

Sapthagiri Campus, Kanangi Road, Hirgana, Karkala - 576 117 Ph: +91 96069 06466 Email: info@creativeedu.in

NEET (UG)-2025 (CNMT - 3)

PHYSICS

QUESTION PAPER

1. The displacement of a particle is given as $X = \frac{P}{O}(1 - e^{-Qt})$, where t is time and P and Q are dimensional constant. The dimension of PQ will be

- A) $[M^0LT^{-1}]$
- B) $[M^0LT^{-2}]$
- C) [MLT⁻²]
- D) $[M^0L^{-2}T]$

2. The least count of a stopwatch is 0.2s. The time of 100 oscillations is found to be 50s. The maximum error in the measurement is

- A) 0.4%
- B) 0.2%
- C) 2%
- D) 4%

3. A particle thrown up vertically reaches at half of the maximum height in time $(\sqrt{2}-1)$ s. The speed of projection of the particle is $(g = 10 \text{ m/s}^2)$

- A) $5\sqrt{2}$ m/s
- B) 10 m/s
- C) 40 m/s
- D) $10\sqrt{2}$ m/s

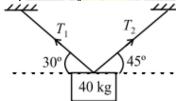
4. Virat Kohli can throw a ball to a maximum horizontal distance of 50 m. How much high above the ground can he throw the same ball?

- A) 25 m
- B) 50 m
- C) 100 m
- D) 75 m

5. If $\vec{A} = 2\hat{i} + 3j$ and $\vec{B} = 3\hat{i} + 3j + 2k$, then the unit vector in the direction of $\vec{A} + \vec{B}$ is

- A) $\frac{5\hat{i}+5j+3k}{\sqrt{59}}$ B) $\frac{5\hat{i}+5j-3k}{\sqrt{59}}$ C) $\frac{5\hat{i}+6j-2k}{\sqrt{65}}$

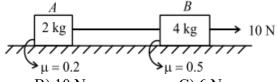
6. A body of a mass 40 kg is suspended by two massless strings as shown in the figure, then



- A) $\sqrt{2}T_1 \sqrt{3}T_2 = 0$ B) $\sqrt{3}T_1 \sqrt{2}T_2 = 0$ C) $\sqrt{3}T_1 + \sqrt{2}T_2 = 0$ D) $3T_1 2T_2 = 0$

7. Two blocks A and B are connected with an ideal string are pulled horizontally by a force of 10 N as

shown in the figure. The force of friction acting on block A is



- A) 4 N
- B) 10 N
- C) 6 N
- D) Zero

8. The work done by an agent applying a force $\vec{F} = (\hat{i} + 2j + 3k)N$ on a particle in moving it from A(0, 0, 0) m to B(3, 4, 5)m is

- A) 26 J
- B) 20 J
- C) 13 J
- D) 39 J

9. Kinetic energy of any moving particle is

- A) Scalar, positive
- C) May be vector, positive

- B) Scalar, may be negative
- D) Vector, may be zero

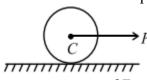


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10. A solid sphere placed on a rough horizontal surface, is pulled horizontally by a force F. If it undergoes pure rolling, then the frictional force developed is



A)
$$\frac{5}{7}F$$

B)
$$\frac{3}{7}F$$

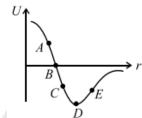
C)
$$\frac{3F}{5}$$

D)
$$\frac{2}{7}F$$

11. The curve between potential energy (U) and distance (r) between atoms of a diatomic molecule

is shown in the figure. If \vec{F}_A , \vec{F}_B , \vec{F}_C , \vec{F}_D and \vec{F}_E are forces of interaction between atoms of

molecules corresponding to points shown on curve, then



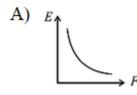
A)
$$|\overrightarrow{F}_B| = 0$$

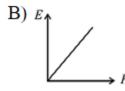
B)
$$|\overrightarrow{F}_A|=0$$

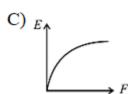
C)
$$\vec{F}_E \cdot \vec{F}_C > 0$$

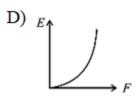
C)
$$\vec{F}_E . \vec{F}_C > 0$$
 D) $\vec{F}_C . \vec{F}_E < 0$

12. Elongation (E) of a steel wire varies with the elongation force (F) according to the graph (within elastic limit)









- 13. Pressure inside the two soap bubbles are 1.01 atm and 1.02 atm. The ratio of their free surface area is
 - A) 2:1
- B) 1:8
- C) 101:102
- D)4:1
- 14. If the temperature of the liquid rises, then its coefficient of viscosity
 - A) Increases decreases periodically
- B) Decreases
- C) Remains same
- D) Increases and
- 15. An anisotropic material has coefficient of linear expansion α , 2α , 2α along x, y and zaxis respectively. Then coefficient of cubical expansion is
- C) 5α
- D) $\frac{5}{2}\alpha$
- 16. In the spectrum of a back body at two temperature T and 2T, let A₁ and A₂ be area under the two curves respectively. The value of $\frac{A_1}{A_2}$ will be

- 17. An ideal diatomic gas undergoes a cyclic process as shown in P –V diagram. The dotted curves are

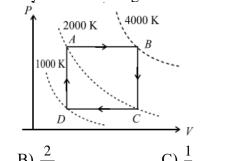


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isothermal. The efficiency of the heat engine based on these processes is



18. The rms speed of an ideal diatomic gas at temperature T is V. When gas dissociates into atoms then its new rms speed becomes double. The temperature at which the gas dissociated into atoms are:

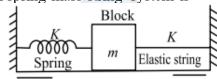
A) T

B) $\sqrt{2}T$

C) $\frac{T}{2}$

D) 2T

19. The time period of a given spring-mass-string system is



C) $\left(\sqrt{2}+1\right)\pi\sqrt{\frac{m}{2K}}$ D) $\left(\sqrt{2}+1\right)\pi\sqrt{\frac{m}{K}}$

20. If graph between fundamental frequency (f) and corresponding tension (T) in a sonometer wire is plotted, then it is best represented by



21. A tuning fork is kept between two organ pipes A and B. organ pipe A is closed at one end and is of length 18 cm while organ pipe B is opened at both ends as shown in the figure. If fourth over -tone of pipe B and first overtone of pipe A are in resonance with tuning fork, then the length of open organ pipe B is

A) 60 cm

B) 50 cm

C) 40 cm

D) 30 cm

22. An infinite number of charges, each of charge 1 μC are placed on x-axis with co-ordinates $X(m) = 1, 2, 4, 8, \dots \infty$. If a charge 2C is placed at origin, then the net force on 2C charge

A) 18000 N

B) 24000 N

C) 48000 N

D) 72000 N

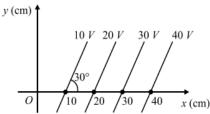
23. The figure shows some of the equipotential surfaces. The magnitude and direction of the electric field given by



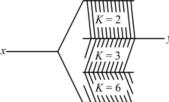
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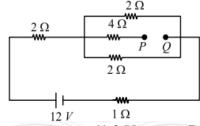
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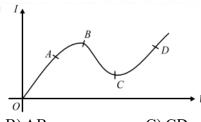
- A) 200 V/m, $-60^{\circ} \text{ with } + \text{ x-axis}$
- B) 200 V/m, $120^{\circ} \text{ with } + \text{x-axis}$
- C) 100 V/m, $30^{\circ} \text{ with } + \text{ x-axis}$
- D) 100 V/m, $120^{\circ} \text{ with } + \text{x-axis}$
- 24. In the given arrangement of parallel plates. Each plate has area A and distance between two consecutive plates is d. The equivalent capacitance of the system between x and y is given as



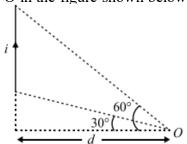
- A) $\frac{\varepsilon_0 A}{d}$
- B) $\frac{2\varepsilon_0 A}{d}$
- C) $\frac{3\varepsilon_0 A}{d}$
- D) $\frac{4\varepsilon_0 A}{d}$
- 25. The potential difference between points P and Q in the given circuit is



- A) 2 V
- B) 1 V
- C) 3 V
- D) 4 V
- 26. The V –I characteristics of a non-linear device is shown in the figure. The region showing negative resistance is



- A) OA
- B) AB
- C) CD
- D) BC
- 27. The magnetic field at point O in the figure shown below is





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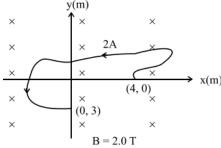
A)
$$\frac{\mu_0 i}{4\pi d} \left[\sqrt{3} - 1 \right]$$
 B) $\frac{\mu_0 i}{8\pi d}$

B)
$$\frac{\mu_0 i}{8\pi d}$$

C)
$$\frac{\mu_0 i}{8\pi d} \left(\sqrt{3} - 1\right)$$

28. The ratio of magnetic length to geometrical length of a bar magnet is about

29. The end points of a current-carrying wire lie on the x-axis and y-axis as shown in the figure. The magnetic force on the wire is



A) 10 N

B) 20 N

C) 30 N

D) Zero

30. Consider the following statements

(a) Eddy current loss is minimized by using laminated cores

(b) Self-inductance is called inertia of electricity.

Choose the correct statements.

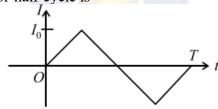
A) Only a

B) Only b

C) Both a and b

D) Neither a nor b

31. The variation of an alternating current (I) varies with time (t) as shown in the figure. The average value of current for half cycle is



A) Zero

D) $\frac{l_0}{\pi}$

32. Which one of the following rays (or wave) has maximum speed in air?

A) β-rays

B) α-rays

C) Sound wave

D) Heat radiations

33. In compound microscope, intermediate image formed is

A) Virtual, erect and magnified

B) Real, erect and diminished

C) Real, inverted and magnified

D) Virtual, erect and diminished

34. A convex mirror is dipped in a liquid whose refractive index is equal to the refractive index of material of mirror. Then its focal length will

A) Become zero

B) Become infinite

C) Remain unchanged

D) Become small but not zero

35. In the double-slit experiment, what should be the width of each slit to obtain 8 maxima of the double

slit pattern within the central maxima of single slit pattern with d = 3 mm?

A) 0.6 mm

B) 0.4 mm

C) 0.75 mm

D) 0.3 mm

36. The work function of a photosensitive surface is 3.2 eV. The wavelength of the incident radiation for which the stopping potential is 3V lies in the



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A) Visible region	B) IR region	C) UV region	D) Radio wave
region			

37. 1 mg mass is equivalent to

A)
$$5.66 \times 10^{29} \text{ eV}$$
 B) $4.2 \times 10^{26} \text{ eV}$ C) $9 \times 10^{10} \text{ eV}$ D) $5.66 \times 10^{26} \text{ eV}$

38. The ratio of longest wavelengths corresponding to Lyman and Balmer series in hydrogen spectrum is

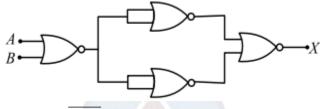
A)
$$\frac{5}{36}$$
 B) $\frac{5}{27}$ C) $\frac{5}{9}$ D) $\frac{3}{4}$

39. If a small amount of a trivalent atom is doped with silicon crystal, then

A) Its resistance is increased B) It becomes n-type semiconductor

C) Semiconductor becomes electrically positive D) There will be holes in

40. The output (X) of the logic circuit shown in the figure will be



B) $\overline{A+B}$ A) A.B C) A.B D)A + B

41. Assertion: In a simple battery circuit, the point of the lowest potential is positive terminal of the battery.

Reason: The current flows towards the point of the higher potential, as it does in such a circuit from the negative to the positive terminal.

A) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

C) If the Assertion is correct but Reason is incorrect.

D) If both the Assertion and Reason are incorrect.

42. Assertion: In electric circuits, wires carrying currents in opposite directions are often twisted together.

Reason: If the wires are not twisted together, the combination of the wires forms a current loop, the magnetic field generated by the loop might affect adjacent circuits or components.

A) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.

C) If the Assertion is correct but Reason is incorrect.

D) If both the Assertion and Reason are incorrect.

43. Assertion: Eddy currents are produced in any metallic conductor when magnetic flux is changed

around it.

Reason: Electric potential determines the flow of charge.



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- A) If both Assertion and Reason are correct and the Reason is a correct explanation of
- B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
- C) If the Assertion is correct but Reason is incorrect.
- D) If both the Assertion and Reason are incorrect.
- 44. Assertion: Choke coil is preferred over a resistor to control the current in an AC circuit. Reason: Power factor of an ideal inductor is zero.
 - A) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
 - B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
 - C) If the Assertion is correct but Reason is incorrect.
 - D) If both the Assertion and Reason are incorrect.
- 45. Assertion: The image of an extended object placed perpendicular to the principal axis of a mirror, will be erect if the object is real but the image is virtual.

Reason: The image of an extended object, placed perpendicular to the principal axis of a mirror, will

be erect if the object is virtual but the image is real.

- A) If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
- B) If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
- C) If the Assertion is correct but Reason is incorrect.
- D) If both the Assertion and Reason are incorrect.

CHEMISTRY

	7.1-1		
46. 917.65 is rounded o	ff to give answer in four	r significant figures as	;
A) 917.6	B) 917.7	C) 917.65	D) 9.176×10^{1}
47. The number of gram	n atoms of oxygen in 6.0	$02 \times 10^{24} \text{ CO}$	
A) 1	B) 0.5	C) 5	D) 10
48. A near UV photon of	of 300 nm is absorbed by	y a gas and then re-em	itted as two photons.
One photon is red w	ith the wavelength 760	nm. Hence, waveleng	th of the second photon
is			
A) 460 nm	B) 1060 nm	C) 496 nm	D) 300 nm
49. For the electrons of	oxygen atom, which of	the following stateme	nts is correct?
A) Z _{eff} for an ele	ectron in a 2s-orbital is t	the same as Z _{eff} for an	electron in a 2p-orbital

- - B) An electron in the 2s-orbital has the same energy as an electron in the 2p-orbital
 - C) Z_{eff} for an electron in 1s-orbital is the same as Z_{eff} for an electron in a 2s-orbital
 - D) The two electrons present in the 2s-orbital have spin quantum numbers m_s but of opposite sign
- 50. Which of the following sequence of arrangement is not in agreement with periodic property written against it?
 - A) B < Al < Ga < In (atomic radius) B) C < N < O < F (electronegativity)



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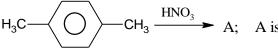
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	C) Li < Be < B < C character)	(ionisation enthalpy)	D) Be \leq Mg \leq Ca \leq	Sr (metallic
51.	Considering the elemen	its F, Cl, O and N, the	correct order of their ch	emical reactivity in
	terms of oxidising prop	erty is		•
	A) $F > C1 > O > N$	B) $F > O > C1 > N$	C) $C1 > F > O > N$	D) $O > F > N > C1$
52.	Which of the following	molecules or ions is n	ot linear?	
	A) BeCl ₂	B) ICl ₂	$C) CS_2$	D) ICl ₂ ⁺
53.	Molecular shapes of SF	F ₄ , CF ₄ and XeF ₄ are		-
	-	, 0 and 1 lone pair of e	lectrons respectively	
		, 1 and 1 lone pair of e		
		1 and 2 lone pairs of e		
		0 and 2 lone pairs of e		
54.	Consider the following		1 7	
	A. Tetracyanometha		ioxide C. Benzer	ne D. 1, 3-
	buta-di-ene			
	Ratio of σ and π -bo	nds are in order		
	A) A = B < C < D	B) A = B < D < C	C) A = B = D = C	D) C < D < A < B
55.	A gas placed in a cylind			
	external pressure of 1 a	tm from a volume of 5	L to 10 L by absorbing	3 400 J heat. The
	change in internal energ	gy is		
	A) 88.76 J	B) -102.22 J	C) -106.35 J	D) –122.22 J
56.	Sign of ΔG is positive a	-		
	A) ΔH is positive at		B) ΔH is negative as	_
	C) ΔH is negative a	-	D) ΔH is negative as	
57.	Sulphide ion (S ²⁻) react	ts with solid su <mark>lphu</mark> r f <mark>o</mark>	rming S_2^{2-} and S_3^{2-} with	formation constant
	12 and 132. Formation	constant of S_3^{2-} from si	ulphur and S_2^{2-} is	
	A) 12	B) 132	C) 132 × 12	D) 11
58.	Oxidation number of C			,
	Ca			
	O.CI**			
	A) zero in each		B) -1 in Cl* and $+1$	in Cl**
	C) $+1$ in Cl* and -1	l in Cl**	D) 1 in each	
59	A compound contains a	otoms of three elements	A R and C. If the oxid	lation number of A is

- +2, B is +5 and that of C is -2, the possible formula of the compound is
 - A) $A_2(BC_3)_2$
- B) $A_3(BC_4)_2$
- C) $A_3(B_4C)_2$
- 60. The number of primary, secondary, tertiary and quaternary carbons in neo-pentane are respectively,
 - A) 4,3,2 and 1
- B) 5,0,0 and 1
- C) 4,0,0 and 1
- D) 4,0,1 and 1

61. Consider the following reaction



Choose the correct option



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A)
$$H_3C$$
 \longrightarrow CH_3 B) $HOOC$ \longrightarrow CH_3 C) $HOOC$ \longrightarrow $COOH$ D) None of these

- 62. Electrophilic addition reactions proceed in two steps. The first step involves the addition of an electrophile. Name the type of intermediate formed in the first step of the following addition reaction. $H_3C - HC = CH_2 + H^+ \longrightarrow ?$
 - A) 2° carbanion
- B) 1° carbanion
- C) 2° carbanion
- D) 1° carbanion
- 63. Addition of HCl to 3, 3-dimethyl but-1-ene yields two products, one of which has a rearranged carbon skeleton. Which of the following cations are intermediate in that reaction?

$$(CH_3)_3 \overset{\oplus}{C}CHCH_2CI, \qquad (CH_3)_3 \overset{\oplus}{C}CHCH_3 \\ II \qquad \qquad II \\ (CH_3)_2 \overset{\oplus}{C}(CH_3)_2, \qquad (CH_3)_2 \overset{\oplus}{C}CH(CH_3)_2 \\ CI \qquad \qquad IV$$

- A) Both I and II
- B) Both I and III
- C) Both II and III
- D) Both II and IV
- 64. Basic strength of $CH \equiv C(I)$; $CH_2 = CH(II)$ and $CH_3CH_2(III)$ will be in order
 - A)I < II < III
- B) II < III < I
- C) III < II < I
- D) III < I < II
- 65. Acidic nature of CH₃OH(I), CH₃SH(II) and CH₃NH₂(III) is in order
 - A) III < II < I
- B) III < I < II
- C) I < II < III
- D) II < I < III
- 66. Which of the following liquid pairs shows a positive deviation from Raoult's law?
 - A) water-hydrochloric acid
- B) benzene methanol
- C) water-nitric acid
- D) acetone-chloroform
- 67. A solution of urea (mol mass 56 g mol⁻¹) boils at 100.18°C at the atmospheric pressure. If K_f and K_b for water are 1.86 and 0.512 K kg mol⁻¹ respectively, the above solution will freeze at
 - A) -6.54 °C
- B) -0.654°C
- C) 6.54°C
- D) 0.654°C
- 68. The conductance of 0.1 M HCl solution is greater than that of 0.1 M NaCl. This is because
 - A) HCl is more ionized than NaCl
 - B) HCl is an acid whereas NaCl solution is neutral
 - C) H⁺ ions have greater mobility than Na⁺ ions
 - D) Interionic forces in HCl are weaker than those in NaCl.
- 69. The emf of the cell Tl | Tl⁺ (0.001 M) || Cu^{2+} (0.01 M) | Cu is 0.83 V. The emf of this cell could be increased by
 - A) increasing the concentration of Tl⁺ ions B) increasing the concentration of Cu²⁺
 - C) increasing the concentration of both
- D) none of the above





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70. In which of the following A) $k = 10^2$	cases, does the reaction B) $k = 10^{-2}$		etion? D) k = 1
71. Which of the following re	epresents the expression	n for 3/4th life of a firs	st order reaction
A) $\frac{k}{2.303} \log 4/3$	$B) \frac{2.303}{k} \log 3/4$	$C) \frac{2.303}{k} \log 4$	D) $\frac{2.303}{k} \log 3$
72. In the P^{3-} , S^{2-} and Cl^{-} ion A) $Cl^{-} < S^{2-} < P^{3-}$	ns the increasing order B) $P^{3-} < S^{2-} < C1^-$		D) $S^{2-} < P^{3-} < C1^{-}$
73. Which of the following c A) H ₂ O	ompounds is the strong B) H_2S	gest reducing agent? C) H ₂ Se	D) H ₂ Te
74. The electronegativity foll	ows the order	,	
A) F > O > Cl > Br Br	B) F > C1 > Br > O	C) O > F > C1 > Br	D) $C1 > F > O >$
75. Which of the following tr			
A) Cr	B) Mo	C) W	D) Hg
76. When acidified solution of	of K ₂ Cr ₂ O ₇ is shaken w	vith aqueous solution o	f FeSO ₄ , then
A) $Cr_2O_7^{2-}$ ion is reduce	ced to Cr ³⁺ ions	B) $Cr_2O_7^{2-}$ ion is conv	erted to CrO_4^{2-} ions
C) $Cr_2O_7^{2-}$ ion is oxidi	ised to Cr	D) $Cr_2O_7^{2-}$ ion is oxid	ised to CrO ₃
77. If the lanthanoid element $-x$)f electrons will have		pink colour, then the	lanthanoid with (14
A) Blue 78. The share of the complex	B) Red	C) Green	D) Pink
78. The shape of the complex A) Square planar	_ `	C) Octahedral	D) None of these
79. The complex ions [Fe(CN			
A) Are both octahedra B) Are both octahedra			
· · · · · · · · · · · · · · · · · · ·	re but opposite magnet	ic character	
· · · · · · · · · · · · · · · · · · ·	ictures but same magne		
80. Brown ring test for nitrate	es is due to the formation	on of	
	B) $[Fe(H_2O)_6]^{2+}$		
81. The IUPAC name of a second of the Paris	condary optically active	e alkyl halide having n	nolecular formula,
$C_5H_{11}Br$ is	B) 3-bromopentane	C) 2-bromonentane	D) 1-bromo-2-
methylbutane	b) 3-biomopentane	C) 2-bromopentane	D) 1-0101110-2-
82. When silver propanoate i	s treated with I ₂ , in CC	Cl4, the major product f	formed is
A) Iodoethane 1-Iodoethane		te C) Ethyl propa	
83. Identify 'Z' in the following	ing sequence of reactio	ns	
$C_3H_7I \xrightarrow{KOH alc.} X$	$\xrightarrow{\text{NBS, hv}} Y \xrightarrow{\text{KCN aq}}$	> Z	
A) $(CH_3)_2CH-CN$		B) Br - CH = CH - C	
C) $CH_2 = CH - CH_2C$		D) $CH_2 = CH - CHB$	
84. For which one of the following a find a form tost?	owing pairs of compou	nds can the members b	be distinguished by
means of iodoform test? A) CH ₃ OH and CH ₃ O	CH ₂ CH ₂ OH	B) CH ₃ CH ₂ OH and O	CH ₃ CHOHCH ₃



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C) CH ₃ CH ₂ CH ₂ OH and CH ₃ CHOHCH ₃	D) C ₆ H ₅ CH ₂ OH and	1 CH ₃ OH
85. Phenol is less acidic than		
A) ethanol	B) methanol	
C) o-nitrophenol	D) p-methylphenol.	
86. The products (A) and (B) in the following react	= -	
$PhCH = CH_{2} \xrightarrow{\text{(i) } Br_{2}/CCl_{4}} (A) \xrightarrow{\text{Dil.H}_{2}c} (A)$ HgSC	$\stackrel{\text{SO}_4}{{}_{}_{}}$ \rightarrow (B)	
A) PhCH ₂ CHO, PhCH ₂ CH ₂ OH	B) $PhC \equiv CNa, PhC$	OCH ₃
C) PhC \equiv CH, PhCH ₂ CHO	- /	
87. The correct order of reactivity of $\rangle C = O$ group	in the following comp	oounds is:
A) $CH_3CHO > (CH_3)_2CO > C_2H_5COCH_3$	B) $C_2H_5COCH_3 > (C_1)$	CH ₃) ₂ CO>CH ₃ CHO
C) $(CH_3)_2CO > CH_3CHO > C_2H_5COCH_3$	D) $(CH_3)_2CO > C_2H$	5COCH3>CH3CHO
88. What is the end product in the following sequen	nce of reactions?	
$C_6H_6 \xrightarrow{HNO_3-H_2SO_4} A \xrightarrow{Sn/HCl} B$		
5 55 K	C) Danganituila	D) Dhowyl
A) Nitrobenzene B) Aniline carbylamine	C) Benzonitrile	D) Flielly!
89. Acetamide and ethylamine can be distinguished	by reacting with	
		ad boot
A) Aqueous HCl and heat	B) Aqueous NaOH a	ind neat
C) Acidified KMnO ₄	D) Bromine water.	
90. Which of the following is not a pyrimidine?	G) C-4i	D) Th
A) Uracil B) Guanine	C) Cytosine	D) Thymine
ВОТ	ANY	
91. House fly belongs to the order		
A) Diptera B) Carnivora	C) Primata	D) Insecta
92. Study the four statements (A-D) given below ar	nd select the two corre	ct ones out of them.
A. Definition of biological species was give	n by Ernst Mayr	
B. Photoperiod does not affect reproduction	in plants.	
C. Binomial nomenclature system was given	n by R.H.Whittaker	
D. In unicellular organism, reproduction is s	synonymous with grov	vth
The correct statements are		
A) C and D B) A and B	C) A and D	D) B and C
93. Specialized cells called heterocyst are present in	1	
A) Dinoflagellates B) Chrysophytes	C) Archaebacteria	D) Cyanobacteria
94. Select the incorrect statement.		
A) Bacterial cell wall is made up of peptido	glycan	
B) Pili and Fimbriae are mainly involved in	motility of bacterial c	ell

C) Cyanobacteria lack of flagellated cells



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- D) Mycoplasma is a wall less microorganism
- 95. Choose the correct statements about Liverworts.
 - I. In liverworts, sexual reproduction occurs by fusion antherozoid and egg, which are produced in antheridium and archegonium respectively.
 - II. Both male and female sex organs may be present on same thallus or different thalli
 - III. Zygote gives rise to sporophyte, which is differentiated into foot, seta and capsule.
 - IV. Some cells of capsule undergo meiosis and give rise to haploid spores.
 - A) I, II and III
- B) II, III and IV
- C) I, III and IV
- D) I, II, III and IV

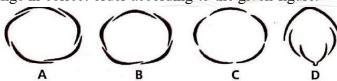
96. Match the following columns.

	Column I		Column II
A.	Red algae	1.	Marchantia
B.	Liverwort	2.	Pinus
C.	Fern	3.	Polysiphonia
D.	Gymnosperm	4.	Adiantum

Codes

	A	В	C	D
A)	1	2	4	3
B)		4	3	1
C)	2	3	1	4
D)	3	1	4	2

97. Arrange in correct order according to the given figure.



- A) A-Imbricate, B-Valvate, C-Twisted, D-Vexillary
- B) A-Twisted, B-Imbricate, C-valvate, D-vexillary
- C) A-Valvate, B-Imbricate, C-Twisted, D-Vexillary
- D) A-Vexillary, B-Twisted, C-Imbricate, D-Valvate
- 98. In which plant the leaf base is swollen?
 - A) Monocots

B) Leguminous

C) All dicots

- D) All angiosperms
- 99. Match the types of vascular bundles with their description.

	List I		List II
A)	Open vascular	1)	Found in dicotyledonous stem, contain cambium between
	bundles		xylem and phloem, and have the ability to form secondary
			tissue



HASSAN



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B)	Closed	2)	Do not have cambium, hence do not form secondary tissue,	
	vascular		commonly found in monocotyledons	
	bundles			
C)	Radial	3)	Xylem and phloem are arranged in different radii, typically	
	vascular		found in roots	
	bundles			
D)	Conjoint	4)	Xylem and phloem are situated at the same radius, with	
	vascular		phloem usually located on the outer side of xylem, common	
	bundles		in leaves and stem	

	Α	В	C	Γ
A)	1	2	3	4
B)	2	1	3	4
C)	4	3	2	1
D)	1	4	2	3

Assertion: Parenchyma cells are found in almost all the parts of the plant and play a 100. role in storage, photosynthesis etc in plants.

Reason: Parenchyma cells have thick cell walls that provide structural support to plants.

- A) Both the assertion and the reason are true and the reason is a correct explanation of the assertion
- B) Both the assertion and reason are true but the reason is not a correct explanation of the assertion
- C) The assertion is true but the reason is false
- D) The assertion is false but the reason is true
- 101. Find out the incorrect statement from the following.
 - A) The mitochondria are the power house of the cell because they generate ATP through cellular respiration.
 - B) Ribosomes are responsible for the synthesis of lipids in the cell.
 - C) The cell membrane is composed mainly of phospholipid bilayer, which regulates the entry and exit of substances.
 - D) Chloroplast in plant cell contains chlorophyll, which capture light energy for photosynthesis.

102.	The	structure	inside	the	chloroplasts	that	contain	stack	s of	f membrane	bound	sacs	is
cal	led _	these	e stacks	s are	known as _								
		E1 1 1 1 1					D) C:		.1				

A) Thylakoid, grana

B) Stroma, thylakoid

C) Grana, stroma

- D) Ribosomes and thylakoid
- Statement I: Mitosis results in the production of four genetically identical cells. 103. Statement II: Meiosis results in the production of four genetically identical cells.
 - A) Both statement I and II are correct.
 - B) Only statement I is correct.







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\mathbf{C}	Only	statement	II	is	correct.
--------------	------	-----------	----	----	----------

- D) Both the statement I and II are incorrect.
- 104. Which one of the following statements is true regarding the Go phase?
 - A) The Go phase is the stage where the cells are actively dividing.
 - B) Cells in the Go phase are metabolically inactive and do not divide.
 - C) Go phase can be permanent or reversible, depending on the cell type and conditions.
 - D) In the Go phase, cells are actively replicating their DNA.
- 105. Match the following with Column I and column II and choose the correct option.

	Column I		Column II
A.	Complex III	i	Succinate dehydrogenase
B.	Complex I	ii	NADH Dehydrogenase
C.	Complex IV	iii	Cytochrome bc1
D.	Complex II	iv	Cytochrome c oxidase

A.	Complex III	i	Succinate dehydrogenase
B.	Complex I	ii	NADH Dehydrogenase
C.	Complex IV	iii	Cytochrome bc1
D.	Complex II	iv	Cytochrome c oxidase
A)	A-iv B-ii C-i	D-iii	B) A-ii B-i C-iv D-iii

C) A-III	D-II	C-1V	D-1	D) A-I	v 0-111	C-II

- What is the correct ratio of ATP utilization in steps of the Calvin cycle?
- A) Reduction: Regeneration \rightarrow 1:1 B) Reduction: Regeneration $\rightarrow 2:1$ C) Reduction: Regeneration $\rightarrow 2:2$ D) Reduction: Regeneration $\rightarrow 1:2$
- performed an elegant experiment with an B plant to show that in 107. bright sun light, small bubble, were formed around the C parts, while in dark they

do not.

106.

В C Α

- A) Ingenhousz Aquatic Green
- B) Ingenhousz **Terrestrial** Green C) Priestly Aquatic Green
- D) Priestly Aquatic Non-green
- 108. Which of the following relations shows substrate level phosphorylation?
 - A) Citric acid \rightarrow α -ketoglutaric acid
- B) Malic acid → oxaloacetic acid

D-i

- C) α -ketoglutaric acid \rightarrow Succinyl-CoA
- D) Succinyl-CoA → Succinic acid
- Assertion: 2, 4 D is selective weedicide 109.

Reason: 2, 4 D is widely used to kill dicotyledonous weeds and doesn't affect mature monocotyledonous plant

- A) Both the assertion and the reason are true and the reason is a correct explanation of
- B) Both the assertion and reason are true but the reason is not a correct explanation of the assertion.
- C) Assertion is true but the reason is false.
- D) Both the assertion and reason are false.
- 110. Match the following
 - (A) IAA

(i) Herring sperm DNA





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(B) ABA

- (ii) Bolting
- (C) Ethylene
- (iii) Stomatal closure

(D) GA

- (iv) Weed-free lawns
- (E) Cytokinins
- (v) Ripening of fruits
- A) (A) (iv), (B) (iii), (C) (v), (D) (ii), (E) (i)

- B) (A) (v), (B) (iii), (C) (iv), (D) (ii), (E) (i)
- (C)(A) (iv), (B) (i), (C) (v), (D) (iii), (E) (ii)
- D) (A) (v), (B) (iii), (C) (ii), (D) (i), (E) (iv)
- Identify the ploidy of the following parts of flowering plants. Ovary, Anther, Egg, Pollen, Male gamete and Zygote
 - A) 2n, 2n, n, n, n, 2n
- B) 2n, 3n, n, n, 2n, 2n
- C) 2n, n, n, n, n, 2n
- D) 2n, 2n,

- n, 2n, n, 2n
- 112. How many microsporangia are there in each lobe of anther?
 - A) One microsporangia
 - C) Three microsporangia

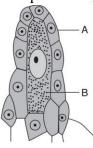
B) Two microsporangia D) Four microsporangia

- Match the following
 - Column I
- A. Vegetative cell
- B. Generative cell
- C. Exine

113.

- D. Intine
- A) A:1, B:2, C:3, D:4
- C) A:3, B:2, C:1, D:4

- Column II
- 1. Sporopollenin
- 2. Spindle-shaped cell
- 3. Large sized and has abundant food reserve
- 4. Cellulose and pectin
- B) A:4, B:3, C:2, D:1
- D) A:2, B:1, C:4, D:3
- 114. Identify the parts A and B in this figure.



- A) A: Megaspore tetrad, B: Nucleus
- B) A: Central cell, B: Megaspore dyad
- C) A: Nucellus, B: Megaspore mother cell
- D) A: Nucellus, B: Central cell
- 115. Taylor and his colleagues used which plant to detect the distribution of newly synthesized DNA?
 - A) Pisum sativum
- B) Mirabilis jalapa C) Vicia faba
- D) Triticum

- aestivum
- β-galactosidase is synthesized by E. coli to catalyse hydrolysis of into 116. and glucose.
 - A) Galactose, lactose

B) Galactose, glucose



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	C) I	actose, galactose		D)	Maltose, ga	alactose	
117.	Assertion: Both the strands of DNA are not copied during the process of transcription.						
Re	ason:	The two molecules of	of RNA complex	mentary	to each oth	er form the double strand	ded
Rì	VA ar	d this would prevent	RNA from bei	ng trans	lated into pa	rotein.	
	A) I	Both the assertion and	d the reason are	true and	d the reason	is a correct explanation	n of
	the assertion.						
	B) Both the assertion and reason are true but the reason is not a correct explanation of						
	the a	assertion.					
	C)A	Assertion is true but the	he reason is fals	se.			
	D) I	Both the assertion and	l reason are fals	se.			
118.	The	coding sequences of	DNA are know	/n as	and the	e intervening sequences	are
kn	own a	as respectively	•				
	A) I	Exon, intron		B)	Intron, exo	n	
	C) (Cistron, exon		D)	Exon, cistre	on	
119.		O can be defined as					
	A)A	amount of CO2 consu	med if all the in	norganic	matter in o	one litre of water is oxidi	zed
	by t	pacteria. B) Amount	of O2 consume	ed if all	the organic	matter in one decilitre	of
	wate	er is reduced by bact	eria. C) Amo <mark>ur</mark>	nt of O2	consumed	if all the organic matter	r in
		litre of water is oxidi	-				
	D) A	amount of O2 consur	ned if all <mark>the in</mark>	organic	matter in o	ne litre of water is oxidi	zed
	by b	acteria.					
120.	Whi	ch one of the following	ng is a w <mark>rong</mark> m	natching	of a microb	e and its industrial production	uct,
wł	nile th	e remaining three are	e correct?				
	A)`	Yeast – statins		,		er aceti – acetic acid	
		Clostridium butylicur				s niger – citric acid	
121.	Mat	ch the following list	of microbes and	d their in	JUIDKI IKI		
	(a)	Saccharomyces cer	revisiae	(i)	Producti	on of immunosuppressiv	ve agents
	(b)	Monascus purpurei		(ii)		of Swiss cheese	
	(c)	Trichoderma polysp	orum	(iii)) Comme	rcial production of ethan	ıol
	(d)	Propionibacterium	sharmanii	(iv)) Producti	on of blood-cholesterol	lowering agen
	((a) (b)	(c))	(d)		
	A) (iv) (i)	(iii	i)	(ii)		
	B) (iii) (iv	(i)		(ii)		
	C) (ii) (i)	(iv	['])	(iii)		
	D) (,	<i>'</i>	•	(iv)		
122.	Whi	ch of the following i	s true about pre	edators?			

- A) They keep the prey population under control.
- B) They may help in maintaining species diversity in a community by reducing the intensity of competition among competing prey species.
- C) They are prudent in nature.



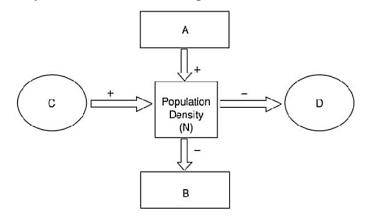


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- D) All the above
- 123. Identify A, B, C and D in this figure.



- A) A: Immigration (I), B: Emigration (E), C: Natality (B), D: Mortality (D)
- B) A: Natality (B), B: immigration (I), C: Mortality (D), D: Emigration (E)
- C) A: Mortality (D), B: Emigration (E), C: Natality (B), D: Immigration (I)
- D) A: Mortality (D), B: Natality (B), C: Emigration (E), D: Immigration (I)
- Connell's elegant field experiments showed that on rocky sea coasts of Scotland, the larger and competitively superior barnacle dominates the intertidal area and exclude smaller barnacle from that zone
 - A) Chathamalus, Balanus
- B) Chathamalus, Chathamalus
- C) Balanus, Balanus
- D) Balanus, Chathamalus
- Which of the following are limitations of ecological pyramids? 125.
 - A) It does not take into account the same species belonging to two or more trophic levels.
 - B) It assumes a simple food chain that almost does not exist in nature.
 - C) Saprophytes are not given at any place.
 - D) All the above
- 126. Find out the correct statement:
 - A) Trophic level represents a functional level, not a species as such.
 - B) A given species never occupies more than one trophic level in the same ecosystem at the same time.
 - C) In most of the ecosystems, producers are less in number and biomass than the herbivores.
 - D) Pyramid of energy can never be upright.
- Match the columns: 127.

Column-I

Column-II

1. Fragmentation

A. Break down of detritus into smaller particles

2. Leaching

B. Precipitation of water-soluble nutrients as unavailable

salt





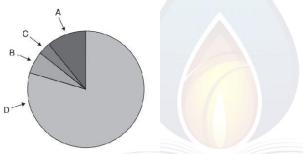


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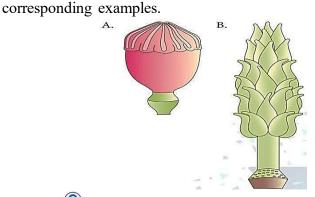
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- 3. Catabolism C. Degradation of detritus by bacterial and fungal enzymes
- B) 1-C, 2-B, 3-A A) 1-A, 2-B, 3-C C) 1-B, 2-C, 3-AD) 1-C, 2-A, 3-B
- 128. In which of the following both pairs have the correct combination?
 - A) In situ conservation: National park Ex situ conservation: Botanical Garden
 - B) In situ conservation: Cryopreservation Ex situ conservation: Wildlife Sanctuary
 - C) In situ conservation: Seed Bank Ex situ conservation: National park
 - D) In situ conservation: Tissue culture Ex situ conservation: Sacred groves
- 129. The species confined to a particular region and not found elsewhere is termed
 - A) Alien B) Endemic C) Rare D) Keystone
- Given below is the representation of the extent of global diversity of invertebrates. What 130. groups the four portions (A to D) represent respectively?



- A) A: Insects, B: Crustaceans, C: Other animal groups, D: Molluscs
- B) A: Crustaceans, B: Insects, C: Molluscs, D: Other animal groups
- C) A: Molluscs, B: Other animal groups, C: Crustaceans, D: Insects
- D) A: Insects, B: Molluscs, C: Crustaceans, D: Other animal groups
- 131. Casparian strips are made up of and found as depositions in the .
 - A) Cutin; epidermis B) Lignin; hypodermis
 - C) Pectin; exodermis D) Suberin; endodermis
- 132. Observe the diagrams and identify the correct option that represents the condition and





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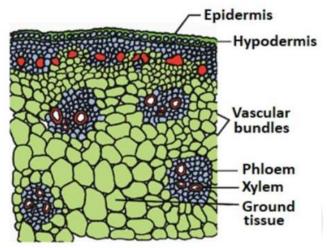
- A) A Syncarpous *Papaver* and B Apocarpous *Michelia*
- B) A Apocarpous *Michelia* and B Syncarpous *Papaver*
- C) A Hypogynous Sunflower and B Epigynous China rose
- D) A Perigynous Datura and B Hypogynous Peach
- 133. The floral formula is $\bigoplus OK_{2+2}C_4A_{2+4}\underline{G}_{(2)}$ for family:
 - A) Brassicaceae

B) Solanaceae

C) Malvaceae

D) Anacardiaceae

134. The given transverse section is of



A) Monocot root

B) Monocot stem

C) Dicot stem

- D) Dicot root
- Specialized epidermal cells surrounding the guard cells are called? 135.
 - A) bulliform cells

B) lenticels

- C) subsidiary cells EDUCATION FOUNDATION MOODELD) complementary cells

ZOOLOGY

136. Assertion: Sponges exhibit "cellular level" of body organisation.

Reason: There is some division of labour(activities) occur among the cells

- A) Both A and R are correct but R is not the correct explanation of A
- B) A is correct but R is not correct
- C) R is correct but A is not correct
- D) Both A and R are correct and R is the correct explanation of A
- The mitotic division starts as the zygote moves through the isthmus of the oviduct is 137.
 - A) Cleavage
- B) Morula
- C) Trophoblast
- D) Implantation
- 138. The presence of chromogenic substrate gives colonies if the plasmid in a bacterium does not have an insert.
 - A) No colour
- B) Blue colour
- C) No colonies
- D) White colour



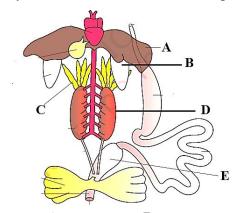


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139. The figure given here shows diagrammatic representation of internal organs of frogs. Identify A to E and select the correct option.



A	В	C	D	E
A) Gall bladder	Liver	Testis	Rectum	Cloaca
B) Liver	Lung	Fat Bodies	Kidney	Rectum
C) Pancreas	Lung	Testis	Liver	Cloaca
D) Liver	Pancreas	Fat Bodies	Gall Bladder	Rectum

- 140. Choose the correct pair in reference to the function.
 - A) Insulin
- Enzyme
- B) Trypsin
- Hormone
- C) GLUT-4
- Enables glucose transport into cells
- D) Antibody
- Amino acid
- 141. Partial pressure (in mmHg) of oxygen and carbon dioxide at different parts involved in diffusion in comparison to these in atmosphere.

Pagnization	Atmospheric air	A Iveoli	Blood	Blood	Tissue
Kespitation	Authospheric an	Aivcon	deoxygenated	oxygenated	1188UC
O_2	A	104	40	D	40
CO ₂	0.3	В	С	40	45

	Α	В	C	D
A)	140	40	45	45
B)	159	45	40	95
C)	159	40	45	95
D)	104	45	40	40

- 142. Globulin is primarily involved in
 - A) Allergic reaction

B) Clotting mechanism

C) Defense mechanism

- D) Osmotic balance
- 143. The volume of blood pumped out by each ventricle per minute is called
 - A) Stroke volume

B) Pace maker

C) Cardiac output

D) Joint diastole







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QUESTION PAPER

- Identify the incorrect statements and choose the correct option accordingly. 144.
 - (i) Interstitial fluid (tissue fluid) and lymph have almost similar composition.
 - (ii) Exchange of the nutrients and gases, etc. between blood and cells always occurs through tissue fluid.
 - (iii) Interstitial fluid has the same mineral distribution as that of the plasma.
 - (iv) Lymph can be defined as the blood minus RBC but has specialised lymphocytes.
 - A) (i) and (ii)

B) (ii) and (iii)

C) (i) and (iv)

- D) None of the above
- Statement I: Kidneys are reddish brown and bean shaped structures. 145.

Statement II: Each kidney of an adult human measures 10 - 12 cm in length, 5 - 7 cm in width, 2-3 cm thickness and average weight is 120-170 g.

- A) Both Statement I and Statement II are incorrect
- B) Statement I is correct but statement II is incorrect
- C) Statement II is correct but statement I is incorrect
- D) Both statement I and statement II are correct
- The given diagram represents the bones of the human arm. Identify the bones marked as I, II, III & IV

	I	П	III	IV
A)	Clavicle	Ulna	Radius	Humerus
B)	Humerus	Radius	Ulna	Scapula
C)	Scapula	Radius	Ulna	Clavicle
D)	Humerus	Ulna	Radius	Scapula



- The cerebrum is longitudinally divided into 2 halves that are connected by the 147.

A) Limbic system B) Corpora quadrigemina

C) Corpus callosum

- D) Cerebral aqueduct
- Which of the following statements are presented correctly? 148.
 - i. Alfred Wallace, a naturalist Malay Archipelago
 - ii. Charles Darwin HMS Beagle Galapagos island
 - A) Only i is correct

B) Only ii is correct

C) Both are correct

- D) Both are incorrect
- Column I list the parts of the human brain and column II lists the functions. Match the 149. two columns and identify the correct option.

Column	. – I	Colum	ın - II
A.	Cerebrum	Ι	Body temperature
B.	Cerebellum	II	Tracts of nerve fibres
C.	Hypothalamus	III	Controls gastric secretions
D.	Medulla oblongata	IV	Convoluted surface



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- A) A II, B IV, C I, D III
- B) A IV, B II, C III, D I
- C) A I, B IV, C III, D II
- D) A III, B IV, C I, D II
- 150. Which of the following statements is / are correct?
 - (i) Endocrine cells present in different parts of the gastro intestinal tract secretes four major peptide hormones, namely gastrin, secretin, cholecystokinin (CCK) and gastric inhibitory peptide (GIP).
 - (ii) Gastrin acts on the gastric glands and stimulates the secretion of hydrochloric acid and pepsinogen.
 - (iii) Secretin acts on the exocrine part of the pancreas and stimulates secretion of water and bicarbonate ions.
 - (iv) GIP inhibits gastric secretion and motility.
 - (v) Hormones produce their effects on target tissues by binding to specific proteins called hormone receptors located in the target tissues only
 - A) only (i), (ii) and (v)

B) only (ii) and (iv)

C) only (v)

- D) all of them
- 151. In the later phase of the pregnancy, the hormone which is also secreted in the ovary is
 - A) Human placental lactogen
- B) Oxytocin

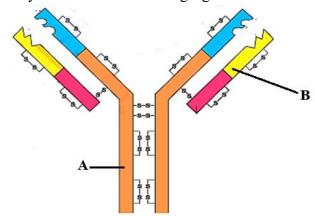
C) Progesterone

- D) Relaxin
- The corpus luteum secretes large amount of progesterone which is essential for 152. maintenance of
 - A) Endometrium

B) Myometrium

C) Menstrual flow

- D) Estrogen
- Which of the following statements is correct regarding the menstrual cycle? 153.
 - A) LH induces rupturing of graafian follicle
 - B) Proliferative phase is characterised by the increased production of progesterone.
 - C) Corpus luteum secretes a large amount of estrogen.
 - D) Both LH and FSH attain a peak level in the secretory phase.
- 154. Identify A & B in the following figure.



- A) A heavy chain, B light chain
- C) A light chain, B light chain
- B) A light chain, B heavy chain
- D) A heavy chain, B heavy chain



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155.	Guess an odd pair from the following.						
	A) Pseudocoelomate - Ascidia	B) Metamerism - Nereis					
	C) Acoelomate - Taenia	D) Coelomate - Laccifer					
156.	Choose the correct statement.						
	h is total well-being in the physical, social,						
	emotional and behavioural aspects of reprod	uction.					
	ii. According to the WHO, reproductive heal	th is total well-being in the physical, social					
	and emotional aspects of reproduction.						
	iii. A reproductively healthy society has peop	ole with physically and functionally normal					
	reproductive organs						
	iv. A reproductively healthy society has	abnormal sex - related emotional and					
	behavioural interaction.						
	A) i, ii and iii B) ii and iv	C) i and iii D) i only					
157.	Statement -A: Reproductive and child health	care programme is for reproduction related					
are	as.						
	Statement -B: It deals with creating awarene	ss among various financial related aspects.					
	A) Statement – A is correct.	B) Statement -B is correct					
	C) Both statements are correct	D) Both statements are incorrect.					
158.	Morgan and his group also found that eve						
chi	romosome, some genes were very tightly l	nked showedwhile others were					
loc	osely linked showed						
	A) Higher recombination, lower recombinat						
	B) Lower recombination, lower recombinat						
	C) Very low recombination, higher recombination						
	D) High recombination, higher recombination						
159.	Assertion(A): Only boy child could be born						
val	line on 6^{th} position of β - chain of haemoglobi						
	Reason (B): This gene for the above mutation						
	A) If both A and R are true and R is correct	•					
	B) If both A and R are true and R is not the	correct explanation of A					
	C) A is true but R is false						
	D) Both A and R are false						
160.	Assertion: Klinefelter's syndrome, Turner	's syndrome and Down's syndrome are					
chi	romosomal disorders.						
	Reason: In Klinefelter's syndrome, the fema						
	A) If both Assertion and Reason are true an	-					
	B) If both Assertion and Reason are true	and R is not the correct explanation of					

Assertion

C) Assertion is true but Reason is falseD) Both Assertion and Reason are false



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161.	The protein encoded by the genes cry IAc a	nd cry II Ab control cotton
	A) Bollworms	B) Ringworm
	C) Flatworm	D) Corn borers
162.	RNA interference involves silencing of a	
	molecule that binds to and prevents trans	
	A) mRNA, dsDNA, mRNA	B) mRNA, dsRNA, mRNA
1.62	C) mRNA, dsRNA, tRNA	D) tRNA, dsRNA, tRNA
163.	If the gene isolate from marrow cells produ	cing ADA is introduced into cells at which
sta	age it could be a permanent cure.	D) E 1 1 1 1 1
	A) Early blastula stage	B) Early embryonic stage
	C) Late embryonic stage	D) Late morula stage
164.	The RNA can be removed by treatment with	ithwhereas protein can be removed by
the	e treatment of	
	A) Ribonuclease, lipase	B) Ribonuclease, protease
	C) Deoxyribonuclease lipase	D) Deoxyribonuclease protease
165.	The following insect represents a particular	ar phenomenon in England, Identify the
co	rrect option.	
	A) Genetic drift	B) Natural selection
	C) Adaptive radiation	D) Convergent evolution
166.	Which ones of the following statements are	correct?
	(i) Proteins are heteropolymers containing s	
	(ii) Biologists describe the protein structure	at four levels.
	(iii) The first amino acid is also called N – 1	
	(iv) Only some portions of the protein threa	d are arranged in the form of a helix.
	(v) The long protein chain is also folded up	_
	rise to the tertiary structure.	, 6
	A) only (ii) and (iii)	B) only (iv) and (v)
	C) only (i) and (iv)	D) all of them are correct
167.	Which of the following hormones is not a st	
	A) Estradiol	B) Epinephrine

C) Cortisol

D) Progesterone

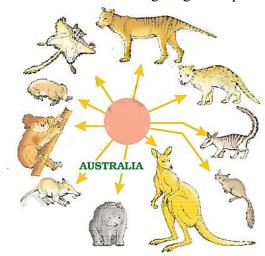


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168. What does the following diagram represent?



- A) Natural selection
- B) Adaptive radiation of marsupials
- C) Placental radiation
- D) Mutation
- 169. Match the columns I and II.

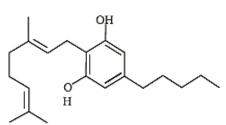
Column – I	Column - II
A.CMI	P. Antibodies are produced outside the body
B. PMNL	Q. Antibodies are produced in the host body
C. Active immunity	R. Cell mediated immunity
D. Passive immunity	S. Leucocytes

A)
$$A - R, B - S, C - Q, D - P$$

B)
$$A - S, B - R, C - P, D - Q$$

C)
$$A - P, B - R, C - Q, D - S$$

D)
$$A - Q$$
, $B - P$, $C - R$, $D - S$



- A) Skeletal structure of cannabinoid
- B) Chemical structure of marijuana
- C) Chemical structure of Morphine
- D) Chemical structure of LSD
- 171. The body in sponges is supported by a skeleton made up of
 - A) Spicule

B) Spongin fibres

C) Spongocoel

- D) Both A & B
- In frog hind limbs have digits and they are than forelimbs that end 172.

digits

- - A) 5, larger and muscular, 4
- B) 4, larger and muscular, 5
- C) 5, smaller and non muscular, 4
- D) 6, larger and neural, 4



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173.	Exoskeleton of arthropods, have a c	omplex polysaccharide called and is
A)	Cellulose, heteropolymer	B) Chitin, homopolymer
	C) Pectin, homopolymer	D) Starch, homopolymer
174.	CO ₂ is carried by haemoglobin as	
	A) Carbonic acid	B) Oxyhaemoglobin
	C) Carbonic anhydrase	D) Carbamino – haemoglobin
175.		ed by a (c) and is unsegmented with a distinct head
mu		hich a (b) and spongy layer of skin forms a
(a)		
	A) (a) Molluscan; (b) Calcareous sl	nell; (c) Visceral hump; (d) Soft; (e) Mantle
	B) (c) Molluscan; (b) Calcareous sl	nell; (a) Visceral hump; (d) Soft; (e) Mantle
	C) (a) Molluscan; (e) Calcareous sh	nell; (c) Visceral hump; (d) Soft; (b) Mantle
	D) (d) Molluscan; (c) Calcareous sl	nell; (e) Visceral hump; (b) Soft; (a) Mantle
176.	Which plays role in the maintenance	ce of pH and ionic balance of blood by selective
sec	eretion of H ⁺ and K ⁺ ion.	
	A) Vasa recta	B) Henle's loop
	C) Proximal convoluted tubule	D) Collecting duct
177.	Pons consists ofthat inte	rconnect different region of the brain
	A) Limbic system	B) Fibre tract
	C) Cerebral aqueduct	D) Spinal cord
178.	Cortisol helps is maintaining	
	A) Kidney function	B) Cardiovascular system
	C) Glucose homeostasis	D) Both A & B
179.	Fill in the blanks.	
	Year Population of India (in million) Population of world (in million)
	1990 280	IDATION MOODBIDRI (R)
	1947 B	2600
	2000 C	D
	2016 E	F
	A) $A - 3500$, $B - 200$, $C - 1000$, D	-6000, E-1300, F-7000
	B) $A - 2000$, $B - 350$, $C - 1000$, $D - 2000$	-6000, E-1300, F-7000
	C) $A - 7000$, $B - 200$, $C - 1000$, $D = 1000$	-6000, E-1300, F-3500
	D) $A - 3500$, $B - 1300$, $C - 1000$, $D = 1000$	O - 6000, E - 200, F - 7000
180.	Select the correct match.	
	A) Ribozyme	Nucleic acid
	B) F ₂ X Recessive parent	Dihybrid cross
	C) T. H. Morgan	Transduction
	D) G. Mendel	Transformation





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1. Ans: B)

$$\begin{aligned} [Qt] &= [M^0L^0T^0] \\ \Rightarrow & [Q] &= [M^0L^0T^{-1}] \\ \frac{[P]}{[Q]} &= [M^0LT^0] \\ [P] &= [M^0LT^0] [M^0L^0T^{-1}] \\ \Rightarrow & [PQ] &= [M^0LT^{-1}] [M^0L^0T^{-1}] \\ [PQ] &= [M^0LT^{-2}] \end{aligned}$$

2. Ans: A)
$$\frac{\Delta t}{t} = \frac{\Delta T}{T} = \frac{0.2}{50}$$

$$\frac{\Delta t}{t} \times 100 = \frac{0.2}{50} \times 100 = 0.4\%$$

3. Ans: D)

Given
$$\sqrt{\frac{2h}{g}} - \sqrt{\frac{2\left(\frac{h}{2}\right)}{g}} = \sqrt{2} - 1$$

 $\sqrt{\frac{h}{g}} \left[\sqrt{2} - 1\right] = \sqrt{2} - 1$
 $\Rightarrow h = 10 \text{ m}$
 $\Rightarrow u = \sqrt{2gh} = \sqrt{2 \times 10 \times 10}$
 $u = 10\sqrt{2} \text{ m/s}$

4. Ans: A)
$$R_{\text{max}} = \frac{u^2}{g} = 50m$$

$$H_{\text{max}} = \frac{u^2}{2g} = \frac{50}{2} = 25m$$

$$\vec{A} + \vec{B} = (2\hat{i} + 3\hat{j}) + (3\hat{i} + 3\hat{j} + 2\hat{k})$$

$$= 5\hat{i} + 6\hat{j} + 2\hat{k}$$

$$\frac{\vec{A} + \vec{B}}{|\vec{A} + \vec{B}|} = \frac{5\hat{i} + 6\hat{j} + 2\hat{k}}{\sqrt{5^2 + 6^2 + 2^2}}$$

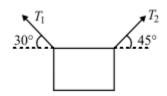
$$= \frac{5\hat{i} + 6\hat{j} + 2\hat{k}}{\sqrt{65}}$$

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6. Ans: B) From F.B.D of block



 $T_1 \cos 30^\circ = T_2 \cos 45^0$

$$\frac{T_1\sqrt{3}}{2} - \frac{T_2}{\sqrt{2}} = 0$$

$$\sqrt{3}T_1 - \sqrt{2}T_2 = 0$$

7. Ans: D)

$$(f_{lim})_B = 4 \times 10 \times 0.5 = 20 \text{ N}$$

Since
$$(f_{lim})_B > F_{applied}$$

⇒ Block B will not move and tension in the will be zero and block A have no pulling for have no tendency to move.

Hence
$$f_A = 0$$

8. Ans: A)

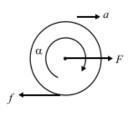
$$W = \vec{F} \cdot \Delta \vec{r}$$

$$W = (\hat{i} + 2\hat{j} + 3\hat{k}) \cdot (3\hat{i} + 4\hat{j} + 5\hat{k})$$

$$= 3 + 8 + 15 = 26 \text{ J}$$

9. Ans: A) Kinetic energy of a moving particle is always positive and it is a scalar quantity.

10. Ans: D)



$$F - f = ma \qquad \dots (1)$$

$$f.R = \frac{2}{5}mR^2.\alpha \qquad (2)$$

$$a = R\alpha$$
(3)

$$f = \frac{2}{5}ma$$



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From equation (1), (2) and (3)

$$F - f = ma$$

$$\Rightarrow F - \frac{2}{5}ma = ma$$

$$\Rightarrow F = \frac{7}{5}ma$$

$$\Rightarrow ma = \frac{5}{7}F$$

$$f = \frac{2}{5}ma = \frac{5}{7}F \times \frac{2}{5} = \frac{2}{7}F$$

- 11. Ans: D) $|\vec{F}_D|$ and for points A, B and C force of interaction is repulsive and for point E. Force is attractive is nature. Hence $\vec{F}_C \cdot \vec{F}_E < 0$ because both are in opposite direction.
- 12. Ans: B) Within elastic limit, elongation is proportional to load because stress ∝ strain.
- 13. Ans: D)

For soap bubble,
$$\Delta P = \frac{4T}{R}$$

$$\frac{\Delta P_1}{\Delta P_2} = \frac{R_2}{R_1} \Rightarrow \frac{R_2}{R_1} = \frac{0.01}{0.02}$$

$$\frac{R_1}{R_2} = 2$$

$$\frac{S_1}{S_2} = \left(\frac{R_1}{R_2}\right)^2 = 4:1$$

- 14. Ans: B) when temperature of liquid increases then coefficient of viscosity decreases.
- 15. Ans: C) For anisotropic material

$$\gamma = \alpha_x + \alpha_y + \alpha_z = \alpha + 2\alpha + 2\alpha = 5\alpha$$

16. Ans: A) Area under the curve for black body spectrum is directly proportional to T⁴.

Hence
$$\frac{A_1}{A_2} = \left(\frac{T_1}{T_2}\right)^4 = \left(\frac{T}{2T}\right)^4$$
 and FOUNDATION MOODBIDRI (R)
$$\frac{A_1}{A_2} = \frac{1}{16}$$

17. Ans: B)

Heat is supplied in process DA and AB $Q_{\rm in} = n = \left(\frac{5R}{2}\right)1000 + n\left(\frac{7R}{2}\right)2000$ $=\left(\frac{19000}{2}\right)nR$ $Q_{\text{rejected}} = -n \left(\frac{5R}{2}\right) 2000 - n \left(\frac{7R}{2}\right) \times 1000$ $=-\left(\frac{17000}{2}\right)nR$ W = Q in + Q rejected



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$$=\frac{19000}{2}nR - \frac{17000}{2}nR = \left(\frac{2000}{2}\right)nR$$

Now, efficiency
$$\eta = \frac{W}{Q_{in}} \Rightarrow \eta = \frac{(2000)\frac{nR}{2}}{19000(\frac{nR}{2})}$$

$$\eta = \frac{2}{19}$$

18. Ans: D)

Given,

 $v_{\rm rms} = v$ for diatomic gas

Temperature = T

 $v_{\rm rms}^1 = 2v$ for monoatomic gas

Let M = molar mass of diatomic gas. Then, as it dissociates into atoms (monoatomic gas), new

molar mass $M' = \frac{M}{2}$. Let T' be the required

temperature.

Now,

rms speed v_{rms} is given as:

$$v_{\text{rms}} = \sqrt{\frac{3RT}{M}}$$
So, $v = \sqrt{\frac{3RT}{M}}$; $2v = \sqrt{\frac{3RT'}{M}}$

or,
$$v^2 = \frac{3RT}{M}$$
; $4v^2 = \frac{3RT \times 2}{M}$

So,
$$\frac{4v^2}{v^2} = \frac{6RT'}{M} \times \frac{M}{3RT}$$

$$4 = \frac{2T'}{T}$$

$$\Rightarrow T' = 2T$$

19. Ans: C)

When a string is compressed then it does not provide any restoring force.

Hence
$$T = \frac{T_1}{2} + \frac{T_2}{2}$$

$$T = \frac{2\pi}{2} \sqrt{\frac{m}{2k}} + \frac{2\pi}{2} \sqrt{\frac{m}{k}} = \pi \sqrt{\frac{m}{k}} \left[\frac{1}{\sqrt{2}} + 1 \right]$$

$$= \left(\sqrt{2} + 1\right) \pi \sqrt{\frac{m}{2k}}$$



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$$f = \frac{v}{2L} = \frac{1}{2L} \sqrt{\frac{T}{\mu}}$$
$$f \propto \sqrt{T}$$

$$f \propto \sqrt{I}$$

$$f^2 \propto T$$

$$\frac{5V}{2L_B} = \frac{3V}{4L_C} = f$$

$$L_B = \frac{10L_C}{3}$$

$$=\frac{10\times18}{2}=60cm$$

22. Ans: B)

$$E_{\text{origin}} = k \left[\frac{Q_1}{r_1^2} + \frac{Q_2}{r_2^2} + \dots \right]$$

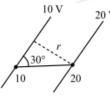
$$= 9 \times 10^9 \times 10^{-6} \left[1 + \frac{1}{2^2} + \frac{1}{4^2} + \dots \right]$$

$$= 9 \times 10^3 \times \frac{1}{1 - \frac{1}{4}}$$

$$= 9 \times \frac{4}{3} \times 10^4 = 12000 \ N/C$$

$$F = qE = 2 \times 12000$$

23. Ans: B)



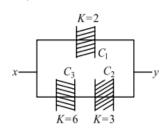


Let any two equipotential surfaces.

Then
$$E = \frac{\Delta V}{r} = \frac{20 - 10}{(0.10 \sin 30^\circ)} = 200 \text{ V/m}$$

Since electric field is normal to equipotential surface and electric field pointed from high potential to low potential.

24. Ans: D) The circuit can be redrawn as





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$$C_{xy} = C_1 + \frac{C_1 C_3}{C_2 + C_3} = \frac{2\varepsilon_0 A}{d} + \frac{\frac{3\varepsilon_0 A}{d} \times \frac{6\varepsilon_0 A}{d}}{\frac{9\varepsilon_0 A}{d}} = \frac{2\varepsilon_0 A}{d} + \frac{2\varepsilon_0 A}{d}$$

$$C_{xy} = \frac{4\varepsilon_0 A}{d}$$

25. Ans: C)
$$R_{eq} = 2 + \frac{2 \times 2}{2 + 2} + 1 = 4\Omega$$

Since no current will flow through 4Ω resistor. Hence $V_{PQ} = \frac{1}{4} \times 12 = 3V$

- 26. Ans: D) In region BC, current 1 is decreasing with increase in voltage. Hence this showing the negative resistance region.
- 27. Ans: C)

$$B = \frac{\mu_0 i}{4\pi d} \left[\sin \theta_1 + \sin \theta_2 \right]$$
$$= \frac{\mu_0 i}{4\pi d} \left[\sin \theta_1 + \sin \theta_2 \right]$$
$$= \frac{\mu_0 i}{8\pi d} \left(\sqrt{3} - 1 \right)$$

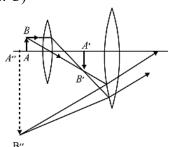
- 28. Ans: B) Magnetic length of a bar magnet is about 0.84 times the geometrical length
- 29. Ans: B) $F = i l_{eff}.B = 2 \times 5 \times 2 = 20 N$
- 30. Ans: C) Eddy current can be minimized by using laminated thin strips of core. Inductor opposes the current change in the electrical circuit. Hence it is called as inertia of the electricity
- 31. Ans: B)

Average current =
$$\frac{\text{Area under curve}}{\text{Time interval}}$$

$$l_{avg} = \frac{\frac{1}{2} \times I_0 \times \frac{T}{2}}{\frac{T}{2}} = \frac{I_0}{2}$$

- 32. Ans: D) Heat radiations are infrared rays i.e. EM wave. it moves with speed of light in air.
- 33. Ans: C)

KARKALA





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As shown in the ray diagram, intermediate image is real inverted and magnified.

34. Ans: C) Focal length of convex mirror, $f = \frac{R}{2}$, it does not depend on the medium in which it is placed.

35. Ans: C)
$$\frac{8\lambda D}{d} = \frac{2\lambda D}{a}$$

$$a = \frac{d}{4} = \frac{3}{4}mm$$

$$a = 0.75mm$$

36. Ans: C)

$$eV = \frac{hv}{\lambda} - \phi$$

$$\frac{hc}{\lambda} = 3eV + 3.2eV$$

$$= 6.2 \text{ eV}$$

$$\lambda = \frac{12400}{6.2} \stackrel{\circ}{A}$$

$$\lambda = 2000 A$$

Hence $\lambda = 2000 A$ lies in UV region.

37. Ans: A)
$$E = mc^2 = \frac{10^{-6} \times (3 \times 10^8)^2}{1.6 \times 10^{-19}} ev = \frac{5.66 \times 10^{29} ev}{1.6 \times 10^{-19}} ev$$

For Lyman series

$$\frac{1}{\lambda_L} = R \left(\frac{1}{1} - \frac{1}{n^2} \right)$$

EATIVE
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For longest wavelength n =2

$$\frac{1}{\lambda_{L, \max}} = R \left(\frac{1}{1} - \frac{1}{2^2} \right)$$

$$\frac{1}{\lambda_{L, \max}} = \frac{3R}{4}$$

For Balmer series

$$\frac{1}{\lambda_B} = R \left(\frac{1}{2^2} - \frac{1}{n^2} \right)$$



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For longest wavelength n = 3

$$\frac{1}{\lambda_B, \max} = R\left(\frac{1}{2^2} - \frac{1}{3^2}\right)$$

$$\frac{1}{\lambda_B, \max} = \frac{5R}{36}$$

$$\frac{\lambda_{L, \max}}{\lambda_B, \max} = \frac{5R}{36} \times \frac{4}{3R} = \frac{5}{27}$$

$$\frac{\lambda_{L, \max}}{\lambda_{B, \max}} = \frac{5}{27}$$

39. Ans: D) By doping with trivalent atom, semiconductor becomes of p-types i.e. $n_h > n_e$ All types of

semiconductor is electrically neutral.

40. Ans: B)
$$X = \overline{\left(\overline{\overline{A+B}}\right) + \left(\overline{\overline{A+B}}\right)} = \left(\overline{A+B}\right)$$

- 41. Ans: D)
- 42. Ans: A)
- 43. Ans: B)
- 44. Ans: A) Choke coil offers reactance but a ideal choke coil has a power factor of zero.
- 45. Ans: B)

CHEMISTRY

- 46. Ans: A
- 47. Ans: D) 6.02×10^{23} molecules of CO = 1 mole of CO

 6.02×10^{24} molecules of CO = 10 mole of CO

1 mole of CO contains 1 g atom of oxygen

10 mole of CO contains 10 g atom of oxygen

48. Ans: C) Energy values are additives $E = E_1 + E_2$

$$\frac{hc}{\lambda} = \frac{hc}{\lambda_1} + \frac{hc}{\lambda_2}$$

$$\frac{1}{\lambda} = \frac{1}{\lambda_1} + \frac{1}{\lambda_2}$$

By substituting $\lambda = 300$ nm, $\lambda_1 = 760$ nm

$$\lambda_2 = 495.6 \text{ nm}, \approx 496 \text{ nm}$$

49. Ans: D) (A) Electrons in 2s and 2p-orbitals have different screening effect. Hence their Z_{eff} is different.

 Z_{eff} off 2s-orbital > Z_{eff} off 2p-orbital.

Therefore, it is not correct.

(B) Energy of 2s-orbital < energy of 2p-orbital.



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Hence, it is not correct.

(C) Z_{eff} of 1s-orbital $\neq Z_{\text{eff}}$ of 2s-orbita;

Hence, it is incorrect.

(D) For the two electrons of 2s-orbital, the value of m_s is $+\frac{1}{2}$ and $-\frac{1}{2}$.

Hence, it is correct.

- 50. Ans: (C) The correct order is Li < B < Be < C. Due to 2s-electrons in B, outer most electron in 2p-orbitals is shielded which results in lowering of ionisation enthalpy
- 51. Ans: (A) Oxidising property depends on the easiness with which the element is reduced, i.e. it gains electrons which in turn is its electronegativities. Electronegativity F > Cl > O > N Thus, (A)
- 52. Ans: D
- 53. Ans: D

	Lone pair	Hybridisation
F—S—F F	1	sp ³ d
F — C—F	0	sp ³
F-Xe-F F	2	sp ³ d

They have different hybridisation and thus, different structure.

54. Ans: A

	σ	and	π	— Ratio			
$ \begin{array}{c} C = N \\ \downarrow \\ A. N = C - C - C = N \\ \downarrow \\ C = N \end{array} $	8	B el 7'	8	1			
B. O=C=O	2		2	1			
C. HHHH	12		3	14 d 15 lg 4			
о. H—С=С—С=С—Н Н Н Н Н	9		2	4.5			

Ratio A = B < C < D

KARKALA



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55. Ans: C) W =
$$-p\Delta V = -p(V_2 - V_1) = -1(10 - 5) = -5$$
 L atm
= -5×101.27 J = -506.35 J
q = 400 J
 $\Delta U = q + W = 400 - 506.35 = -106.35$ J

56. Ans: A)
$$\Delta G = \Delta H - T\Delta S$$

 ΔG is negative when $T\Delta S > \Delta H$

57. Ans: D

$$S^{2-} + S = S_2^{2-}; K_1 = [S_2^{2-}]/[S^{2-}][S]$$

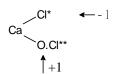
$$S^{2-} + 2S = \mathbb{I} \times S_3^{2-}; K_2 = [S_3^{2-}]/[S^{2-}][S]^2$$

$$S_2^{2-} + S = G_3^{2-}; K_3 = [S_3^{2-}]/[S_2^{2-}][S]$$

We can prove, $K_1K_3 = K_2$

$$\therefore K_3 = \frac{K_2}{K_1} = \frac{132}{12} = 11$$

58. Ans: B



59. Ans: B) Compound formed from A, B and C is that for which sum of oxidation number is zero.

$$A_3$$
 (B C_4)₂ correct
 \uparrow \uparrow \uparrow \uparrow $+6 +10 -16$

60. Ans: C

Here, P = primary carbon atom

Q = quaternary carbon atom

Thus, neo-pentane has four primary carbon atoms, 0-secondary, 0-tertiary and 1quaternary carbon atoms.

61. Ans: C) There is no additional reagent that can form NO_2^+ for nitration.

Thus, -CH₃ group is oxidised to -COOH.



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62. Ans: C) When electrophile attacks $CH_3 - CH = CH_2$ then delocalisation of electrons can take place, in two possible ways

$$CH_3-CH = CH_2 + H^{\dagger} \longrightarrow CH_3 - CH_2 - CH_3 + (2^{\circ} \text{ carbocation})$$

$$CH_3-CH_2-CH_2 - CH_2 \qquad (1^{\circ} \text{ carbocation})$$

As 2° carbanion is more stable than 1° carbanion, thus first addition is more feasible.

63. Ans: D

$$\begin{array}{c} \text{CH}_3 \\ & \mid \\ \text{CH}_3 - \underset{\oplus}{\text{C}} - \underset{\mid}{\text{CH}} - \text{CH}_3 \\ & \mid \\ \text{CH}_3 \\ \text{(IV)} \end{array}$$

64. Ans: A

$$\begin{array}{ccc}
CH \equiv CH & CH_2 = CH_2 & CH_3 - CH_3 \\
\uparrow & \uparrow & \uparrow \\
sp^2 & sp^3
\end{array}$$

Electronegativity of carbon $sp > sp^2 > sp^3$ Acidic $CH = CH > CH_2 = CH_2 > CH_3 - CH_3$

Basic
$$CH \equiv \overset{\Theta}{C}(I) < CH_2 = \overset{\Theta}{C}H(II) < CH_3 - \overset{\Theta}{C}H_2(III)$$

- 65. Ans: B
- 66. Ans: B) Methanol has H-bonding. On adding benzene, the molecules of benzene come in between the molecules of methanol. As a result, H-bonds are broken, i.e., intermolecular forces are weakened. Hence, it shows higher vapour pressure than expected from Raoult's law
- 67. Ans: B

$$\therefore m = \frac{0.18}{0.512}$$

$$\Delta T_f = K_f \times m = 1.86 \times \frac{0.18}{0.512} = 0.654^{\circ}$$

 $\therefore T_f = 0^{\circ} - 0.654^{\circ} = -0.654^{\circ}C$

$$T_f = 0^{\circ} - 0.654^{\circ} = -0.654^{\circ}$$

- 68. Ans: C) Greater conductance by HCl is due to greater mobility of H⁺ ions.
- 69. Ans: B



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Cell reaction is

$$2 \text{ Tl} + \text{Cu}^{2+} \longrightarrow 2 \text{ Tl}^{+} + \text{Cu},$$

$$E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{2 \cdot 303 \text{ RT}}{n \text{ F}} \log \frac{[\text{Tl}^{+}]^{2}}{[\text{Cu}^{2+}]}.$$

- 71. Ans: C
- 72. Ans: A) Cl⁻, S²⁻, P³⁻ are isoelectronic species. Their sizes increase as the nuclear charge decreases from Cl to P.
- 73. Ans: D) Reducing character of hydrides of group 16 elements increases as the thermal stability decreases from H₂S to H₂Te. H₂O does not behave as a reducing agent. H₂Te is the strongest reducing agent.
- 74. Ans; A) Electronegativity decreases from F to I and O is next to F in order of decreasing electronegativity.
- 75. Ans: C) Tungsten, W has the highest melting point (3683 K) among the d-block elements.
- 76. Ans: A

$$K_2Cr_2O_7 + 4H_2SO_4 \longrightarrow$$

$$K_2SO_4 + Cr_2(SO_4)_3 + 4H_2O + 3O$$
or $Cr_2O_7^{2-} + 14H^+ + 6e^- \longrightarrow 2Cr^{3+} + 7H_2O$

$$6Fe^{2+} \longrightarrow 6Fe^{3+} + 6e^-$$

- 77. Ans: D) In case of lanthanoids, the element with xf electrons has a similar colour to that of (14 x)f electrons.
- 78. Ans: B) [Ni(CO)₄] is tetrahedral with sp³ hybridization.
- 79. Ans: C) $[Fe(CN)_6]^{3-}$ is paramagnetic but $[Fe(CN)_6]^{4-}$ is diamagnetic though both are octahedral in shape.
- 80. Ans: A) Brown ring complex obtained in NO₃ test is due to [Fe(H₂O)₅NO]²⁺
- 81. Ans: C

82. Ans: C

This is an example of Birnbaum-Simonini reaction.

83. Ans: C

$$C_3H_7I \xrightarrow{KOH \ alc.} CH_3CH = CH_2 \xrightarrow{NBS, \ hv}$$

$$BrCH_2CH = CH_2 \xrightarrow{KCN \ alc.} NC - CH_2CH = CH_2$$



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- 84. Ans: C) (A) CH₃OH and CH₂CH₂CH₂OH cannot be distinguished because both of them do not react. B) CH₃COCH₃ and CH₃CHOHCH, cannot be distinguished since both of them give iodoform test.
 - C) CH₂CH₂CH₂OH and CH₃CHOHCH, can be distinguished since CH₃CHOHCH₃ gives iodoform test while CH₃CH₂CH₂OH does not.
 - D) CH₂CH₂OH and CH₃OH cannot be distinguished since both of them do not respond to iodoform test
- 85. Ans: C) Phenol is more acidic than ethanol, methanol and p-methylphenol but is less acidic than o-nitrophenol.
- 86. Ans: B

$$PhCH = CH_{2} \xrightarrow{Br_{2}/CCl_{4}} PhCHBr - CH_{2}Br$$

$$\xrightarrow{NaNH_{2}/liq. NH_{3}} PhC \equiv C^{-}Na^{+}$$

$$\xrightarrow{Dil. H_{2}SO_{4}} Ph - COCH_{3}$$

$$\xrightarrow{(B)}$$

- 87. Ans: A) As the size of the alkyl groups around CO group increases, crowding increases and hence reactivity decreases, i.e., CH₃CHO > (CH₃)₂CO > C₂H₅COCH₃
- 88. Ans: B

$$C_6H_6 \xrightarrow{HNO_3/H_2SO_4} C_6H_5NO_2 \xrightarrow{Sn/HCl} C_6H_5NH_2.$$
(A) Aniline (B)

89. Ans: B) Acetamide and ethylamine can be distinguished by heating with NaOH solution when acetamide evolves NH₃ but ethylamine does not.

$$CH_3CONH_2 + NaOH \xrightarrow{\Delta} CH_3COONa + NH_3$$

 $CH_3CH_2NH_2 + NaOH \longrightarrow No reaction.$

90. Ans: B) Guanine is a purine.

BOTANY

91	92	93	94	95	96	97	98	99	100
A	C	D	В	D	D	В	В	A	C
101	102	103	104	105	106	107	108	109	110
В	A	D	C	C	В	A	D	A	A
111	112	113	114	115	116	117	118	119	120
A	В	С	С	С	С	A	A	C	C
121	122	123	124	125	126	127	128	129	130
В	D	A	D	D	A	A	A	В	С
131	132	133	134	135					
D	A	A	В	С					



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136	137	138	139	140	141	142	143	144	145
A	A	В	В	С	C	C	C	D	D
146	147	148	149	150	151	152	153	154	155
В	С	С	A	D	D	A	A	A	A
156	157	158	159	160	161	162	163	164	165
С	A	C	D	С	A	В	В	В	В
166	167	168	169	170	171	172	173	174	175
D	В	В	A	A	D	A	В	D	D
176	177	178	179	180					
D	В	D	В	A					

