceleration due to gravity at a height 1 km 155. 151. Suppose the charge of a proton and an electron differ above the earth is the same as at a depth d below the slightly. One of them is -e, the other is $(e + \Delta e)$. If surface of earth. Then : the net of electrostatic force and gravitational force between two hydrogen atoms placed at a distance d d=2 km(much greater than atomic size) apart is zero, then $d = \frac{1}{2} \text{ km}$ d = 1 km d = 1 km Δe is of the order of [Given mass of hydrogen (2). $m_{\rm h} = 1.67 \times 10^{-27} \, \rm kg$] 10⁻⁴⁷ C (1)(3) 10⁻²⁰ C (2) $d = \frac{3}{2}km$ (4) 10⁻²³ C (3) (4) 10⁻³⁷ C A particle executes linear simple harmonic motion 152. with an amplitude of 3 cm. When the particle is at 156. An arrangement of three parallel straight wires 2 cm from the mean position, the magnitude of its placed perpendicular to plane of paper carrying velocity is equal to that of its acceleration. Then its same current 'I' along the same direction is shown time period in seconds is : in Fig. Magnitude of force per unit length on the middle wire 'B' is given by : a - wolk A2- K2 W = WAXWA 2π (1) $\sqrt{3}$ B (2) -Y Α 🖲 (3) 4π $\sqrt{5}$ (2) A carnot engine having an efficiency of $\frac{1}{10}$ 153. as heat engine, is used as a refrigerator. If the work done on ħ the system is 10 J, the amount of energy absorbed (3) from the reservoir at lower temperature is : 100 J (4) (2) M = Ø (3) 90 T The resistance of a wire is 'R' ohm. If it is melted 157. 99 T (4) and stretched to 'n' times its original length, its new Ral Rall A Rall R-Al Rall A=n R-1 m22 resistance will be : The photoelectric threshold wavelength of silver is 154. 3250×10^{-10} m. The velocity of the electron ejected is (1) from a silver surface by ultraviolet light of :or wavelength 2536×10^{-10} m is : 2410 gy $(\text{Given } h = 4.14 \times 10^{-15} \text{ eVs and } c = 3 \times 10^8 \text{ ms}^{-1})$ nR R=n2R (2) 2 $\approx 0.3 \times 10^6 \text{ ms}^{-1}$ (2) $\approx 6 \times 10^5 \,\mathrm{ms}^{-1}$ $\approx 0.6 \times 10^6 \text{ ms}^{-1}$ (3) $\approx 61 \times 10^3 \text{ ms}^{-1}$ n²R (4)

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20Υ A spherical black body with a radius of 12 cm Preeti reached the metro station and found that the 173. radiates 450 watt power at 500 K. If the radius were 170. escalator was not working. She walked up the halved and the temperature doubled, the power stationary escalator in time t_1 . On other days, if she radiated in watt would be : remains stationary on the moving escalator, then 1800 BP - - - T the escalator takes her up in time t_2 . The time taken by her to walk up on the moving escalator will be : 225 (2)(1) t₁∙ 450 (3) (2)1000 (4) XQU (3) In an electromagnetic wave in free space the root 174. mean square value of the electric field is $E_{rms} = 6V/m$. The peak value of the magnetic field is : 6= 52108 Bo= 2×12×10 114 Two discs of same moment of inertia rotating about 4.23×10^{-8} T (1)171. their regular axis passing through centre and perpendicular to the plane of disc with angular 1.41×10 (2)velocities ω_1 and ω_2 . They are brought into contact face to face coinciding the axis of rotation. The 2.83×10^{-8} T (3) expression for loss of energy during this process is : $\frac{I}{8} (\omega_1 - \omega_2)^2 \cdot \Omega^{(\omega_1 - \omega_2)^2} \cdot \Omega^{(\omega_1 - \omega_2)^2} + \Omega^{(\omega_1 - \omega_2)^2} \cdot \Omega^{(\omega_1 - \omega_2)^2} + \Omega^{(\omega_1 - \omega_2)^2} \cdot \Omega^{(\omega_1 - \omega_2)^2} \cdot$ 0.70×10^{-8} T (4) (1)A U tube with both ends open to the atmosphere, i 175. partially filled with water. Oil, which is immiscibl (2) with water, is poured into one side until it stands a a distance of $\hat{10}$ mm above the water level on th other side. Meanwhile the water rises by 65 mi (3) from its original level (see diagram). The density (the oil is : $I(\omega_1 - \omega_2)^2$ Pa Pa Which of the following statements are correct? 172. Centre of mass of a body always coincides A `10 mm (a) with the centre of gravity of the body. ' ™Final water level Centre of mass of a body is the point at which 65 mm ----X (b) Initial water level the total gravitational torque on the body is Oil 65 mm zero. A couple on a body produce both В (C) translational and rotational motion in a body. Water Mechanical advantage greater than one (d) means that small effort can be used to lift a 928 kg m^{-3} (1) farge load MA -(c) and (d) 650 kg m^{-3} (2)മ (b) and (d) (2) 425 kg m^{-3} (3)(a) and (b) (3) 800 kg m^{-3} (4)(b) and (c) \bigvee (4)

21 179. The diagrams below show regions of equipotentials. 176. Young's double slit experiment is first performed in air and then in a medium other than air. It is found 20. V that 8th bright fringe in the medium lies where 5th dark fringe ties in air. The refractive index of the medium is nearly : (1) 1.78 BM= N. 10 V 30 V 10 V 30 V20V40 V (đ) (b) (c) (a) 1.25 (2)A positive charge is moved from A to B in each diagram. W=ZDV. Maximum work is required to move q in 1.59 (1) W= 2 3U figure (b). Maximum work is required to move q in 1.69 (4) (2) ıt figure (c). S d In all the four cases the work done is the same. (21 Minimum work is required to move q in (4) The de-Broglie wavelength of a/neutron/in thermal 177. figure (a). 5/5 equilibrium with heavy water at a temperature T pan o.O. (Kelvin) and mass m, is : A spring of force constant k is cut into lengths of 180. N= JZMK ratio 1:2:3. They are connected in series and the Э 2h new force constant is k'. Then they are connected in (1)√mkT parallel and force constant is k''. Then k' : k'' is : (1) 1:14 LXIK h (2) 1:6 (2) √mkT , is (3) ble at 1:11 h he ım /3mkT $\frac{1}{4} \frac{2}{1} \frac{2}{2} \frac{1}{2} \frac{1}$ r of 2h (4) √3mkT Ø, The x and y coordinates of the particle at any time 178. are $x = 5t - 2t^2$ and y = 10t respectively, where x and K= Krt K2 + + 1 + + 1 6 + 3 y are in meters and t in seconds. The acceleration of the particle at t = 2s is : $-8 \text{ m/s}^{2} \quad \text{ar} \qquad \qquad \text{V}_{3} = 10$ $V_{7} = 10$ $V_{7} = 10$ $A_{4} = 0$ $V_{7} = 5 - 4t$ $A_{4} = 0$ $A_{5} = -4$ $A_{7} = 0$ (1) κ^{ll} (2) (3) $-4 \, {\rm m/s^2}$

Test Booklet Code

VANI

No.: 6467137

This Booklet contains 24 pages.



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

Important Instructions :

- 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.
- 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.
- Use Blue/Black Ball Point Pen only for writing particulars on this page/marking responses.
- Rough work is to be done on the space provided for this purpose in the Test Booklet only.
- 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 W. Make sure that the CODE printed on Side-2 of the Answer Sheet is the same as that on this 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.
- 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.
- 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 Answer Sheet and dealt with as an unfair means case.
- 12. Use of Electronic/Manual Calculator is prohibited.
- 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.
- The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

 Which one form those given below is the period for with reference tonenzymes? Which one from those given below is the period for Mendel's hybridization experiments? Holoenzyme = Apoenzyme + Coenzyme Holoenzyme = Apoenzyme + Coenzyme Holoenzyme = Apoenzyme + Coenzyme Holoenzyme = Coenzyme + Co-factor Which cells of 'Crypts of Lieberkuhn' secreta anthacterial lysozyme? Argentaffin cells Zymogen cells Kupffer cells Phosphoenol pyruvate (PEP) is the primary CO2 acceptor in: (i) C₂ plants (j) The value of 'r approaches zero (j) K × N (j) The value of 'r approaches zero (j) K × N (j) The value of 'r approaches zero (j) K × N (j) The value of 'r approaches zero (j) K × N (j) The value of 'r approaches zero (j) K × N 	W		2					
(1)Apoenzyme = Holoenzyme + Coenzyme(2)Holoenzyme = Apoenzyme + Coenzyme(3)Conzyme = Apoenzyme + Holoenzyme(4)Holoenzyme = Coenzyme + Cofactor2.Which cells of 'Crypts of Lieberkuhn' secrete antibacterial lysozyme?(1)Argentaffin cells(2)Paneth cells(3)Zymogen cells(4)C. q plants(5)C. q plants(6)C. q plants(7)C. q plants(8)C. q plants(9)C. q plants(9)C. q plants(9)Column - I(10)C. q plants(11)The value of 'r approaches zero(22)Bat(3)C. q plants(4)ALDS(5)Genital Ware(6)(6)(7)(7)(8)(9)(9)(9)(10)(10)(11)Treponema(12)(11)(13)(12)(14)(13)(15)(14)(15)(15)(16)(16)(17)(17)(18)(18)(19)(19)(20)(11)(21)(12)(22)(12)(23)(24)(34)(24)(4)(25)(5)(21)(6)(21)(7)(21)(7)(21)(8)(22)(9)(21)(9)(21) <t< td=""><td>1.</td><td>Which one of the following statements is correct with reference to enzymes?</td><td>t, 6.</td><td>Wh Mei</td><td>ich one from tho ndel's hybridiza</td><td>se given below is the period for tion experiments ?</td></t<>	1.	Which one of the following statements is correct with reference to enzymes?	t, 6.	Wh Mei	ich one from tho ndel's hybridiza	se given below is the period for tion experiments ?		
(2)Holeenzyme = Apoenzyme + Coenzyme \mathcal{G} (3)Coenzyme = Apoenzyme + Coenzyme \mathcal{G} (4)Holeenzyme = Coenzyme + Co-factor2.Which cells of Crypts of Lieberkuhn' secrete antibacterial lysozyme?(1)Argentatfin cells(2)Paneth cells(3)Czypmogen cells(4)Cymogen cells(5)Czyplants(6)Czyplants(7)Caplants(7)Caplants(8)Czyplants(9)Czyplants(1)Column - I (Column - II) and select the correct option.(1)Column - I (Column - II) and select the correct option.(2)Syphilis(3)Czyplants(4)AIDS(5)Syphilis(6)Certail Watt(7)(7) (10)(8)(9) 		(1) Apoenzyme = Holoenzyme + Coenzyme	1	ar	1856 - 1863			
\mathcal{O}' Coenzyme = Apoenzyme + Holeenzyme (\mathfrak{A} Holeenzyme = Coenzyme + Co-factor2.Which cells of 'Crypts of Lieborkuhn' secrete antibacteriallysozyme 7(\mathfrak{A} 3.Phosphoenol pyruvate (PEP) is the primary CO2 acceptor in:(\mathfrak{A} (\mathfrak{A} C3 plants(\mathfrak{O}' (\mathfrak{O}' C4 plants(\mathfrak{O}' (\mathfrak{O}' C5 philos(\mathfrak{O}' (\mathfrak{O}' C6 plants(\mathfrak{O}' (\mathfrak{O}' C6 plants(\mathfrak{O}		(2) Holoenzyme = Apoenzyme + Coenzyme		(2)	1840 - 1850			
 (4) Holeenzyhe = Coenzyme + Co-factor (4) 1870-1877 (5) 1637-1809 (6) 1870-1877 (6) 1870-1877 (7) Argentaffin cells (8) Argentaffin cells (9) C₃ panth (9) C₃ plants (9) C₃ plants (1) C₃ plants (2) Z₄ plants (3) C₄ plants (4) C₃ and C₄ plants (5) C₄ plants (6) C₃ and C₄ plants (7) C₄ plants (8) Asymptote in a logistic growth curve is obtained when: (1) The value of 'r approaches zero (2) K = N (3) K > N (4) K < N (4) K < N (5) Control 1 Column-II (6) Column-I 1 Column-II (7) Canorthea (8) Asymptote in a logistic growth curve is obtained when: (1) The value of 'r approaches zero (2) K = N (3) K > N (4) K < N (4) K < N (5) Control 1 Column-II Column-		Coenzyme = Apoenzyme + Holoenzyme		(-)	1957 1960			
 Which cells of 'Crypts of Lieberkuhn' secrete attibacterial lysozyme? (1) Argentaffin cells (2) Paneth cells (3) Zymogen cells (4) C₃ plants (5) C₂ plants (6) C₃ and C₄ plants (7) C₄ plants (8) Asymptote in a logistic growth curve is obtained when: (1) The value of 'r approaches zero (2) K = N (3) K>N (4) Kaster (5) C₂ plants (6) C₃ and C₄ plants (7) C₂ plants (8) Asymptote in a logistic growth curve is obtained when: (1) The value of 'r approaches zero (2) K = N (3) K>N (4) K < N (4) K < N (5) Curum - 1 (6) Genital Warts (7) Nilsorn (8) (6) (6) (6) (9) (6) (6) (7) (10) (6) (6) (7) (11) (7) (7) (7) (12) (6) (7) (7) (13) (7) (7) (7) (14) Karmong the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygent? (1) Bacillus (2) Pseudomonas (3) K>N (4) K (5) Synbilis (6) (7) (7) (7) (7) (7) (7) (7) (7) (7) Mich among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygent? (1) Bacillus (2) Pseudomonas (3) KN (4) Neste 		(4) Holoenzyme = Coenzyme + Co-factor		(3)	1870 - 1877			
(1)Argentaffin cells(2)Paneth cells(3)Zymogen cells(4)Kupffer cells(3)Phosphoenol pyruvate (PEP) is the primary CO2 acceptor in :(1) C_3 plants(2)Re(3) C_2 plants(4) C_3 and C_1 plants(4) C_3 and C_1 plants(4) C_3 and C_1 plants(5) C_2 plants(6) C_2 plants(7) $Column - I$ (8)Asymptote in a logistic growth curve is obtained when:(1)The value of 'r approaches zero(2) $K = N$ (3) $K > N$ (4)K < N	2.	Which cells of 'Crypts of Lieberkuhn' secret antibacterial lysozyme?	e (7)	Flov	wers which have	e single ovule in the ovary and		
 (2) Paneth cells (3) Zymogen cells (4) Kupffer cells (5) C₂ plants (6) C₃ plants (7) C₃ plants (8) Asymptote in a logistic growth curve is obtained when: (9) C₂ plants (9) C₃ and C₄ plants (1) The value of 'r approaches zero (2) K = N (3) K > N (4) K < N (4) Cloumn - IJ with their causative agent (Column - IJ) with their causative agent (Column - II) with (Column - Virus (Column - II) with (Column - II)		(1) Argentaffin cells	X	are	packed into inflo	prescence are usually pollinated		
 (3) Zymogen cells (4) Kupffer cells (5) C₂ plants (6) C₃ plants (7) C₄ plants (8) Asymptote in a logistic growth curve is obtained when: (1) Water (2) Bee (3) Wind (4) Bat (4) Bat (5) C₂ plants (4) C₃ and C₄ plants (5) C₂ plants (6) C₃ plants (7) The value of 'r approaches zero (2) K = N (3) K > N (4) K < N (4) K < N (5) Syphilis (6) Gororrhea (7) Human Papilloma - Virus (8) Out of X' pairs of ribs in humans only Y' pairs are true ribs. Select the option that correctly represents values of X and Y and provides their explanation: (6) Cenital Warts (7) Human Papilloma - Virus (9) Out of X' pairs of ribs in humans only Y' pairs are true ribs. are attached dorsally to vertebral column and vertally to the stermum. (1) (a) (a) (a) (b) (c) (a) (b) (c) (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		(2) Paneth cells		by :				
 (i) Kupffer cells 3. Phosphoenol pyruvate (PEP) is the primary CO2 acceptor in: (i) C3 plants (j) C4 plants (j) C4 plants 4. Match the following sexually transmitted diseases (Column - I) with their causative agent (ii) <i>Treponema</i> (iii) <i>Treponema</i> (iv) <i>HIV Human</i> Papilloma - Virus Options: (a) (b) (c) (d) (b) (c) (d) (c) (w) (ii) (ii) (d) AIDS - (b) (iii) (e) (w) (iii) (iii) (f) (w) (iii) (iii) (g) (w) (ii) (iii) (g) (w) (ii) (iii) (g) Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without exygent? (f) Bacillus (g) Pseudomonas (g) MALT constitutes about percent of the tymphoid tissue in human body. (g) MALT constitutes about percent of the tymphoid tissue in human body. (g) MALT constitutes about percent of the tymphoid tissue in human body. (g) To% (g) To% 		(3) Zymogen cells		(1)	Water			
 3. Phosphoenol pyruvate (PEP) is the primary CO2 acceptor in: C₃ plants C₄ plants C₅ plants C₅ plants C₄ plants 4. Match the following sexually transmitted diseases (Column - I) with their causative agent (Column - II) wi		(4) Kupffer cells		(2)	Bee			
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(2) Pseudomonas (2) 20% (3) Mycoplasma (3) 70% (4) Nostoc (4) 10%		(1) Bacillus	1 **	(1)	50%	thermost in the summary		
(3) Mycoplasma (4) Nostoc (4) 10%		(2) Pseudomonas	-	(2)	20%	24. 2 ··································		
(4) Nostoc (4) 10%		(3) Mycoplasma		(3)	70%			
	-	(4) Nostoc	-1-	(4)	10%			

- 11. Homozygous purelines in cattle can be obtained by:
 - mating of related individuals of same breed.
 - (2) mating of unrelated individuals of same breed.
 - (3) mating of individuals of different breed.
 - (4) mating of individuals of different species.
- 12. Among the following characters, which one was not considered by Mendel in his experiments on pea?
 - (1) Stem Tall or Dwarf
 - (2) Trichomes Glandular or non-glandular
 - (3) Seed Green or Yellow
 - (4) Pod Inflated or Constricted
 - Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP ?
 - (1) Lysosome
 - (2) Ribosome
 - (3) Chloroplast
 - (4) Mitochondrion
- 14. If there are 999 bases in an RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?
 - (1) 1
 - (2) 11
 - (3) 33
 - (4) 333
- 15. Which of the following are found in extreme saline conditions ?
 - (1) Archaebacteria
 - (2) Eubacteria
 - (3) Cyanobacteria
 - (4) Mycobacteria

Receptor sites for neurotransmitters are present on :

- (1) membranes of synaptic vesicles
- (2) pre-synaptic membrane
- (3) tips of axons
- (4) post-synaptic membrane

- 17. Artificial selection to obtain cows yielding higher milk output represents :
 - (1) stabilizing selection as it stabilizes this character in the population.
 - (2) directional as it pushes the mean of the character in one direction.
 - (3) disruptive as it splits the population into two, one yielding higher output and the other lower output.
 - (4) stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows.

The hepatic portal vein drains blood to liver from :

- (2) Heart (2) Stomach (2) Kidneys
- (4) Intestine
- 19. The water potential of pure water is :
 - Zero
 - (2) Less than zero
 - (3) More than zero but less than one
 - (4) More than one

Which of the following represents order of 'Horse'?

- (1) Equidae
- (2) Perissodactyla
- (3) Caballus

20

- Ferus
- 21. Alexander Von Humbolt described for the first time:
 - (1) Ecological Biodiversity
 - (2) Laws of limiting factor
 - Species area relationships
 - (4) Population Growth equation
- 22. DNA fragments are :
 - (1) Positively charged
 - (2) Negatively charged
 - (3) Neutral
 - (4) Either positively or negatively charged depending on their size

622 20 A.A = 1 Coden

W

- W
- 23. A baby boy aged two years is admitted to play school and passes through a dental check up. The dentist observed that the boy had twenty teeth. Which teeth were absent ?
 - (1) Incisors
 - (2) Canines
 - Pre-molars
 - (4) Molars

Anaphase Promoting Complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur?

- (1) Chromosomes will not condense
- (2) Chromosomes will be fragmented
- (3) Chromosomes will not segregate
- (4) Recombination of chromosome arms will occur
- 25. An important characteristic that Hemichordates share with Chordates is :
 - (1) absence of notochord
 - (2) ventral tubular nerve cord
 - (3) pharynx with gill slits
 - (4) pharynx without gill slits

26.) The genotypes of a Husband and Wife are I^{AIB} and $I^{A}i$.

Among the blood types of their children, how many different genotypes and phenotypes are possible?

- (1) 3 genotypes ; 3 phenotypes
- 3 genotypes; 4 phenotypes
- (3) 4 genotypes ; 3 phenotypes
- (4) 4 genotypes ; 4 phenotypes

Transplantation of tissues/organs fails often due to non-acceptance by the patient's body. Which type of immune-response is responsible for such rejections?

- (1) Autoimmune response
- (2) Cell mediated immune response
- (3) Hormonal immune response
- Physiological immune response

- 28. Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?
 - (a) They do not need to reproduce
 - (b) They are somatic cells
 - (c) They do not metabolize
 - (d) All their internal space is available for oxygen transport

Options:

- (4) (b) and (c)
- 29. Lungs are made up of air-filled sacs, the alveoli. They do not collapse even after forceful expiration, because of :
 - (1) Residual Volume
 - (2) Inspiratory Reserve Volume
 - J Tidal Volume
 - (4) Expiratory Reserve Volume

Zygotic meiosis is characteristic of :

- (1) Marchantia
- (2) Fucus

30.

- (3) Funaria
- (4) Chlamydomonas
- 31. Select the correct route for the passage of sperms in male frogs :
 - (1) Testes \rightarrow Bidder's canal \rightarrow Kidney \rightarrow Vasa efferentia \rightarrow Urinogenital duct \rightarrow Cloaca
 - (2) Testes → Vasa efferentia → Kidney → Seminal Vesicle → Urinogenital duct → Cloaca
 - (3) Testes \rightarrow Vasa efferentia \rightarrow Bidder's canal \rightarrow Ureter \rightarrow Cloaca
 - ✓ Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca

38.

- (1) They are harmful to human health
- (2) They alter rainfall and monsoon patterns
- They cause increased agricultural productivity
- (4) They have negative impact on agricultural land
- 33. Viroids differ from viruses in having :
 - (1) DNA molecules with protein coat
 - (2) DNA molecules without protein coat
 - (3) RNA molecules with protein coat
 - (4) RNA molecules without protein coat
- (34)

During DNA replication, Okazaki fragments are used to elongate :

- (1) The leading strand towards replication fork.
- (2) The lagging strand towards replication fork.
- (3) The leading strand away from replication fork.
- (4) The lagging strand away from the replication fork.

Plants which produce characteristic pneumatophores and show vivipary belong to :

Mesophytes

(2)

- Halophytes
- (3) Psammophytes
- (4) Hydrophytes
- 36. The process of separation and purification of expressed protein before marketing is called :
 - (1) Upstream processing

2 Downstream processing

- (3) Bioprocessing
- (4) Postproduction processing
- 37. Identify the wrong statement in context of heartwood:
 - (1) Organic compounds are deposited in it
 - (2) It is highly durable
 - (3) It conducts water and minerals efficiently
 - (4) It comprises dead elements with highly lignified walls

Spliceosomes are not found in cells of :

- (1) Plants
- (2) Fungi
- (3) Animals
- (4) Bacteria
- 39. Which of the following statements is correct?
 - (1) The ascending limb of loop of Henle is impermeable to water.
 - (2) The descending limb of loop of Henle is impermeable to water.
 - (3) The ascending limb of loop of Henle is permeable to water.
 - (4) The descending limb of loop of Henle is permeable to electrolytes.
- 40. Which ecosystem has the maximum biomass ?
 - (1) Forest ecosystem
 - (2) Grassland ecosystem
 - (3) Pond ecosystem
 - (# Lake ecosystem
- 41. The final proof for DNA as the genetic material came from the experiments of :
 - (1) Griffith
 - (2) Hershey and Chase
 - (3) Avery, Mcleod and McCarty
 - (4) Hargobind Khorana
- 42. The function of copper ions in copper releasing IUD's is :
 - (1) They suppress sperm motility and fertilising capacity of sperms.
 - (2) They inhibit gametogenesis.
 - (3) They make uterus unsuitable for implantation.
 - (4) They inhibit ovulation.

An example of colonial alga is :

Chlorella
 Volvox
 Ulothrix

43

(4) Spirogyra

W	6 _
44. Root hairs develop from the region of :	50. The association of histone H1 with a nucleosome
(1) Maturation	indicates :
(2) Elongation	(1) Transcription is occurring.
(3) Root cap	(2) DNA replication is occurring.
(4) Meristematic activity	(3) The DNA is condensed into a Chromatin Fibre.
45. Hypersecretion of Growth Hormone in adults does not cause further increase in height, because :	(4) The DNA double helix is exposed.
(1) Growth Hormone becomes inactive in adults	51. A temporary endocrine gland in the human body
Epiphyseal plates close after adolescence	(1) Pineal gland
(3) Bones loose their sensitivity to Growth	(2) Corpus cardiacum
Hormone in adults.	(3) Corpus luteum
(4) Muscle fibres do not grow in size after birth.	(4) Corpus allatum
46. Which of the following in sewage treatment removes	52. Select the mismatch :
suspended solids ?	(1) Frankia – Alnus
(1) Tertiary treatment	(2) Rhodospirillum - Mycorrhiza
(2) Secondary treatment	(3) Anabaena - Nitrogen fixer
(2) Primary treatment	(4) Rhizobium - Alfalfa
(4) Sludge treatment	
	53. GnRH, a hypothalamic hormone, needed in reproduction acts on
47. Select the mismatch :	(1) anterior pituitary gland and stimulates
Pinus - Dioecious	secretion of LH and oxytocin.
(2) <i>Cycas</i> – Dioecious	(2) anterior pituitary gland and stimulates
(3) Salvinia - Heterosporous	secretion of LH and FSH.
(4) Equisetum - Homosporous	(3) posterior pituitary gland and stimulates secretion of oxytocin and FSH.
48. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis ?	(4) posterior pituitary gland and stimulates secretion of LH and relaxin.
(1) The larger the fragment size, the farther it moves	54. A gene whose expression helps to identify transformed cell is known as:
(2) The smaller the fragment size, the farther it	(1) Selectable marker
* moves	(2) Vector
(3) Positively charged fragments move to farther end	(3) Plasmid
(4) Negatively charged fragments do not move	(4) Structural gene
49 In Roussianill II	55. Presence of plants arranged into well defined vertical
(1) C:: 1	layers depending on their height can be seen best
(1) Stipules	(1) Tropical Course at
(2) Adventitious root	(1) Tropical Bain East
Gar Stem	(3) Grassland
(4) Leaf	
	remperate Forest

ż

 Functional megaspore in an angiosperm develops into:

- (1) Ovule
- (2) Endosperm
- (3) Embryo sac
- (4) Embryo
- 57. DNA replication in bacteria occurs :
 - (1) During S phase
 - (2) Within nucleolus
 - (3) Prior to fission
 - Just before transcription
- 58. Which among these is the **correct** combination of aquatic mammals?
 - (1) Seals, Dolphins, Sharks
 - (2) Dolphins, Seals, Trygon
 - 3 Whales, Dolphins, Seals
 - (4) Trygon, Whales, Seals
- 59. Coconut fruit is a :
 - Drupe
 - (2) Berry
 - (3) Nut
 - (4) Capsule
- 60. Double fertilization is exhibited by :
 - Gymnosperms
 - (2) Algae
 - (3) Fungi
 - (4) Angiosperms
- 61. Which of the following components provides sticky character to the bacterial cell?
 - (1) Cell wall
 - Nuclear membrane
 - Plasma membrane
 - (4) Glycocalyx

- Life cycle of *Ectocarpus* and *Fucus* respectively are:
- (1) Haplontic, Diplontic

7

62.

- (2) Diplontic, Haplodiplontic
- (3) Haplodiplontic, Diplontic
- (4) Haplodiplontic, Haplontic
- 63. Which one of the following is related to Ex-situ conservation of threatened animals and plants?
 - Wildlife Safari parks
 - (2) Biodiversity hot spots
 - (3) Amazon rainforest
 - (4) Himalayan region
- 64. Good vision depends on adequate intake of carotenerich food.

Select the best option from the following statements.

- (a) Vitamin A derivatives are formed from carotene.
- (b) The photopigments are embedded in the membrane discs of the inner segment.



(d)

- Retinal is a derivative of Vitamin A.
- Retinal is a light absorbing part of all the visual photopigments.

Options:

- (1) (a) and (b)
- (2) (a), (c) and (d)
- 🎢 (a) and (c)
- (4) (b), (c) and (d)
- 65. Thalassemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the correct statement.
 - (1) Both are due to a qualitative defect in globin chain synthesis.
 - (2) Both are due to a quantitative defect in globin chain synthesis.
 - Thalassemia is due to less synthesis of globin molecules.
 - (4) Sickle cell anemia is due to a quantitative problem of globin molecules.

Which of the following are not polymeric?

- (1) Nucleic acids
- (2) Proteins
- (3) Polysaccharides
- (4) Lipids
- 67. A disease caused by an autosomal primary non-disjunction is :
 - Down's Syndrome
 - Klinefelter's Syndrome
 - (3) Turner's Syndrome
 - Sickle Cell Anemia
- 68. With reference to factors affecting the rate of photosynthesis, which of the following statements is not correct?
 - Light saturation for CO₂ fixation occurs at 10% of full sunlight
 - (2) Increasing atmospheric CO₂ concentration up to 0.05% can enhance CO₂ fixation rate
 - (3) C₃ plants respond to higher temperatures with enhanced photosynthesis while C₄ plants have much lower temperature optimum
 - Tomato is a greenhouse crop which can be grown in CO₂ - enriched atmosphere for higher yield
- 69. Fruit and leaf drop at early stages can be prevented by the application of :
 - (1) Cytokinins
 - (2) Ethylene
 - (2) Auxins
 - (4) Gibberellic acid
- 70. The region of Biosphere Reserve which is legally protected and where no human activity is allowed is known as :
 - (1) Core zone
 - Buffer zone
 - (3) Transition zone
 - (4) Restoration zone

- 71. In case of poriferans, the spongocoel is lined with flagellated cells called :
 - 🖌 ostia
 - (2) oscula
 - (3) choanocytes
 - (4) mesenchymal cells
- 72. A decrease in blood pressure/volume will not cause the release of :
 - (1) Renin
 - (2) Atrial Natriuretic Factor
 - (3) Aldosterone
 - (4) ADH

73.

- A dioecious flowering plant prevents both :
 - (1) Autogamy and xenogamy
 - (2) Autogamy and geitonogamy
 - (3) Geitonogamy and xenogamy
 - (4) Cleistogamy and xenogamy
- 74. Which of the following facilitates opening of stomatal aperture?
 - (1) Contraction of outer wall of guard cells
 - (2) Decrease in turgidity of guard cells
 - (2) Radial orientation of cellulose microfibrils in the cell wall of guard cells
 - (4) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
- 75. The DNA fragments separated on an agarose gel can be visualised after staining with :
 - (1) Bromophenol blue
 - (2) Acetocarmine
 - (3) Aniline blue
 - 6 Ethidium bromide

81. Myelin sheath is produced by :
() Schwann Cells and Oligodendrocytes
(2) Astrocytes and Schwann Cells
(3) Oligodendrocytes and Osteoclasts
(4) Osteoclasts and Astrocytes
82. Capacitation occurs in .
() References
(2) Epididymis
(3) Vas delerens
(4) Female Reproductive tract
83. The morphological nature of the edible part of
coconut is :
(1) Perisperm
(2) Cotyledon
(3) Endosperm
(4) Pericarp
as which of the following is made up of dead cells?
(1) Vuler perophyma
(I) Xylem parenchyma
(2) Collenchynia
(3) Phenem
(4) Phioem
85. In case of a couple where the male is having a very
low sperm count, which technique will be suitable
for fertilisation ?
(1) Intrauterine transfer
(2) Gamete intracytoplasmic falloplan transfer
Artificial Insemination
(4) Intracytoplasmic sperm injection
86. Which of the following RNAs should be mos
s. (Pre-RNA
(2) t-RNA
n. (3) m-RNA
(4) mi-RNA
87. The vascular cambium normally gives rise to :

Only (c) (1)

76.

77.

78.

79.

80.

- Only (d) (2)
- (3) (a) and (b)
- (c) and (d) (4)

9

- Phelloderm (1)
- Primary phloem (2)
- ß Secondary xylem
- (4) Periderm

W

W

- 88. Which of the following options gives the correct sequence of events during mitosis?
 - condensation → nuclear membrane (1)disassembly \rightarrow crossing over \rightarrow segregation \rightarrow telophase
 - (2)condensation \rightarrow nuclear membrane disassembly \rightarrow arrangement at equator \rightarrow centromere division \rightarrow segregation \rightarrow telophase
 - condensation \rightarrow crossing over \rightarrow nuclear membrane disassembly \rightarrow segregation \rightarrow telophase
 - (4)condensation \rightarrow arrangement at equator \rightarrow centromere division \rightarrow segregation \rightarrow telophase
- **89**. Which of the following options best represents the enzyme composition of pancreatic juice ?
 - amylase, peptidase, trypsinogen, rennin (1)
 - (2)amylase, pepsin, trypsinogen, maltase
 - (31 peptidase, amylase, pepsin, rennin
 - (4) lipase, amylase, trypsinogen, procarboxypeptidase
- 90. Attractants and rewards are required for :
 - Anemophily
 - (2)Entomophily
 - (3)Hydrophily
 - (4)Cleistogamy
- 91. Two blocks A and B of masses 3m and m respectively are connected by a massless and inextensible string. The whole system is suspended by a massless spring as shown in figure. The magnitudes of acceleration of A and B immediately after the string is cut, are respectively :



92. The acceleration due to gravity at a height 1 km above the earth is the same as at a depth d below the surface of earth. Then :



93. A particle executes linear simple harmonic motion with an amplitude of 3 cm. When the particle is at 2 cm from the mean position, the magnitude of its velocity is equal to that of its acceleration. Then its time period in seconds is :

(1)	$\frac{\sqrt{5}}{\pi}$
(2)	$\frac{\sqrt{5}}{2\pi}$
3)	$\frac{4\pi}{\sqrt{5}}$
4)	$\frac{2\pi}{\sqrt{3}}$

The resistance of a wire is ' \underline{B} ' ohm. If it is melted and stretched to 'n' times its original length, its new resistance will be:



- 95. A capacitor is charged by a battery. The battery is removed and another identical uncharged capacitor is connected in parallel. The total electrostatic energy of resulting system :
 - (1)increases by a factor of 4
 - (2)decreases by a factor of 2
 - remains the same
 - (4) increases by a factor of 2

94.

99.

96. Two rods A and B of different materials are welded together as shown in figure. Their thermal conductivities are K_1 and K_2 . The thermal conductivity of the composite rod will be:



- (1) $\frac{K_1 + K_2}{2}$ (2) $\frac{3(K_1 + K_2)}{2}$
- (3) $K_1 + K_2$



- 97. The two nearest harmonics of a tube closed at one end and open at other end are 220 Hz and 260 Hz. What is the fundamental frequency of the system?
 - (1) 10 Hz
 - (2) 20 Hz
 - (3) 30 Hz
 - (4) 40 Hz
- 98. The bulk modulus of a spherical object is 'B'. If it is subjected to uniform pressure 'p', the fractional decrease in radius is :
 - (1) $\frac{P}{B}$ (2) $\frac{B}{3p}$ (3) $\frac{3p}{B}$

(4)

р

3B

- A physical quantity of the dimensions of length that e^2
- can be formed out of c, G and $\frac{e^2}{4 \pi \epsilon_0}$ is [c is velocity of light, G is universal constant of gravitation and e is charge]:



100. Figure shows a circuit that contains three identical resistors with resistance $R = 9.0 \Omega$ each, two identical inductors with inductance L=2.0 mH each, and an ideal battery with emf $\varepsilon = 18 \text{ V}$. The current 'i' through the battery just after the switch closed is,.....



- 101. One end of string of length *l* is connected to a particle of mass 'm' and the other end is connected to a small peg on a smooth horizontal table. If the particle moves in circle with speed 'v', the net force on the particle (directed towards center) will be (T represents the tension in the string)
 - (1) T (2) $T + \frac{m v^2}{l}$ (3) $T - \frac{m v^2}{l}$
 - (4) Zero

102. The photoelectric threshold wavelength of silver is 3250×10^{-10} m. The velocity of the electron ejected from a silver surface by ultraviolet light of wavelength 2536×10^{-10} m is :

(Given $h = 4.14 \times 10^{-15} \text{ eVs}$ and $c = 3 \times 10^8 \text{ ms}^{-1}$)

- (1) $\approx 6 \times 10^5 \text{ ms}^{-1}$ (2) $\approx 0.6 \times 10^6 \text{ ms}^{-1}$ (3) $\approx 61 \times 10^3 \text{ ms}^{-1}$ (4) $\approx 0.3 \times 10^6 \text{ ms}^{-1}$
- 103. Radioactive material '<u>A'</u> has decay constant '<u>8</u> λ ' and material '<u>B</u>' has decay constant '<u>\lambda'</u>. Initially they have same number of nuclei. After what time, the ratio of number of nuclei of material '<u>B</u>' to that



104. A rope is wound around a hollow cylinder of mass 3 kg and radius 40 cm. What is the angular acceleration of the cylinder if the rope is pulled with a force of 30 N?



- 105. Two cars moving in opposite directions approach each other with speed of 22 m/s and 16.5 m/s respectively. The driver of the first car blows a horn having a frequency 400 Hz. The frequency heard by the driver of the second car is [velocity of sound 340 m/s]:
 - (1) 350 Hz
 - (2) 361 Hz
 - (3) 411 Hz
 - (4) 448 Hz

- 106. A 250 Turn rectangular coil of length 2.1 cm and width 1.25 cm carries a current of 85 μA and subjected to a magnetic field of strength 0.85 T. Work done for rotating the coil by 180° against the torque
 - 9.1 μ J
 4.55 μ J
 2.3 μ J
 1.15 μ J

A is

- 107. A long solenoid of diameter 0.1 m has 2×10^4 turns per meter. At the centre of the solenoid, a coil of 100 turns and radius 0.01 m is placed with its axis coinciding with the solenoid axis. The current in the solenoid reduces at a constant rate to 0A from 4 A in 0.05 s. If the resistance of the coil is $10 \pi^2 \Omega$, the total charge flowing through the coil during this time is :
 - 32 π μC

16 µ C

(3) 32 µ C

(2)

- (4) 16 π μC
- 108. Suppose the charge of a proton and an electron differ slightly. One of them is -e, the other is $(e + \Delta e)$. If the net of electrostatic force and gravitational force between two hydrogen atoms placed at a distance d (much greater than atomic size) apart is zero, then Δe is of the order of [Given mass of hydrogen $m_h = 1.67 \times 10^{-27} \text{ kg}$]
 - (1) 10^{-20} C
 - (2) 10^{-23} C
 - (3) 10^{-37} C

(4)

 10^{-47} C

- 109. Two astronauts are floating in gravitational free space after having lost contact with their spaceship. The two will :
 - (1) keep floating at the same distance between them.
 - (2) move towards each other.
 - (3) move away from each other.
 - (4) will become stationary.

114.

- 110. The ratio of wavelengths of the last line of Balmer series and the last line of Lyman series is :
 - (1) 2
 - (2) 1
 - (3) 4
 - (4) 0.5
- 111. The de-Broglie wavelength of a neutron in thermal equilibrium with heavy water at a temperature T (Kelvin) and mass m, is :

(1)
$$\frac{h}{\sqrt{mkT}}$$

(2)
$$\frac{h}{\sqrt{3mkT}}$$

(3)
$$\frac{2h}{\sqrt{3mkT}}$$

$$(4) \quad \frac{2\pi}{\sqrt{mkT}}$$

- 112. A thin prism having refracting angle 10° is made of glass of refractive index 1.42. This prism is combined with another thin prism of glass of refractive index 1.7. This combination produces dispersion without deviation. The refracting angle of second prism should be:
 - (1) 4°
 - (2) 6°
 - (3) 8°
 - (4) 10°
- 113. Thermodynamic processes are indicated in the following diagram.





A U tube with both ends open to the atmosphere, is partially filled with water. Oil, which is immiscible with water, is poured into one side until it stands at a distance of 10 mm above the water level on the other side. Meanwhile the water rises by 65 mm from its original level (see diagram). The density of the oil is :



- 115. A spring of force constant k is cut into lengths of ratio 1:2:3. They are connected in series and the new force constant is k'. Then they are connected in parallel and force constant is k". Then k': k" is :
 - (1) 1:6
 - (2) 1:9
 - (3) 1:11
 - (4) 1:14
- 116. Which of the following statements are correct?
 - (a) Centre of mass of a body always coincides with the centre of gravity of the body.
 - (b) Centre of mass of a body is the point at which the total gravitational torque on the body is zero.
 - (c) A couple on a body produce both translational and rotational motion in a body.
 - (d) Mechanical advantage greater than one means that small effort can be used to lift a large load.
 - (1) (b) and (d)
 - (2) (a) and (b)
 - (3) (b) and (c)
 - (4) (c) and (d)

- 117. A beam of light from a source L is incident normally on a plane mirror fixed at a certain distance x from the source. The beam is reflected back as a spot on a scale placed just above the source L. When the mirror is rotated through a small angle θ , the spot of the light is found to move through a distance y on the scale. The angle θ is given by :
 - $(1)' \quad \frac{y}{2x}$ $(2) \quad \frac{y}{x}$ $(3) \quad \frac{x}{2y}$ $(4) \quad \frac{x}{y}$
- 118. A gas mixture consists of 2 moles of O_2 and 4 moles of Ar at temperature T. Neglecting all vibrational modes, the total internal energy of the system is :

epol an

- (1) 4 RT
 15 RT
 (3) 9 RT
 (4) 11 RT
- 119. Consider a drop of rain water having mass 1g falling from a height of 1 km. It hits the ground with a speed of 50 m/s. Take 'g' constant with a value 10 m/s². The work done by the (i) gravitational force and the (ii) resistive force of air is:
 - (1) (i) -10 J (ii) -8.25 J(2) (i) 1.25 J (ii) -8.25 J(3) (i) 100 J (ii) 8.75 J(4) (i) 10 J (ii) -8.75 J(4) (i) 10 J (ii) -8.75 J
- 120. A carnot engine having an efficiency of $\frac{1}{10}$ as heat engine, is used as a refrigerator. If the work done on the system is 10 J, the amount of energy absorbed from the reservoir at lower temperature is :
 - (1) 1 J (2) 90 J (3) 99 J (4) 100 J $\sqrt{2}$

121. An arrangement of three parallel straight wires placed perpendicular to plane of paper carrying same current 'I' along the same direction is shown in Fig. Magnitude of force per unit length on the middle wire 'B' is given by :



- 122. The x and y coordinates of the particle at any time are $x = 5t - 2t^2$ and y = 10t respectively, where x and y are in meters and t in seconds. The acceleration of the particle at t = 2s is :
 - (1) 0
 - (2) 5 m/s^2
 - (3) -4 m/s^2
 - (4) -8 m/s^2
- 123. The ratio of resolving powers of an optical microscope for two wavelengths $\lambda_1 = 4000$ Å and $\lambda_2 = 6000$ Å is :
 - (1) 8:27(2) 9:4(3) 3:2(4) 16:81

124. Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time t_1 . On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time t_2 . The time taken by her to walk up on the moving escalator will be :

$$\frac{t_1+t_2}{2}$$

- (2) $\frac{t_1t_2}{t_2-t_1}$
- (3) $\frac{t_1 t_2}{t_2 + t_1}$
- (4) $t_1 t_2$
- 125. A spherical black body with a radius of 12 cm radiates 450 watt power at 500 K. If the radius were halved and the temperature doubled, the power radiated in watt would be
 - (1) 225 $Y_{2} | 2 Cm$ (2) 450 $T = 300 \text{ k}^{1000}$ (3) 1000 $P = 300 \text{ k}^{1000}$
- 126. A potentiometer is an accurate and versatile device to make electrical measurements of E.M.F. because the method involves :
 - (1) cells
 - (2) potential gradients
 - (3) a condition of no current flow through the galvanometer
 - a combination of cells, galvanometer and resistances

0

127. The given electrical network is equivalent to :



- (3) NOR gate
- (4) NOT gate

- **128.** In a common emitter transistor amplifier the audio signal voltage across the collector is 3 V. The resistance of collector is $3 k\Omega$. If current gain is 100 and the base resistance is $2 k\Omega$, the voltage and power gain of the amplifier is :
 - (1) 200 and 1000
 - (2) 15 and 200
 - (3) 150 and 15000
 - (4) 20 and 2000
- 129. Two discs of same moment of inertia rotating about their regular axis passing through centre and perpendicular to the plane of disc with angular velocities ω_1 and ω_2 . They are brought into contact face to face coinciding the axis of rotation. The expression for loss of energy during this process is :
 - (1) $\frac{1}{2} I (\omega_1 + \omega_2)^2$
 - (2) $\frac{1}{4} I (\omega_1 \omega_2)^2$
 - (3) $I(\omega_1 \omega_2)^2$

$$(4) \quad \frac{\mathrm{I}}{8} (\omega_1 - \omega_2)^2$$

- 130. Young's double slit experiment is first performed in air and then in a medium other than air. It is found that 8th bright fringe in the medium lies where 5th dark fringe lies in air. The refractive index of the medium is nearly :
 - (1) 1.25
 - (2) 1.59
 - (3) 1.69
 - (4) 1.78
- 131. Which one of the following represents forward bias diode?



- W
- 132. Two Polaroids P_1 and P_2 are placed with their axis perpendicular to each other. Unpolarised light Io is incident on P1. A third polaroid P3 is kept in between P1 and P2 such that its axis makes an angle 45° with that of P1. The intensity of transmitted light through P2 is

(1)
$$\frac{I_0}{2}$$

(2) $\frac{I_0}{4}$
(3) $\frac{I_0}{8}$
(4) $\frac{I_0}{16}$

In an electromagnetic wave in free space the root 133. mean square value of the electric field is $E_{rms} = 6V/m$. The peak value of the magnetic field is :

- (1) 1.41×10^{-8} T
- 2.83×10^{-8} T (2)
- (3) 0.70×10^{-8} T
- (4) 4.23×10^{-8} T
- **134.** If θ_1 and θ_2 be the apparent angles of dip observed in two vertical planes at right angles to each other, then the true angle of dip θ is given by :
 - $\cot^2\theta = \cot^2\theta_1 + \cot^2\theta_2$ (1)
 - (2) $\tan^2\theta = \tan^2\theta_1 + \tan^2\theta_2$
 - (3) $\cot^2\theta = \cot^2\theta_1 - \cot^2\theta_2$
 - $\tan^2\theta = \tan^2\theta_1 \tan^2\theta_2$ (4)

135. The diagrams below show regions of equipotentials.



A positive charge is moved from A to B in each diagram.

- (1)Maximum work is required to move q in figure (c).
- In all the four cases the work done is the same. (2)
- (3)Minimum work is required to move q in figure (a).
- (4) Maximum work is required to move q in figure (b).

136. The reason for greater range of oxidation states in actinoids is attributed to :

- (1)the radioactive nature of actinoids
- (2)actinoid contraction
- (3)5f, 6d and 7s levels having comparable energies
- 4f and 5d levels being close in energies (4)
- 137. An example of a sigma bonded organometallic compound is :
 - (1)Ruthenocene
 - (2)Grignard's reagent
 - Ferrocene
 - Cobaltocene (4)

Which one is the wrong statement? 138.

- de-Broglie's wavelength is given by $\lambda = -\frac{h}{---}$ (1) where m = mass of the particle, v = groupvelocity of the particle.
- - The uncertainty principle is $\Delta E \times \Delta t \ge h_{4\pi}$.
- (3) Half filled and fully filled orbitals have greater stability due to greater exchange energy, greater symmetry and more balanced arrangement.
- (4) The energy of 2s orbital is less than the energy of 2p orbital in case of Hydrogen like atoms.
- 139. Mixture of chloroxylenol and terpineol acts as :
 - (1) analgesic
 - (2)antiseptic
 - antipyretic
 - (4)antibiotic
- The element Z = 114 has been discovered recently. **140**. It will belong to which of the following family/group and electronic configuration?
 - (1)Halogen family, [Rn] 5f14 6d10 7s2 7p5
 - (2)Carbon family, [Rn] 5f¹⁴ 6d¹⁰ 7s² 7p²
 - (3)Oxygen family, [Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁴
 - (4) Nitrogen family, [Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁶

16

141. A 20 litre container at 400 K contains $CO_2(g)$ at pressure 0.4 atm and an excess of SrO (neglect the volume of solid SrO). The volume of the container is now decreased by moving the movable piston fitted in the container. The maximum volume of the container, when pressure of CO_2 attains its maximum value, will be :

> (Given that : $SrCO_3(s) \Rightarrow SrO(s) + CO_2(g)$, Kp=1.6 atm)

- (1) 5 litre
- (2) 10 litre
- (3) 4 litre
- (4) 2 litre
- 142. Predict the correct intermediate and product in the following reaction :

(2) A:
$$H_3C-C=CH_2$$
 B: $H_3C-C=CH_2$
OH SO₄

(3) **A**:
$$H_3C - C - CH_3$$
 B: $H_3C - C \equiv CH$

(4)
$$\mathbf{A}: \mathbf{H}_{3}\mathbf{C}-\mathbf{C}=\mathbf{C}\mathbf{H}_{2} \quad \mathbf{B}: \mathbf{H}_{3}\mathbf{C}-\mathbf{C}-\mathbf{C}\mathbf{H}_{3}$$

OH O

143. Which of the following is a sink for CO?

Haemoglobin

- (2) Micro organisms present in the soil
- (3) Oceans
- (4) Plants
- **144.** Which of the following reactions is appropriate for converting acetamide to methanamine?
 - (1) Carbylamine reaction
 - (2) Hoffmann hypobromamide reaction
 - (3) Stephens reaction
 - (4) Gabriels phthalimide synthesis

145. The species, having bond angles of 120° is :

- PH₃
 CIF₃
 NCl₃
 BCl₃
- 146. The correct order of the stoichiometries of AgCl formed when AgNO₃ in excess is treated with the complexes : CoCl₃.6 NH₃, CoCl₃.5 NH₃, CoCl₃.4 NH₃ respectively is :
 - (1) 1 AgCl, 3 AgCl, 2 AgCl
 - (2) 3 AgCl, 1 AgCl, 2 AgCl
 - (3) 3 AgCl, 2 AgCl, 1 AgCl
 - (4) 2 AgCl, 3 AgCl, 1 AgCl
- 147. For a given reaction, $\Delta H = 35.5 \text{ kJ mol}^{-1}$ and $\Delta S = 83.6 \text{ JK}^{-1} \text{ mol}^{-1}$. The reaction is spontaneous at : (Assume that ΔH and ΔS do not vary with temperature)

(4) T > 298 K

148. Match the interhalogen compounds of column I with the geometry in column II and assign the correct code.

	Colum	n I		Column II	
(a)	XX′		(i)	T - shape	
(b)	xx' ₃		(ii)	Pentagonal bipyramidal	
(c)	xx ₅ /	/	(iii)	Linear	
(d)	xx ₇		(iv)	Square - pyramidal	
			(v)	Tetrahedral	
Code	e: Joonb				
	(a)	(b)	(c)	(d)	
(1)	(iii)	(iv)	(i)	(ii)	
(2)	(iii)	(i)	(iv)	(ii)	
(3)	(v)	(iv)	(iii)	(ii)	
(4)	(iv)	(iii)	(ii)	(i) (i)	

W

149. Identify A and predict the type of reaction |



- 150. Which one of the following statements is not correct?
 - (I) Catalyst does not initiate any reaction.
 - (2) The value of equilibrium constant is changed in the presence of a catalyst in the reaction at equilibrium.
 - (3) Enzymes catalyse mainly bio-chemical reactions.
 - (4) Coenzymes increase the catalytic activity of enzyme.
- 151. Name the gas that can readily decolourise acidified $KMnO_4$ solution :
 - (1) CO_2 (2) SO_2 (3) NO_2 (4) P_2O_5

152. The correct increasing order of basic strength for the following compounds is :



- (3) III < II < I
- $(4) \qquad II < I < III$

18

153. If molality of the dilute solution is doubled, the value of molal depression constant (K_f) will be:

(1)	doubled
25	halved

- (3) tripled
- (4) unchanged
- **154.** Of the following, which is the product formed when cyclohexanone undergoes aldol condensation followed by heating?









155. The equilibrium constants of the following are :

 \mathbf{K}_1

 K_2

- $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$ $N_2 + O_2 \rightleftharpoons 2 NO$
- $H_2 + \frac{1}{2}O_2 \rightarrow H_2O$ K₃

The equilibrium constant (K) of the reaction :

 $2 \text{ NH}_3 + \frac{5}{2} \text{ O}_2 \stackrel{\text{K}}{=} 2 \text{ NO} + 3 \text{ H}_2\text{O}$, will be:

- $K_1 K_3^3 / K_2$ (1)
- (2) $K_2 K_3^3 / K_1$ (3) $K_2 K_3 / K_1$
- $K_{2}^{3} K_{3}/K_{1}$ (4)

156. The correct statement regarding electrophile is :

- (1)Electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from a nucleophile
- Electrophile is a negatively charged species (2) and can form a bond by accepting a pair of electrons from another electrophile
- Electrophiles are generally neutral species (3) and can form a bond by accepting a pair of electrons from a nucleophile
- (4) Electrophile can be either neutral or positively charged species and can form a bond by accepting a pair of electrons from a nucleophile
- A gas is allowed to expand in a well insulated 157. container against a constant external pressure of 2.5 atm from an initial volume of 2.50 L to a final volume of 4.50 L. The change in internal energy ΔU of the gas in joules will be :
 - 1136.25 J (1)
 - (2)- 500 T
 - (3)- 505 J
 - + 505 I (4)

- 158. Which of the following pairs of compounds is isoelectronic and isostructural?
 - BeCl₂, XeF₂ (1)
 - Tel₂, XeF₂ (2)
 - IBr₂, XeF₂ (3)
 - (4) IF₂, XeF₂

159. Which is the incorrect statement?

- FeO_{0.98} has non stoichiometric metal (1)deficiency defect.
- Density decreases in case of crystals with (2)Schottky's defect.
- (3)NaCl(s) is insulator, silicon is semiconductor, silver is conductor, quartz is piezo electric crystal.

Frenkel defect is favoured in those ionic compounds in which sizes of cation and anions are almost equal.

- The heating of phenyl-methyl ethers with HI 160. produces. CHSOON CHSON + CHSON
 - (1) ethyl chlorides
 - (2) iodobenzene
 - (3) phenol
 - (4)benzene
- 161. Correct increasing order for the wavelengths of absorption in the visible region for the complexes of Co^{3+} is :
 - $[Co(en)_{3}]^{3+}, [Co(NH_{3})_{6}]^{3+}, [Co(H_{2}O)_{6}]^{3+}$ (1)
 - $[Co(H_2O)_6]^{3+}, [Co(en)_3]^{3+}, [Co(NH_3)_6]^{3+}$ (2)
 - $[C_0(H_2O)_6]^{3+}, [C_0(NH_3)_6]^{3+}, [C_0(en)_3]^{3+}$ (3)
 - $[Co(NH_3)_6]^{3+}, [Co(en)_3]^{3+}, [Co(H_2O)_6]^{3+}$ (4)
- Pick out the correct statement with respect to 162. $[Mn(CN)_6]^{3-}$:
 - It is sp³d² hybridised and octahedral (1)
 - It is sp³d² hybridised and tetrahedral
 - It is d²sp³ hybridised and octahedral (3)
 - It is dsp² hybridised and square planar (4)
- With respect to the conformers of ethane, which of 163. the following statements is true?
 - (1) Bond angle remains same but bond length changes
 - Bond angle changes but bond length remains (2)same
 - Both bond angle and bond length change (3)
 - Both bond angles and bond length remains same

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- 164. Which of the following is dependent on temperature?
 - (1) Molality
 - (2) Molarity
 - 3 Mole fraction
 - (4) Weight percentage

165. Which of the following statements is not correct?

- (1) Insulin maintains sugar level in the blood of a human body.
- (2) Ovalbumin is a simple food reserve in egg white.
 - (3) Blood proteins thrombin and fibrinogen are involved in blood clotting.
 - (4) Denaturation makes the proteins more active.

166. The IUPAC name of the compound

is

- (1) 3-keto-2-methylhex-4-enal
- 2/ 5-formylhex-2-en-3-one
- (3) 5-methyl-4-oxohex-2-en-5-al
- (4) 3-keto-2-methylhex-5-enal
- **167.** HgCl₂ and I₂ both when dissolved in water containing I⁻ ions the pair of species formed is :
 - (1) HgI_2, I_3^-
 - 2) HgI₂, I⁻
 - (3) HgI_4^{2-}, I_3^{-}
 - (4) Hg₂I₂, I⁻
- 168. It is because of inability of ns² electrons of the valence shell to participate in bonding that :
 - (1) Sn^{2+} is reducing while Pb^{4+} is oxidising
 - (2) Sn^{2+} is oxidising while Pb^{4+} is reducing
 - (3) Sn²⁺ and Pb²⁺ are both oxidising and reducing
 - (4) Sn^{4+} is reducing while Pb^{4+} is oxidising

- **169.** Mechanism of a hypothetical reaction $X_2 + Y_2 \rightarrow 2 XY$ is given below :
 - (i) $X_2 \rightarrow X + X$ (fast)
 - (ii) $X + Y_2 \rightleftharpoons XY + Y$ (slow)
 - (iii) $X + Y \rightarrow XY$ (fast)

The overall order of the reaction will be :

- (1) 1
- (2) 2
- (3) 0
- (4) 1.5
- 170. Concentration of the Ag⁺ ions in a saturated solution of $Ag_2C_2O_4$ is 2.2×10^{-4} mol L⁻¹. Solubility product of $Ag_2C_2O_4$ is :
 - (1) 2.42×10^{-8}
 - (2) 2.66×10^{-12}
 - (3) 4.5×10^{-11}
 - (4) 5.3×10^{-12}
- **171.** Extraction of gold and silver involves leaching with CN⁻ ion. Silver is later recovered by :
 - (1) liquation
 - (2) distillation
 - (3) zone refining
 - (4) displacement with Zn
- 172. Which one is the correct order of acidity ?
 - (1) $CH_2 = CH_2 > CH_3 CH = CH_2 > CH_3 C \equiv CH > CH \equiv CH$
 - (2) $CH \equiv CH > CH_3 C \equiv CH > CH_2 = CH_2 > CH_3 CH_3$
 - (3) $CH \equiv CH > CH_2 = CH_2 > CH_3 C \equiv CH > CH_3 CH_3$
 - (4) $CH_3 CH_3 > CH_2 = CH_2 > CH_3 C = CH > CH = CH$
- 173. Ionic mobility of which of the following alkali metal ions is lowest when aqueous solution of their salts are put under an electric field ?
 - (1) Na
 (2) K
 (3) Rb
 (4) Li

$$(C_{2}H_{6}O)^{/573} \stackrel{K}{\longrightarrow} A \xrightarrow{[Ag(NH_{3})_{2}]^{+}}_{OH \Delta}$$
Silver mirror observed
$$OH, \Delta$$
$$O$$
$$NH_{2}-NH-C-NH_{2}$$

Identify A, X, Y and Z

- (1) A-Methoxymethane, X-Ethanoic acid, Y-Acetate ion, Z-hydrazine.
- (2) A-Methoxymethane, X-Ethanol, Y-Ethanoic acid, Z-Semicarbazide.
- (3) A-Ethanal, X-Ethanol, Y-But-2-enal, Z-Semicarbazone.
- (4) A-Ethanol, X-Acetaldehyde, Y-Butanone, Z-Hydrazone.
- 175. In which pair of ions both the species contain S-S bond ?
 - (1) $S_2O_7^{2-}, S_2O_3^{2-}$
 - (2) $S_4O_6^{2-}, S_2O_3^{2-}$
 - (3) $S_2O_7^{2-}, S_2O_8^{2-}$
 - (4) $S_4O_6^{2-}, S_2O_7^{2-}$
- 176. Which one is the most acidic compound?



21

 $Zn|ZnSO_4 (0.01 M)|| CuSO_4 (1.0 M)|Cu, the emf of this Daniel cell is E₁. When the concentration of <math>ZnSO_4$ is changed to 1.0 M and that of $CuSO_4$ changed to 0.01 M, the emf changes to E₂. From the followings, which one is the relationship between

E₁ and E₂? (Given,
$$\frac{RT}{F} = 0.059$$
)
(1) E₁ = E₂
(2) E₁ < E₂
(3) E₁ > E₂
(4) E₂ = 0 \neq E₁

- **178.** A first order reaction has a specific reaction rate of $10^{-2} \sec^{-1}$. How much time will it take for 20 g of the reactant to reduce to 5 g?
 - 238.6 sec
 - (2) 138.6 sec
 - (3) 346.5 sec
 - (4) 693.0 sec
- **179.** The most suitable method of separation of 1 : 1 mixture of ortho and para nitrophenols is :
 - Sublimation
 - (2) Chromatography
 - (3) Crystallisation
 - (4) Steam distillation
- **180.** Which one of the following pairs of species have the same bond order ?

-000-

- (1) CO, NO
- (2) O_2 , NO⁺
- (3) CN⁻, CO
- (4) N_2, O_2^-

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Test Booklet Code

VANI

No.: 6311632



This Booklet contains 24 pages.

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

Important Instructions :

- 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.
- 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.
- 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 Z. Make sure that the CODE printed on Side-2 of the Answer Sheet is the same as that on this 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.
- 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 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.
- The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.

z			2		
1.	The	vascular cambium normally gives rise to :	6.	Coco	nut fruit is a :
4	0)	Secondary xylem		(1)	Nut
L	(2)	Periderm		(2)	Capsule
	(3)	Phelloderm	1	135	Drupe
	(4)	Primary phloem		(4)	Berry
2.	Whie	ch of the following is made up of dead cells?	7.	The	morphological nature of the edible part of
4	(1)	Phellem		T	`Endosperm
	(2)	Phloem	14	(2)	Pericarp
	(3)	Xylem parenchyma		(3)	Perisperm
	(4)	Collenchyma		(4)	Cotyledon
3.	Doul	ole fertilization is exhibited by :	8.	Iden	tify the wrong statement in context of
	(1)	Fungi		nearr	WOOD:
L	BI	Angiosperms	2		It conducts water and allowerts with highly
	(3)	Gymnosperms		(2)	lignified walls
	(+)	· · · · · · · · · · · · · · · · · · ·		(3)	Organic compounds are deposited in it
4.	With photo is not	reference to factors affecting the rate of osynthesis, which of the following statements correct?	9.	(4) The fi	It is highly durable inal proof for DNA as the genetic material came
-	11	C ₃ plants respond to higher temperatures		from	the experiments of :
c		with enhanced photosynthesis while C_4 plants have much lower temperature		(1)	Avery, Mcleod and McCarly
	-	optimum		(2)	Hargobind Khorana
	(2)	Tomato is a greenhouse crop which can be grown in CO_2 - enriched atmosphere for higher yield	2	(3)	Griffith 'Hershey and Chase
	(3)	Light saturation for CO_2 fixation occurs at 10% of full sunlight	10.	Which conse	th one of the following is related to Ex-situ ervation of threatened animals and plants?
	(4)	Increasing atmospheric CO ₂ concentration		(1)	Amazon rainforest
		up to 0.05% can enhance CO ₂ fixation rate		(2)	Himalayan region •
5	Whic	h statement is wrong for Krebs' cycle?	V	(3)	Wildlife Safari parks
	(1)	During conversion of succinvl CoA to		(4)	Biodiversity hot spots
1	(1)	succinic acid, a molecule of GTP is synthesised	11.	Duri	ng DNA replication, Okazaki fragments are
4	27	The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid		(1)	The leading strand away from replication
	(3)	There are three points in the cycle where NAD^+ is reduced to $NADH + H^+$	*	B	The lagging strand away from the replication fork.
	(4)	There is one point in the cycle where FAD+		(3)	The leading strand towards replication fork.
	,-	is reduced to FADH ₂		(4)	The lagging strand towards replication fork.
				5	Sent
					the set

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7.						4			
24.	<u>A</u> c non (1)	lisease c -disjuncti Turner	aused b on is : 's Syndro	y an a me	utosoma primary	28.	Out true valu	of 'X' pairs of ril ribs. Select the c es of X and Y an	os in humans only 'Y' pairs are option that correctly represents d provides their explanation :
	(2) (3) (4)	Sickle C Down's Klinefe	Cell Anen Syndroi Iter's Syn	nia ne drome	YO		(1)	X = 24, Y = 7	True ribs are dorsally attached to vertebral column but are free on ventral side.
25.) Sele	ct the corr frogs :	ect route	for the	passage of sperms in	L .	(2)	X=24, Y=12	True ribs are dorsally attached to vertebral column but are free on ventral side.
15	(1)	Testes - \rightarrow Uref	\rightarrow Vasa e er \rightarrow Clo	efferent baca	$ia \rightarrow Bidder's canal$	12	B	X=12, Y=7	True ribs are attached dorsally to vertebral column
43	(2)	Bidder Cloaca	\rightarrow Vasa s canal	\rightarrow Uri	$\frac{ntia}{\rightarrow Kidney} \rightarrow \frac{1}{2}$		(4)	X=12, Y=5	True ribs are attached dorsally to vertebral column
	(3)	Testes – efferent	\rightarrow Bidden ia \rightarrow Uri	<u>'s cana</u> nogenit	<u>l → Kidney →</u> Vasa tal duct → Cloaca 🗭	4			and sternum on the two ends.
	(4)	<u>Testes</u> <u>Seminal</u> <u>Cloaca</u>	→ <u>Vasa</u> Vesicle	\rightarrow U ₁	$\frac{\text{ntia}}{\text{rinogenital duct}} \rightarrow \frac{\text{Kidney}}{\text{rinogenital duct}} \rightarrow \frac{1}{2}$	29.)Whic	h ecosystem has	s the maximum biomass?
	X 4 77 .	1 6.1 6				•	(1)	Pond ecosystem	m
26.	for ex	th of the fo stracting of ?	energy fr	ell orga om car	nelles is responsible bohydrates to form		(2)	Lake ecosystem	n
	(1)	Chlorop	last			1-	BJ.	Forest ecosyste	m
Y	(3)	Mitocho Lysosom	ndrion				(4)	Grassland eco	system
	(4)	Ribosom	e						
						30.	Viroi	ds differ from vi	iruses in having :
27.	disea (Colu	ses (Colu mn-II) a	mn - I) nd select	y sexu with th the cor	ally transmitted eir causative agent rect option.		(1)	RNA molecule	es with protein coat
		Column	-I		Column - II	4	P)	RNA molecule	s without protein coat
38" 1 877 25 5 5 5	(a)	Gonorrh	ea	(i)	HIV		(3) =	DNA molecule	es with protein coat
•	(c)	Genital V	Varts	(iii)	Treponema		(4)	DNA molecule	es without protein coat
	(d).	AIDS		(iv)	Human Papilloma - Virus	31.	Selec	t the mismatch :	
	Opno	(a) (b)	(1)	(4)	9m		(1)	Anahaena	Nitrogen fiver
	(1)	(iv) (ii)	(iii)	(i)			(1)	Rhizobium	- <u>Alfalfa</u>
	(2)	(iv) (iii) (ii)	(i)			(3)	Frankia	Almus
2	(4)	(II) (III (iiii) (iv) (IV)	(1)	· · ·		0	- I WIELER	
	()	(11) (11)	(1)	(11)	· ·	12	(1)	Rhodospirillum	- Mycorrhiza






Z	- 8	3		
63.	Flowers which have single ovule in the ovary and	69.	Attrac	tants and rewards are required for :
	are packed into inflorescence are usually pollinated		(1)	Hydrophily
	by:		(2)	Cleistogamy
1	(A) Wind		(3)	Anemonhily
	(2) Bat		(0)	Entemonity
	(3) Water	Y	141	Entomophily
	(4) Bee	70.	Select	the mismatch :
64	Functional megaspore in an angiosperm develops		(1)	Salvinia - Heterosporous
01.	into:	-	(2)	Equisetum - Homosporous
~	TE Embryo sac		131	Pinus - Dioecious
L	(2) Embryo	E	(4)	Cucas - Dioecious
•	(3) Ovule		•	Cycus 2.00000
	(4) Endosperm	71.	GnRH	I, a hypothalamic hormone, needed in
	(-)		reproc	duction, acts on :
65.	Which one from those given below is the period for Mendel's hybridization experiments?		(1)	posterior pituitary gland and stimulates secretion of oxytocin and FSH.
`	(1) $1857 - 1869$ $1857 - 1877$ $1857 - 1877$		(2)	posterior pituitary gland and stimulates secretion of LH and relaxin.
	(2) 1070 - 1077 - (856		(3)	anterior pituitary gland and stimulates
2	137 1856 - 1863		(-)	secretion of LH and oxytocin.
	(4) 1840 - 1850	-	11	anterior pituitary gland and stimulates
66.	An example of colonial alga is :	10		Secretorion Errand Port.
	(1) Ulothrix	72.	Which	h cells of 'Crypts of Lieberkuhn' secrete
	(2) Spirogyra		antiba	acterial lysozyme ?
· .	(3) Chlorella		(1)	Zymogen cells
	Volvox	P	(2)	Kupffer cells X
Ľ			(3)	Argentaffin cells
67.	Transplantation of tissues/organs fails often due		TAT.	Paneth cells
	of immune-response is responsible for such	1. 2		
	rejections?	73.	Myeli	in sheath is produced by :
	(1) Hormonal immune response		(1)	Oligodendrocytes and Osteoclasts
	(2) Physiological immune response		(2)	Osteoclasts and Astrocytes
, .	(3) Autoimmune response	1	137	Schwann Cells and Oligodendrocytes
	Cell - mediated immune response	12	(4)	Astrocytes and Schwann Cells
x			(-/	
68.	In case of a couple where the male is having a very low sperm coun, which technique will be suitable	74.	Whic	h of the following components provides sticky acter to the bacterial cell?
	(1) Artificial Incomination		(1)	Plasma membrane
	The second secon		127	Glycocalyx
2	intracytoplasnuc sperm injection	L	(3)	Cell wall
	(3) Intrauterine transfer		(4)	Nuclear membrane
	(4) Gamete intracytoplasmic fallopian transfer	1	(-)	



9

Z





17(EV) (5.7 1 11.41 Z 12 104. In the electron homical call : 109. It is because of inability of us oles from of the valence shell to participate in bonding that Zn ZnSO4 (0.01 M) CuSO4 (1.0 M) Cu, the emf of this Daniel cell is E1. When the concentration of (1) Sn2+ and Pb2+ are both oxidising and ZnSO₄ is changed to 1.0 M and that of CuSO₄ reducing changed to 0.01 M, the emf changes to E2. From the D Tollowings, which one is the relationship between Sn⁴⁺ is reducing while Pb⁴⁺ is oxidising V (2)Sn2+ is reducing while Pb4+ is oxidising (F) E1 and E2? (Given, 20.059) Sn²⁺ is oxidising while Pb⁴⁺ is reducing (4) $E_1 > E_2$ (2) $E_2 = 0 \neq E_1$ 120 With respect to the conformers of ethane, which of (3) $E_1 = E_2$ the following statements is true? $E_1 < E_2$ (4) Both bond angle and bond length change (1) 105. Ionic mobility of which of the following alkali metal ions is lowest when aqueous solution of their salts Both bond angles and bond length remains (2) are put under an electric field ? same E Cel (1)Rb Bond angle remains same but bond length 12P Li changes Na (3)6 ⁷Bond angle changes but bond length remains (4) Κ d same S 11/3 106: Correct increasing order for the wavelengths of absorption in the visible region for the complexes of . 11. Which of the following pairs of compounds is 603+ is isoelectronic and isostructural? $[Co(H_2O)_6]^3 + [Co(NH_3)_6]^3 + [Co(en)_3]^3 +$ (1) $[Co (NH_3)_6]^3 f_{*} [Co (en)_3]^{3+} [Co (H_2O)_6]^3 t_{*} [Co (en)_3]^3 f_{*} [Co (NH_2)_6]^{3+} [Co (H_2O)_6]^{3+}$ IBro), XeFo 6.5 $[C_0(H_2O)_6]^{3+}, [C_0(en)_3]^{3+}, [C_0(NH_3)_6]^{3+}$ (4) (2)(3)Mixture of chloroxylenol and terpineol acts as : 107. (1) antipyretic (4) antibiotic analgesic 112. The reason for greater range of oxidation states in antiseptic actinoids is attributed to : redict the correct intermediate and product in the II-5f, 6d and 7s levels having comparable following reaction: ('A energies $H_3C - C \equiv CH \xrightarrow{H_2O, H_2SO_4} intermediate \longrightarrow$ 4f and 5d levels being close in energies (2)→ product (3) the radioactive nature of actinoids 🌱 A: $H_3C - C - CH_3$ B: $H_3C - C \equiv CH$ (4) actinoid contraction ~ (1)113. Which of the following statements is not correct? A: $H_3C-C=CH_2$ B: $H_3C-C-CH_3$ OH O (1) Blood proteins thrombin and fibrinogen are involved in blood clotting. (3) A: $H_3C-C=CH_2$ B: $H_3C-C-CH_3$ SO₄ O Denaturation makes the proteins more active. (3) Insulin maintains sugar level in the blood of a human body. A: $H_3C-C=CH_2$ B: $H_3C-C=CH_2$ OH SO (4) (4) Ovalbumin is a simple food reserve in egg white





132. Extraction of gold and silver involves leaking with (A) too. Silver is hier recovered by: (I) zequerating (I) zequerating (I) zequerating (I) zequerating (I) is quarted (I) is q	1.	5 Z
CN-ion silver is hater recovered by: a can exfining a can exfine the correct order of acditiv? a consistence of the correct order of acditiv? a consistence of the correct order of acditiv? a construction of a construction (a) distillation a construction (b) construction (c) constructio	132. Extraction of gold and silver involves leaching with	137. Two Polaroids P_1 and P_2 are placed with their axis
1) zone refining (i) zone refining (i) displacement with Zn (i) displacement with Zn (i) distillation 13. Which one is the correct order of acidity? (i) distillation 13. Which one is the correct order of acidity? (i) $CH_{3} = CH_{2} > CH_{2} = CH_{2} > CH_{3} = C = CH > CH_{3} = C$	CN ⁻ ion. Silver is later recovered by:	perpendicular to each other. Unpolarised light I0 is
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $	(1) zone refining	incident on P ₁ . A third polaroid P ₃ is kept in
(a) distillation (b) distillation (c) distill	(1) diaple comont with 7n	between P_1 and P_2 such that its axis makes an angle
(a) Equation (b) Equation (c) distillation (c) distillation ((z) <u>displacement with Zit</u>	through P is:
(4) distillation 133. Which one is the correct order of acidity? $\begin{array}{c} (1) & (1) $	(3) liquation	Mought 215.
133. Which one is the correct order of acidity? $(1) CH=CH > CH_2 - CH_2 > CH_3 - C=CH > CH_2 - CH_3 - CH_3 - CH_3 - CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3 - CH$	(4) distillation	
133. Which one is the correct or der of acidity? $(1) CH_{3}-CH_{2} > CH_{2}-CH_{2} > CH_{3}-C=CH > CH_{3}-CH_{2} > CH_{3}-CH_{2} > CH_{3}-CH_{2} = CH_{2} > CH_{3}-CH_{2} > CH_{3}-CH_{2} = CH_{2} > CH_{3}-CH_{3}-CH_{4} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{2} = CH_{2} > CH_{3}-CH_{3}-CH_{3}-CH_{4} > CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{4} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3} > CH_{3}-CH_{3}-CH_{3$		8
CH=CH > CH ₂ = CH ₂ > CH ₃ - C=CH > (1) CH ₃ = CH ₃ > CH ₂ = CH ₂ > CH ₃ - C=CH > (2) CH ₃ = CH ₃ > CH ₃ - CH = CH ₂ > CH ₃ - C=CH > (3) CH ₂ = CH ₂ > CH ₃ - CH = CH ₂ > CH ₃ - C = (4) CH = CH > CH ₃ - CH = CH ₂ > CH ₃ - C = (4) CH = CH > CH ₃ - CH = CH ₂ > CH ₂ - CH ₂ = (4) CH ₃ - CH ₃ - CH = CH ₂ > CH ₂ - CH ₂ = (5) CH = CH = CH > CH ₂ - CH ₂ = CH ₂ = (6) $\frac{h_{3}}{4}$ (7) NaChol simulator, allocon is semiconductor, allower is conductor, quartz is piezo electric compounds in which sizes of cation, and antons are almost equal. (8) Fee O _{0.98} has non stoichiometric metal deficiency defet. (9) Density decreases in case of crystals with Shortky's defet. (1) S-methyl4-cookes-2-en-5-al × (4) Stoict syndrews - 2-en-5-al × (5) Che two neerest harmonics of a tube closed at one- mindig on all or 2-bit from one of 2-bit from one of the compound (1) S-methyl4-cookes-2-en-5-al × (2) Short syndrews - 2-en-5-al × (3) Short syndrews - 2-en-5-al × (4) Stoict syndrews - 2-en-5-al × (5) And the prevention of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cosed at one- mindig on all or 2-bit from one of the cos	133. Which one is the correct order of acidity?	
(c) $CH_3 - CH_3 > CH_2 - CH_2 > CH_3 - C=CH > CH = CH > CH_3 - CH = CH > CH_3 - CH = CH > CH_3 - C$	$CH \equiv CH \geq CH_2 = CH_2 > CH_3 - C \equiv CH >$	(2) $\frac{1_0}{\sqrt{2}}$ (2)
(2) $CH_3 - CH_2 - CH_2 - CH_2 - CH_3 - C = CH - CH_2 - CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3 - C = CH - CH_3 - C = CH_3 - CH_3 -$	CH ₃ -CH ₃	16 2 ld 2
(i) CH_=CH_2 > CH_2 - CH_2 > CH_2 - CH_2 (i) CH_=CH_2 > CH_2 - CH_2 > CH_2 - CH_2 (i) H = CH > CH_2 - C = CH > CH_2 = CH_2 (i) H = CH > CH_2 - C = CH > CH_2 = CH_2 (i) H = CH > CH_2 - C = CH > CH_2 = CH_2 (i) H = CH > CH_2 - C = CH > CH_2 = CH_2 (i) Nacled Tribulator, alicon is semiconductor, aliver is conductor, quartz is piezo alectric crystal. (i) Nacled Tribulator, alicon is semiconductor, aliver is conductor, quartz is piezo alectric crystal. (i) Prenekel defect is favoured in those ionic crompounds in which sizes hol calino, and anions are almost equal. (i) Freq. 9, as non stoichiometric metal dificiency defect. (i) Smethyl 4-oxohex 2-gn-5, al \checkmark (ii) Smethyl 4-oxohex 2-gn-5, al \checkmark (iii) Sinethyl 4-oxohex 2-gn-5, al \checkmark (iiii)	(2) $CH_2 - CH_2 > CH_2 = CH_2 > CH_3 - C \equiv CH >$	In in all million
(i) $CH_{\pm}=CH_{2}>CH_{3}-CE=CH_{3}>CH_{3}-CE=CH_{3}-CE=CH_{3}-CH_{3}-CE=CH_{3}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3}-CH_{3}-CE=CH_{3}-CH_{2}-CH_{3$	CH=CH K	$(3) \frac{-0}{2}$
(a) $Ch_2 = Ch_2 + Ch_3 - Ch_2 - Ch_2 - Ch_3 - Ch_2 = Ch_2 - Ch_3 - Ch_3 - Ch_2 = Ch_2 - Ch_2 - Ch_3 - Ch_3 - Ch_2 = Ch_2 - Ch_2 - Ch_3 - Ch_3 - Ch_3 - Ch_2 = Ch_2 - Ch_2 - Ch_3 - Ch_$		
(a) $CH = CH > CH_2 - CH_2 = CH_2$ $CH_3 - CH_3$ (b) $CH = CH > CH_2 - CH_2 = CH_2$ $CH_3 - CH_3$ (c) $R = CH > CH_2 - CH_2 = CH_2$ (c) $R = CH_2 - CH_2 - CH_2 - CH_2$ (c) $R = CH_2 - CH_2$	$(3) CH_2 = CH_2 > CH_3 - CH = CH_2 > CH_3 - C =$	I_0 I_0
(4) CH = CH > CH_2 - C = CH_2 - CH_2 - CH_2 = CH_2 - CH_2 - CH_2 - CH_2 = CH_2 - CH_2	CH>CH=CH K	(4) 4
134. Which is the incorrect satement? 135. The IUPAC pame of the compound defect. (1) S-methyl 4 cooker 2-en-5-al \times (1) S-methyl 4 cooker 2-en-5-al \times (2) $\frac{1}{2}$ $$	(4) $CH \equiv CH > CH_3 - C \equiv CH > CH_2 = CH_2 >$	
134. Which is the incorrect platement? (1) NaCle) is tribulator, sileon is semiconductor, silver is conductor, quartz is piezo electric crystal. (1) NaCle) is tribulator, sileon is semiconductor, silver is conductor, quartz is piezo electric crystal. (2) Frenkel defect is favoursed in those ionic compounds in which sizes of cation and anions are almost equal. (3) FeO ₁₀₃₀ has non stoichiometric metal deficiency defect. (4) Density decreases in case of crystals with schottky's defect. (1) S-methyl-toxohex-2en-5-al X + (1) - (1)	$CH_3 - CH_3$	138. An arrangement of three parallel straight wires
134. Which is the furcher explanation of the second actor, alter is conductor, quartz is piezo electric crystal. (1) NaCl(s) Simulator, silicon is semiconductor, alter is conductor, quartz is piezo electric crystal. (2) Frenkel defect is favoured in those ionic compounds in which sizes of cation and anions are almost equal. (3) FeO _{0.58} has non stoichiometric metal deficiency defect. (4) Density decreases in case of crystals with Schottky's defect. (5) FeO _{0.58} has non stoichiometric metal deficiency defect. (6) Density decreases in case of crystals with Schottky's defect. (7) S-methyl4-oxohex-2en-5-al × 1 × 1 × 1 × 1 × 1 × 1 × 1 × 1 × 1 ×		placed perpendicular to plane of paper carrying
(1) NAC(6) RINGUARD, glacen is semiconductor, silver is conductor, quartz is piezo electric crystal. (3) FeO _{0.98} has non stoichiometric metal deficiency defect. (4) Density decreases in case of crystals with Schottky's defect. (1) 5-methyl-4 coolnes-2 cm-5 al (1) (1) 5-methyl-4 coolnes-2 cm-5 al (1) (2) 40 Hz (3) 10 Hz (4) 2 Holtz (4) 2 Holtz (5) The two nearest harmonics of a tube closed at one ond and open at thore ond are 220 Hz and 240 Hz. (5) 10 Hz (6) 20 Hz (7) 30 Hz (7) 4 Hz (7) 4 Hz (7) 4 Hz (7) 5 Hz	134. Which is the incorrect statement?	same current 'I' along the same direction is shown
silver is conductor, quartz is prezo electric crystal. Frenkel defect is favoured in those ionic compounds in which sizes of cation, and anions are almost equal. (a) FeO _{0.98} has non stoichiometric metal deficiency defect. (b) FeO _{0.98} has non stoichiometric metal deficiency defect. (c) Peo _{0.98} has non stoichiometric metal deficiency defect. (c) Peo _{0.98} has non stoichiometric metal deficiency defect. (c) Peo _{0.98} has non stoichiometric metal deficiency defect. (c) $\frac{\sqrt{2}\mu_0 i^2}{\pi d}$ (c) $\frac{\sqrt{2}\mu_0 i^2}{\sqrt{2} \pi d}$ (c) $\frac{\sqrt{2}\mu_0 i^2}{\sqrt{2} \pi d}$ (c) $\frac{\mu_0 i^2}{\sqrt{2} \pi d}$ (c) $\mu_0 $	(1) NaCl(s) is insulator, silicon is semiconductor,	in Fig. Magnitude of force per unit length on the
$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array}{c} \end{array}{c} \end{array}{c} \end{array}{c} \end{array}{c} \end{array}{c} \end{array}{c} \end{array}$	silver is conductor, quartz is piezo electric	middle wire 'B' is given by:
(1) S-methyl 4-oxohex-2-en-5-al \times (4) S-formylicex-2-en-5-al \times (5) The two nearest harmonics of a tube closed at one (6) The two nearest harmonics of a tube closed at one (7) Soft \times The full the full the full the system (8) The two nearest harmonics of a tube closed at one (9) The two nearest harmonics of a tube closed at one (1) Somethyl to the system (1) Soft \times The full the full the system (1) Somethyl to the system (1) Somethyl to the system (1) Somethyl to the system (1) Somethyl to the system (1) Soft \times The full to the system (1) Somethyl to the system (1) Somethyl to the system (1) Somethyl to the system (1) Soft \times The full the full the system (1) Soft \times The full the system (2) Soft \times The full the system (3) A RT (4) IS RT (4) IS RT (5) The system (5) Soft \times The full the system (6) Soft \times The full the system (7) Soft \times The full the system (8) Soft \times The full the system (9) Soft \times The full the system (1) Soft \times The full the system (2) Soft \times The full the system (3) Soft \times The full the system (4) IS RT (5) Soft \times The full the system (6) Soft \times The full the system (7) Soft \times The full the system (8) Soft \times The full the system (9) Soft \times The full the system (9) Soft \times The full the system (9) Soft \times Th	crystal.	Bo do of FEILAR
$\begin{array}{c} \begin{array}{c} \begin{array}{c} compounds m winch sizes to random and anota are almost equal. \\ (a) \\ \hline FeO_{0.98} has non stoichiometric metal deficiency defect. \\ \hline (a) \\ \hline Density decreases in case of crystals with schottky's defect. \\ \hline (b) \\ \hline FeO_{0.98} has non stoichiometric metal deficiency defect. \\ \hline (c) \\ \hline \\ $	E (2) Frenkel defect is favoured in those ionic	
(3) FeO _{0.98} has non stoichiometric metal deficiency defect. (4) Density decreases in case of crystals with Schottky's defect. (5) The IUPAC name of the compound $H - S \bigcirc \bigcirc$	compounds in which sizes or cation and	too hum
(a) $\frac{1}{2} \frac{1}{2} $	anions are annost equal.	d (= 1. K. Inta
(4) Density decreases in case of crystals with Schottky's defect. 135. The IUPAC name of the compound $H = \begin{cases} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 &$	(3) FeO _{0.98} has non stoichiometric metal	
(4) Density decreases in case of crystals with Schottky's defect. 135. The IUPAC name of the compound $H - \oint - $	dendency delect.	A () = HTV a
Scholdty statist. 135. The IUPAC name of the compound $H = \begin{cases} -1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	(4) Density decreases in case of crystals with	$\sqrt{2}$ $\frac{1}{2}$
135. The IUPAC name of the compound $H = \begin{cases} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$	Schollky Sutteet.	(1) $\frac{\sqrt{2}\mu_0}{\pi d}$
H \bigcirc	135. The IUPAC name of the compound	"a
H $= \begin{cases} 136 \\ 136 $		μ _o i ² h ^π
H $= \begin{cases} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0$		$\frac{1}{\sqrt{2}\pi d}$
(1) 5-methyl-4-oxohex-2-en-5-al (1) (3) $\frac{\mu_0 i^2}{2\pi d}$ (4) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 5 \cdot \text{enal } (2)$ (5) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (4) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (5) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (4) $\frac{2\mu_0 i^2}{\pi d}$ (5) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (4) $\frac{2\mu_0 i^2}{\pi d}$ (5) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (6) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (7) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (8) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (9) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (1) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (1) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (1) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (1) $\frac{3 \cdot \text{keto} 2 \cdot \text{methylhex} 4 \cdot \text{enal } (2)$ (2) $4 \cdot 0 \cdot \text{Hz}$ (3) $1 \cdot 1 \cdot \text{RT}$ (4) $1 \cdot 5 \cdot \text{RT}$ (5) $4 \cdot 1 \cdot $	H-C-C-G is	word
(1) 5-methyl-4-oxohex-2-en-5-al \checkmark 3-keto-2-methylhex-5-enal α (4) 3-keto-2-methylhex-4-enal \varkappa (4) 5-formylhex-2-en-3-one (136.) The two nearest harmonics of a tube closed at one med and open at other end are 220 Hz and 260 Hz. What is the fundamental frequency of the system (1) 30 Hz (2) 40 Hz (3) 10 Hz \checkmark (4) $\frac{2\mu_0 i^2}{\pi d}$ (5) A gas distance consists of 2 moles (10) and 4 moles of Anat femperature T. Neglecting all vibrational L. \mathscr{U} (1) \mathscr{I} Hz \checkmark (1) \mathscr{I} Hz \checkmark (2) 40 Hz (3) 10 Hz \checkmark (4) \mathscr{I} Hz \checkmark (5) \mathscr{I} Hz \checkmark (6) \mathscr{I} Hz \checkmark (7) \mathscr{I} Hz \checkmark (8) \mathscr{I} HZ \checkmark (9) \mathscr{I} Hz \checkmark (9) \mathscr{I} Hz \checkmark (1) \mathscr{I} Hz \checkmark (2) \mathscr{I} Hz \checkmark (3) 4 RT (4) 15 RT	QG	$\mu_0 i^2$
(1) 5-methyl 4-oxohex-2-em-5-al x 3-keto-2-methylhex-5-enal x (4) $\frac{2\mu_0 i^2}{\pi d}$ (5) $\frac{3-keto-2-methylhex-4-enal \times}{5-formylhex-2-en-3-one}$ (1) $\frac{3-keto-2-methylhex-4-enal \times}{5-formylhex-2-en-3-one}$ (1) $\frac{3-keto-2-methylhex-4-enal \times}{5-formylhex-2-en-3-one}$ (1) $\frac{3-keto-2-methylhex-4-enal \times}{5-formylhex-2-en-3-one}$ (1) $\frac{3-keto-2-methylhex-4-enal \times}{5-formylhex-2-en-3-one}$ (1) $\frac{3-keto-2-methylhex-4-enal \times}{5-formylhex-2-en-3-one}$ (2) $\frac{4-\mu_0 i^2}{\pi d}$ (3) $\frac{1}{30}$ Hz (4) $\frac{2\mu_0 i^2}{\pi d}$ (5) $\frac{1}{30}$ Hz (6) $\frac{4-\mu_0 i^2}{\pi d}$ (7) $\frac{1}{30}$ Hz (1) $\frac{30}{10}$ Hz (2) $\frac{40}{12}$ (3) $\frac{4}{15}$ RT (4) $\frac{1}{30}$ Hz (5) $\frac{4}{10}$ Hz (6) $\frac{1}{30}$ (7) $\frac{1}{30}$ Hz (8) $\frac{1}{30}$ Hz (9) $\frac{1}{30}$ Hz (9) $\frac{1}{30}$ Hz (9) $\frac{1}{30}$ Hz (1) $\frac{1}{30}$ Hz (2) $\frac{1}{30}$ Hz (3) $\frac{4}{15}$ RT	(nr	(3) $\frac{1}{2\pi d}$
$\begin{array}{c} \textbf{Mt} \textbf{M} \textbf{M} \textbf{M} \textbf{M} \textbf{M} \textbf{M} \textbf{M} M$	(1) 5-methyl-4-oxohex-2-en-5-al X	
 (4) 3-keto-2-methylhex-4-enal × (4) 5-formylhex-2-en-3-one (136) The two nearest harmonics of a tube closed at one and and open at other and are 220 Hz and 260 Hz. What is the fundamental frequency of the system? (1) 30 Hz (2) 40 Hz (3) 10 Hz (4) Td (1) 9 RT (1) 9 RT (1) 9 RT (2) 40 Hz (3) 10 Hz (4) Td (5) A gasnizture consists of 2 moles (10) and 4 moles of Ariat temperature T. Neglecting all vibrational 1, 14 (3) 10 Hz (4) Td (5) A gasnizture consists of 2 moles (10) and 4 moles of Ariat temperature T. Neglecting all vibrational 1, 14 (6) (1) 9 RT (1) 9 RT (2) 40 Hz (3) 10 Hz (4) Td (4) 15 RT 	3-keto-2-methylhex-5-enal	$2\mu_0 i^2$
 (4) 5-formylhex-2-en-3-one (136) The two nearest harmonics of a tube closed at one and and open at other and are 220 Hz and 260 Hz. What is the fundamental frequency of the system? (1) 30 Hz (2) 40 Hz (3) 10 Hz (4) 15 RT 	1312 3-keto-2-methylhex-4-enal ×	(4) πd
 (1) The two nearest harmonics of a tube closed at one and and open at other and are 220 Hz and 260 Hz. What is the fundamental frequency of the system? (1) 30 Hz (2) 40 Hz (3) 10 Hz (4) 15 RT 	(4) 5-formy hex-2-cn-3-onc	3(3)
 (136.) The two nearest harmonics of a tube closed at one of An at temperature T. Neglecting all vibrational L. (Control and open at other end are 220 Hz and 260 Hz. What is the fundamental frequency of the system? (1) 30 Hz (2) 40 Hz (3) 10 Hz (4) 15 RT 		139 A vasanistme consists of 2 moles of Oaland 4 moles
(1) 30 Hz (2) 40 Hz (3) 10 Hz 20 Hz 40 Hz 10 10 Hz 10 Hz 10 10 Hz 10 Hz	136. The two nearest harmonics of a tube closed at one	of Anat temperature T. Neglecting all vibrational L 4
What is the fundamental frequency of the system, (1) 30 Hz (2) 40 Hz (3) 10 Hz (4) 15 RT (1) 9 NT (1) 9 NT (1) 9 NT (1) 9 NT (3) 4 RT (4) 15 RT	and and open at other and are 220 Hz and 260 Hz.	utoriug, but istal internal energy of the system is . My
(1) 30 Hz (2) 40 Hz (3) 10 Hz (4) 11 RT (5) 4 RT (6) 4 RT (7) 11 RT (7) 4 RT (8) 4 RT (9) 4 RT (9) 4 RT (1) 10 Hz (1) 10 Hz (1) 10 Hz (2) 10 Hz (3) 4 RT (4) 15 RT	What is the fundamental frequency of the system?	(1) OPT - CPTT
(2) 40 Hz (3) 10 Hz $V = 10$ 10 10 11 RT (3) 4 RT (4) 15 RT	(1) 30 Hz (1)	B
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(2) 40 Hz	11 RT DU
(4) 15 RT	(3) 10 Hz V= 1 40	(3) 4 RT
And And And (4) ISKI	TE 20 Hz AST -	(4) 15 RT
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Z 18 9 159. 156. pherical black body with a radius of 12 cm A rope is wound around a hollow cylinder of mass radiates 450 watt power at 500 K. If the radius were 3 kg and radius 40 cm. What is the angular) halved and the temperature doubled, the power acceleration of the cylinder if the rope is pulled with radiated in watt would be : a force of 30 N? 25 rad/s^2 tox up = 2 1000 (1) 5 m/s^2 (2) 800 (3) 25 m/s^2 (4) 0.25 rad/s^2 225 450 One end of string of length *l* is connected to a particle of mass 'm' and the other end is connected to a small peg on a smooth horizontal table. If the particle moves in circle with speed 'v', the net force on the he photoelectric threshold wavelength of silver is particle (directed towards center) will be 3250×10^{-10} m. The velocity of the electron ejected (T represents the tension in the string) from a silver surface by ultraviolet light of wavelength 2536×10^{-10} m is : $T - \frac{mv^2}{l}$ (Given $h = 4.14 \times 10^{-15}$ eVs and $c = 3 \times$ (2)Zero $\approx 61 \times 10^3 \text{ ms}^{-1}$ (1) Т (3) $\approx 0.3 \times 10^6 \text{ ms}^{-1}$ (2) mv^2 $\approx 6 \times 10^5 \text{ ms}$ Thermodynamic processes are indicated in the following diagram. 0.6×10⁶ 58 A beam of light from a source L is incident normally on a plane mirror fixed at a certain distance x from Othe source. The beam is reflected back as a spot on a 700 K scale placed just above the source D. When the mirror 500 K is rotated through a small angle θ the spot of the 300 K light is found to move through a distance y on the scale. The angle θ is given by : Match the following: Column-2 Column-1 2yP. Process P Adiabatic PRHANE Q lsobaric x Isochoric R. Process III (2)IJ. I'roccoo 1V# d. , Twittiarmal 7 (1) $P \rightarrow c$, $Q \rightarrow d$, $R \rightarrow b$, $S \rightarrow a$ $O \rightarrow b, R \rightarrow a, S \rightarrow c$ (2) $P \rightarrow d$ $\rightarrow a$, $Q \rightarrow c$, $R \rightarrow d$, $S \rightarrow b$ (3) <u>y</u> x (4) $P \rightarrow c$, $Q \rightarrow a, R \rightarrow d, S \rightarrow b$





179. A long solenoid of diameter 0.1 m has 2×10^4 turns A carnot engine having an efficiency of $\frac{1}{10}$ lal 175. as heat per meter. At the centre of the solenoid, a coil of T engine, is used as a refrigerator. If the work lone on 100 turns and radius 0.01 m is placed with its axis the system is 10 J, the amount of energy absorbed coinciding with the solenoid axis. The current in from the reservoir at lower temperature is : the solenoid reduces at a constant rate to 0A from 4 A in 0.05 s. If the resistance of the coil is $10 \pi^2 \Omega$, (1)99 J the total charge flowing through the coil during this 100 T time is : (3)1] (1)32 µ C (4) 90 T (2)16 π µC (3)32 π µC 176. In a common emitter transistor amplifier the audio signal voltage across the collector is 3 V. The (4) 16 µ C resistance of collector is 3 kΩ. If current gain is 100 (1) and the base resistance is $2 k\Omega$, the voltage and Two cars moving in opposite directions approach power gain of the amplifier is : each other with speed of 22 m/s and 16.5 m/s 1004 150 and 15000 respectively. The driver of the first car blows a horn ard having a frequency 400 Hz. The frequency heard (2)20 and 2000 by the driver of the second car is velocity of sound (3) 200 and 1000 340 m/s : (4) 15 and 200 411 Hz 448 Hz 177. Preeti reached the metro station and found that the escalator was not working. She walked up the (3) 350 Hz stationary escalator in time t1. On other days, if she (4) 361 Hz remains stationary on the moving escalator, then the escalator takes her up in time t2. The time taken by her to walk up on the moving escalator will be : ded mal (2)mal (3)ALLA (4)178. A thin prism having refracting angle 10° is made of glass of refractive index 1.42. This prism is combined with another thin prism of glass of refractive index 1.7. This combination produces dispersion without deviation. The refracting angle of second prism should be : 8° (1) 10° (2)

22 Space For Rough Work

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