1. The displacement x of a particle moving in one dimension under the action of a constant force is related to the time t by the equation $t = \sqrt{x} + 3$, where x is in meter and t is in second. The displacement of the particle when its velocity is zero is

(1) 0 m (2) 6 m

(3) 12 m (4) 18 m

2. A ball is thrown vertically upwards with a velocity of 25ms^{-1} from the top of a tower of height 30 m. How long will it travel before it hits ground?

(1) 6 s (2) 5 s

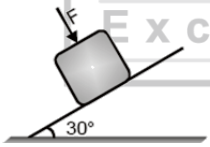
(3) 4 s (4) 12 s

3. The range of a projectile when launched at an angle 15° with the horizontal is 1.5 km. The maximum range of that projectile when launched with the same velocity:

(1) 0.75 km (2) 1.5 km

(3) 3.0 km (4) 6.0 km

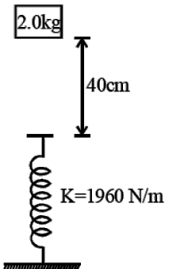
4. A block of mass m = 2 kg is resting on a rough inclined plane of inclination 30° as shown in figure. The coefficient of friction between the block and the plane is μ = 0.5. What minimum force F should be applied perpendicular to the plane on the block, so that block does not slip on the plane (g=10m/s^2)



(1) Zero (2) 6.24 N

(3) 2.68 N (4) 4.34 N

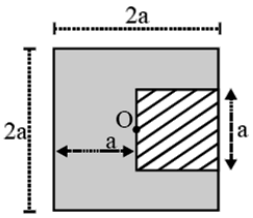
5. A 2.0 kg block is dropped from a height of 40 cm on to a spring of spring constant K = 1960 N/m. Find the maximum distance by which the spring is compressed: (Take g = 9.8 m/s^2)



(1) 0.080 m (2) 0.2 m

(3) 0.40 m (4) 0.10 m

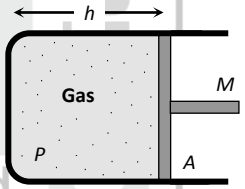
6. A plate of uniform thickness is shown in figure. It's center of mass is at origin O. Now if the shaded area is removed, the new position of the centre of mass is:



(1) $\frac{a}{6}\hat{i}$ (3) $\frac{a}{3}\hat{i}$

(3) $\frac{-a}{3}\hat{i}$ (4) $\frac{-a}{6}\hat{i}$

7. A cylindrical piston of mass *M* slides smoothly inside a long cylinder closed at one end, enclosing a certain mass of gas. The cylinder is kept with its axis horizontal. If the piston is disturbed from its equilibrium position, it oscillates simple harmonically. The period of oscillation will be *[here considering the process to take place gradually (i.e. isothermal)]*



(1) $T = 2\pi\sqrt{\left(\frac{Mh}{PA}\right)}$ (2) $T = 2\pi\sqrt{\left(\frac{MA}{Ph}\right)}$

(3) $T = 2\pi\sqrt{\left(\frac{M}{PAh}\right)}$ (4) $T = 2\pi\sqrt{MPhA}$

8. The work done in slowly lifting a body from earth's surface to height R (radius of earth) as equal to two times the work done in lifting the same body from earth's surface to a height h. here h is equal to

(1) $\frac{R}{4}$ (2) $\frac{R}{3}$

(3) $\frac{R}{6}$ (4) $\frac{R}{2}$

9. A small planet is revolving around a very massive star in a circular orbit of radius R with a period of revolution T. If the gravitational force between the planet and the star were proportional to $R^{-5/2}$, then T would be proportional to:

(1) $R^{3/2}$ (2) $R^{3/5}$

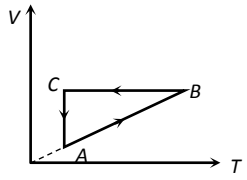
(3) $R^{7/2}$ (4) $R^{7/4}$

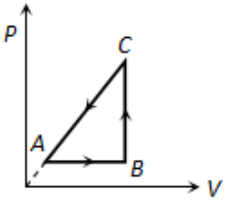
10. A physical quantity x depends on quantities y and z as follows: $x = Ay + B\tan Cz$, where A, B and C are constants. Which of the following do not have the same dimensions

(1) x and B (2) C and z^{-1}

(3) y and B/A (4) x and A

11. A cyclic process *ABCA* is shown in the *V*-*T* diagram. Process on the *P*-*V* diagram is



(1)


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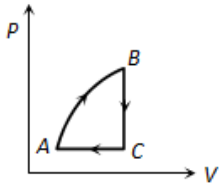

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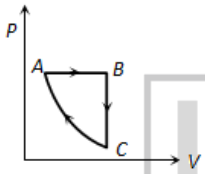
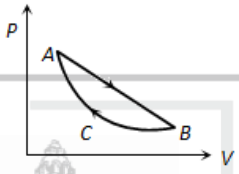


(4)


12. A cylinder of radius R made of a material of thermal conductivity K_1 is surrounded by a cylindrical shell of inner radius R and outer radius 2R made of material of thermal conductivity K_2. The two ends of the combined system are maintained at two different temperatures. There is no loss of heat across the cylindrical surface and the system is in steady state. The effective thermal conductivity of the system is

(1) $K_1 + K_2$ (2) $\dfrac{K_1 K_2}{K_1 + K_2}$

(3) $\dfrac{K_1 + 3K_2}{4}$ (4) $\dfrac{3K_1 + K_2}{4}$

13. The metallic bob of simple pendulum has the relative density ρ. The time period of this pendulum is *T*. If the metallic bob is immersed in water, then the new time period is given by

(1) $T\left(\dfrac{\rho - 1}{\rho}\right)$ (2) $T\left(\dfrac{\rho}{\rho - 1}\right)$

(3) $T\sqrt{\dfrac{\rho - 1}{\rho}}$ (4) $T\sqrt{\dfrac{\rho}{\rho - 1}}$

14. Match List-I with List-II.

	List-I		List-II
(i)	Source of microwave frequency	a.	Radioactive decay of nucleus
(ii)	Source of infrared frequency	(b)	Magnetron valve
(iii)	Source of gamma rays	(c)	Inner shell electrons
(iv)	Source of X-ray	(d)	Vibration of atoms and molecules
		(e)	LASER
		(f)	*R*-*C* circuit

Choose the correct answer from the options given below.

(1) i - f, ii - d, iii - d, iv - e

(2) i - f, ii - e, iii - a, iv - d

(3) i - b, ii - d, iii - f, iv - c

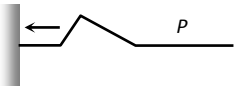
(4) i - b, ii - d, iii - a, iv - c

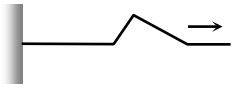
15. The displacement of a particle is given by $y = a + bt + ct^2 - dt^4$. The initial velocity and acceleration are respectively

(1) $b, -4d$ (2) $-b, 2c$

(3) $b, 2c$ (4) $2c, -4d$

16. Figure here shows an incident pulse *P* reflected from a rigid support. Which one of *A, B, C, D* represents the reflected pulse correctly



(1)


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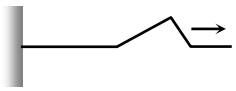

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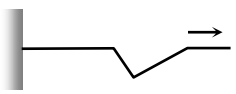

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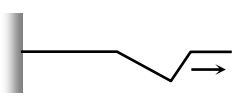


17. Which of the following function represents a simple harmonic oscillation

(1) $\sin\omega t - \cos\omega t$

(2) $\sin^2 \omega t$

(3) $\sin\omega t + \sin 2\omega t$

(4) $\sin\omega t - \sin 2\omega t$

18. A body is moved along a straight line by a machine delivering a constant power. The distance moved by the body in time t is proportional to

(1) $t^{3/4}$ (2) $t^{3/2}$

(3) $t^{1/4}$ (4) $t^{1/2}$

19. The minimum speed for a particle at the lowest point of a vertical circle of radius *R*, to describe the circle is '*v*'. If the radius of the circle is reduced to one-fourth its value, the corresponding minimum speed will be

(1) $\frac{v}{4}$ (2) $\frac{v}{2}$

(3) 2*v* (4) 4*v*

20. A uniform chain of length 2m is kept on a table such that a length of 60cm hangs freely from the edge of the table. The total mass of the chain is 4kg. What is the work done in pulling the entire chain on the table?

(1) 7.2 J (2) 3.6 J

(3) 120 J (4) 1200 J

21. A uniform electric field of 20 N/C exists along the x-axis in space. The potential difference ($V_B - V_A$) for the points A (4m, 2m) and B (6m, 5m) is:-

(1) $20\sqrt{13} volt$

(2) – 40 volt

(3) + 40 V

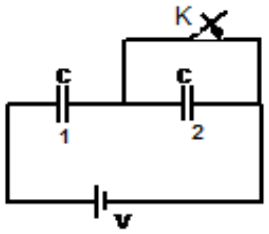
(4) $-20\sqrt{13} volt$

22. Two positive ions, each carrying a charge q, are separated by a distance d. If F is the force of repulsion between the ions, the number of electrons missing from each ion will be (e being the charge on an electron)

(1) $\frac{4\pi\varepsilon_0 Fd^2}{e^2}$ (2) $\sqrt{\frac{4\pi\varepsilon_0 Fe^2}{d^2}}$

(3) $\sqrt{\frac{4\pi\varepsilon_0 Fd^2}{e^2}}$ (4) $\frac{4\pi\varepsilon_0 Fd^2}{q^2}$

23. The charge flowing across the cell on closing the key k is equal to



(1) CV (2) CV/2

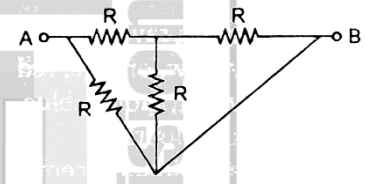
(3) 2CV (4) zero

24. A charge Q is distributed over two concentric hollow spheres of radii r and R $(R > r)$ such that the surface densities are equal. The potential at the common centre is

(1) $\frac{Q(R^2 + r^2)}{4\pi\varepsilon_0 (R + r)}$ (2) $\frac{Q}{R + r}$

(3) Zero (4) $\frac{Q(R + r)}{4\pi\varepsilon_0 (R^2 + r^2)}$

25. The equivalent resistance between points A and B is



(1) 2R (2) $\frac{3}{4}$R

(3) $\frac{4}{3}$R (4) $\frac{3}{5}$R

26. A toroid of core of inner radius 0.25 m and outer radius 0.26 m around which 3500 turns of a wire are wound. It the current in the wire is 11 A, then magnetic field inside the core of the toroid is

(1) 3×10^2 T (2) 3×10^{-2} T

(3) 3×10^{-7} T (4) 3×10^7 T

27. An electron is travelling horizontally towards East. A magnetic filed in vertically downward direction exerts a force on the electron along

(1) East (2) West

(3) North (4) South

28. Magnetic intensity is define by

(1) $H = \frac{B}{\mu_0} - I$ (2) $H = \frac{B}{\mu_0} + I$

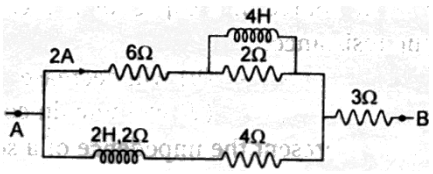
(3) $H = \mu_0 (I - B)$ (4) $H = \frac{2B}{\mu_0} - I$

29. The inductance of a closed-packed coil of 400 turns is 8 m*H*. A current of 5 m*A* is passed through it. The magnetic flux through each turn of the coil is

(1) $\frac{1}{4\pi}\mu_0 Wb$ (2) $\frac{1}{2\pi}\mu_0 Wb$

(3) $\frac{1}{3\pi}\mu_0 Wb$ (4) $0.4\,\mu_0 Wb$

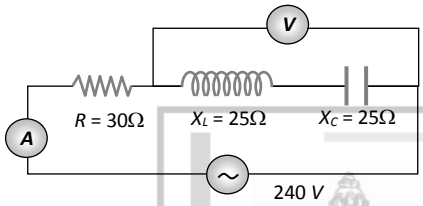
30. Find $V_A - V_B$ in steady state



(1) 8 V (2) 16 V

(3) 24 V (4) data is insufficient

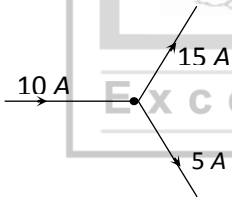
31. In the circuit shown in figure neglecting source resistance the voltmeter and ammeter reading will respectively, will be



(1) 0*V*, 3*A* (2) 150*V*, 3*A*

(3) 150*V*, 6*A* (4) 0*V*, 8*A*

32. Is it possible



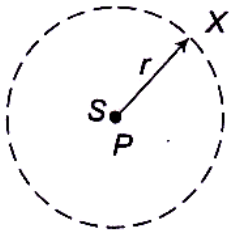
(1) Yes

(2) No

(3) Cannot be predicted

(4) Insufficient data to reply

33. Calculate the electric and magnetic fields produced by the radiation coming from a 30πW bulb at a distance of 3 m. Assume that the efficiency of the bulb is 10% and it is a point source.



(1) 6.66 V/m, 0.88 x 10^{-8} T

(2) 10 V/m, 0.88 x 10^{-8} T

(3) 2.66 V/m, 0.88 x 10^{-8} T

(4) 0.88 x 10^{-8} V/m, 2.66 T

34. A concave mirror of focal length 60 cm forms a real image of size 5 times size of a real object then Distance between mirror and object.

(1) 48 cm (2) 80 cm

(3) 56 cm (4) 72 cm

35. A convex lens forms a real image of an object for its two different positions on a screen. If height of the image in both the cases be 8 *cm* and 2 *cm*, then height of the object is

(1) 16 *cm* (2) 8 *cm*

(3) 4 *cm* (4) 2 *cm*

36. In double slit experiment, the angular width of the fringes is 0.20° for the sodium light (λ =5890 Å). In order to increase the angular width of the fringes by 10%, the necessary change in the wavelength is

(1) Increase of 589 Å

(2) Decrease of 589 Å

(3) Increase of 6479 Å

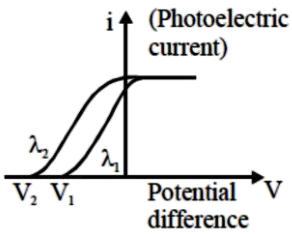
(4) Zero

37. Two polaroids are placed in the path of unpolarized beam of intensity I_0 such that no light is emitted from the second polaroid. If a third Polaroid whose polarization axis makes an angle θ with the polarization axis of first polaroid, is placed between these polaroids then the intensity of light emerging from the last polaroid will be

(1) $\left(\frac{I_0}{8}\right)\sin^2 2\theta$ (2) $\left(\frac{I_0}{4}\right)\sin^2 2\theta$

(3) $\left(\frac{I_0}{2}\right)\cos^4\theta$ (4) $I_0\cos^4\theta$

38. In the following diagram if $V_2 > V_1$ then



(1) $\lambda_1 = \sqrt{\lambda_2}$ (2) $\lambda_1 < \lambda_2$

(3) $\lambda_1 = \lambda_2$ (4) $\lambda_1 > \lambda_2$

39. A photosensitive metallic surface has work function hv_0. If photons of energy $2hv_0$ fall on this surface the electrons come out with a maximum velocity of 4×10^6 m/s. When the photon energy is increases to $5hv_0$ then maximum velocity of photo electron will be:-

(1) 2×10^6 m/s

(2) 2×10^7 m/s

(3) 8×10^5 m/s

(4) 8×10^6 m/s

40. The electron in a hydrogen atom makes a transition from an excited state to the ground state. Which of the following statements is true

(1) Its kinetic energy increases and its potential and total energies decrease

(2) Its kinetic energy decreases, potential energy increases and its total energy remains the same

(3) Its kinetic and total energies decrease and its potential energy increases

(4) Its kinetic, potential and total energies decreases

41. Imagine an atom made up of a proton and a hypothetical particle of double the mass of the electron but having the same charge as the electron. Apply the Boh'r atom model and consider all possible transitions of this hypothetical particle to the first excited level. The longest wavelength photon that will be emitted has wavelength λ (given in terms of the Rydberg constant R for the hydrogen atom) equal to

(1) 9/(5*R*) (2) 36/(5*R*)

(3) 18/(5*R*) (4) 4/R

42. Atomic weight of boron is 10.81 and it has two isotopes ${}_5B^{10}$ and ${}_5B^{11}$. Then ratio of ${}_5B^{10}$: ${}_5B^{11}$ in nature would be

(1) 19 : 81 (2) 10 : 11

(3) 15 : 16 (4) 81 : 19

43. There are two metallic spheres of same radii but one is solid and the other is hollow, then

(1) Solid sphere can be given more charge

(2) Hollow sphere can be given more charge

(3) They can be charged equally (maximum)

(4) None of the above

44. A long solenoid is formed by winding 20 *turns/cm*. The current necessary to produce a magnetic field of 20 *millitesla* inside the solenoid will be approximately

$(\frac{\mu_0}{4\pi} = 10^{-7}\ tesla-metre/ampere)$

(1) 8.0 *A* (2) 4.0 *A*

(3) 2.0 *A* (4) 1.0 *A*

45. Three photo diodes D_1, D_2 and D_3 are made of semiconductors having band gap of 2.5 eV, 2 eV and 3 eV, respectively. Which one will be able to detect light of wavelength 6000Å?

(1) D_1 (2) D_2

(3) D_3 (4) D_1 and D_2 both

46. **Assertion (A):-** Rate of reaction increases with rise in temperature.

Reason (R):- Activation energy of reaction decreases with rise in temperature.

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is incorrect but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

47. 0.20 g of organic compound gives 25 ml of N_2 at STP by duma's method, calculate percentage of Nitrogen-

(1) 13.7 (2) 14.8

(3) 15.6 (4) 18

48. At 300 K, initially 1 mole each of CO & H_2O are present in 10 L vessel and at equilibrium sum of moles of CO_2 & H_2 is found to be 0.8. Find the equilibrium constant (K_C) for the reaction:

$CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_{2(g)}$

(1) $\frac{4}{9}$ (2) $\frac{1}{4}$

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

49. For following transformation, identify the incorrect reaction:

H_2O (ℓ, 1 atm, 373 K) $\rightarrow$ H_2O (g, 1 atm, 373 K)

(1) $\Delta H > 0$ (2) $\Delta S > 0$

(3) $\Delta G < 0$ (4) $\Delta S_{Total} = 0$

50. The enthalpy of neutralisation of NH_4OH with HCl is –51.46 kJ mol^{-1} and the enthalpy of neutralisation of NaOH with HCl is –55.90 kJ mol^{-1}. The enthalpy of ionisation of NH_4OH is:

(1) +107.36 kJ mol^{-1} (2) –4.44 kJ mol^{-1}

(3) –107.36 kJ mol^{-1} (4) +4.44 kJ mol^{-1}

51. Total number of nodes is given by :-

(1) n – 1 (2) n – ℓ – 1

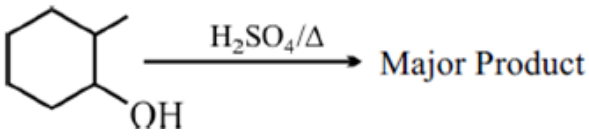
(3) ℓ (4) n + ℓ

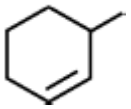
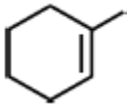
52. At 298 K, vapour pressure of dichloromethane (CH_2Cl_2) and chloroform ($CHCl_3$) are 415 mm Hg and 200 mm Hg respectively. An ideal solution is prepared by mixing 85 g of CH_2Cl_2 (mol. wt. = 85) and 59.75 g of $CHCl_3$ (mol. wt. = 119.5) at 298 K. calculate mole fraction of CH_2Cl_2 in vapour phase.

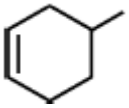
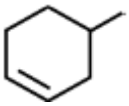
(1) 0.80 (2) 0.72

(3) 0.20 (4) 0.28

53.



(1)  (2) 

(3)  (4) 

54. Most reactive alkyl halide towards S_N1 reaction:

(1) $CH_3 – Cl$

(2) $CH_3 – CH_2 – Cl$

(3) $(CH_3)_2 CH–Cl$

(4) $(CH_3)_3 C – Cl$

55. Maximum torsional strain is in:

(1) Staggered form

(2) Eclipsed form

(3) Skew form

(4) All have same

56. The weight of C atoms in 2.01×10^{23} molecules of CO is:

(1) 4g (2) 3g

(3) $\frac{1}{3}g$ (4) 12 g

57. The molar conductivity of 0.1 M HCOOH(aq) is 80 Scm^2 mol^{-1}. The maximum molar conductivity of HCOOH is 400 Scm^2 mol^{-1}. The dissociation constant of HCOOH is:

(1) 4×10^{-3} (2) 5×10^{-3}

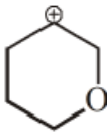
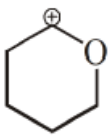
(3) 4×10^{-5} (4) 5×10^{-5}

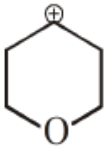
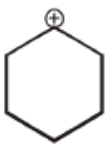
58. The value of $\frac{t_{93.75\%}}{t_{50\%}}$ for 1st order reaction is:

(1) 5 (2) 3

(3) 4 (4) 2

59. Most stable carbocation is :-

(1)  (2) 

(3)  (4) 

60. Match the Column.

Column-I		Column-II	
A	$Ar\overset{\oplus}{N}_2\ X^{\Theta} \xrightarrow[HCl]{Cu_2Cl_2}$	p	Gattermann reaction.
B	$Ar\overset{\oplus}{N}_2\ X^{\Theta} \xrightarrow{Cu/HCl}$	q	Sandmeyer reaction
C	$Ph-NH_2 \xrightarrow[\Lambda]{CHCl_3/KOH}$	r	Carbylamine reaction
D	$Ph-\overset{O}{\overset{\|}{C}}-NH_2 \xrightarrow[\Lambda]{Br_2+KOH}$	s	Hoffman bromamide reaction

(1) A → p, B → q, C → r, D → s

(2) A → q, B → p, C → r, D → s

(3) A → q, B → p, C → s, D → r

(4) A → s, B → r, C → q, A → p

61. Major product formed by the dehydration of 2-methyl-2-butanol is-

(1) 2-Methyl – 1- butene

(2) 2- Methyl – 2- butene

(3) 1- Methylcyclopentene

(4) 1- Methylcyclohexene

62. What happens to degree of ionisation of a weak binary electrolyte if its solution is diluted 100 times.

(1) Unchanged (2) Increases

(3) Decreases (4) Unpredictable

63. Which of the following statement is incorrect?

(A) Number of oxygen atoms are same in 1g O_2 & 1g O_3

(B) 1g – molecule of any substance contains equal number of atoms

(C) Reactant having minimum number of moles, acts as limiting reagent

(D) During a chemical reaction, total number of moles may increase or decrease or remain constant

(1) A, D (2) B, C

(3) A, B (4) A, B, D

64. What is the major product of the reaction between 1- butene and HBr in the presence of peroxides?

(1) 1- Bromo butane

(2) 2- Bromo butane

(3) 2- Methyl – 1- bromo butane

(4) 1- Methyl – 2- bromo butane

65. Match the coordination compounds given in Column – I with the central metal atoms given in Column – II and choose the correct option given below.

Column - I		Column - II	
a	Chlorophyll	i	Rhodium
b	Haemoglobin	ii	Cobalt
c	Wilkinson catalyst	iii	Iron
d	Vitamin B_{12}	iv	Magnesium

(1) a – (iv), b – (iii), c – (i), d – (ii)

(2) a – (iv), b – (iii), c – (ii), d – (i)

(3) a – (ii), b – (i), c – (iii), d – (iv)

(4) a – (i), b – (iii), c – (ii), d – (iv)

66. When hydrogen peroxide is added to acidified potassium dichromate, a blue colour is produce due to formation of "X". The oxidation state and number of peroxy linkage in "X' are respectively.

(1) 6 & 4 (2) 4 & 4

(3) 6 & 2 (4) 3 & 2

67. Which of them has maximum number of unpaired electron?

(1) d^8, tetrahedral complex

(2) d^8, square planar complex

(3) d^6, Octahedral, inner orbital complex

(4) d^6, Octahedral, outer orbital complex

68. Which of the following has shortest metal carbon bond length?

(1) $[Cr(CO)_6]$ (2) $[Mn(CO)_6]^+$

(3) $[Fe(CO)_4]^{-2}$ (4) $[V(CO)_6]^-$

69. The mixed anhydride of nitrogen is.

(1) N_2O_2 (2) N_2O_4

(3) N_2O_3 (4) N_2O_5

70. **Statement-I**:- It is observed that polar solutes dissolve in polar solvents and non polar solutes in non polar solvents.

Statement-II:- In general, a solute dissolves in a solvent if the intermolecular interactions are similar in the two.

(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

71. A white powder when strongly heated gives off brown fumes. A solution of this powder gives a yellow precipitate with a solution of KI. When a solution of barium chloride is added to a solution of powder, a white precipitate results. This white powder may be

(1) A soluble sulphate (2) KBr or NaBr

(3) $Ba(NO_3)_2$ (4) $AgNO_3$

72. A mixture of salt rotten egg smell when treated with dilute H_2SO_4 and it turns lead acetate paper black, then salt contain_____.

(1) SO_3^{-2} (2) S^{-2}

(3) CH_3COO^- (4) NO_3^-

73. Which of the following Radicals give white precipitate with NaOH (Solution)

(1) Pb^{+2} (2) Zn^{+2}

(3) Al^{+3} (4) All of these

74. What is the change in oxidation number of carbon in the following reaction?

$$C_6H_6(\ell) + Cl_2(g) \xrightarrow{AlCl_3} C_6H_5Cl(\ell) + HCl(g)$$

(1) 0 to –4 (2) +4 to +3/4

(3) 0 to +4 (4) –1 to 2/3

75. Select most endothermic process:

(1) $O \rightarrow O^-$ (2) $O^- \rightarrow O^{-2}$

(3) $O \rightarrow O^{-2}$ (4) $N \rightarrow N^-$

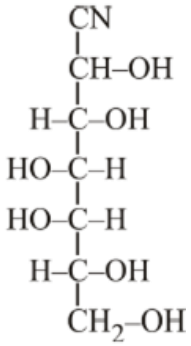
76. According to Nernst equation which of the following is not correct if Q= K_C?

(1) $E_{cell} = 0$ (2) $E^o_{cell} = \frac{RT}{nF}\ell nK_C$

(3) $K_C = e^{\frac{nFE^o_{cell}}{RT}}$ (4) $E_{cell} = E^o_{cell}$

77. D(+) glucose react with hydrogen cynide and yields an cynohydrine the structure of the cynohydrine would by

(1)



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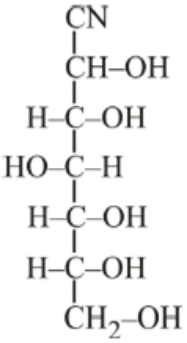

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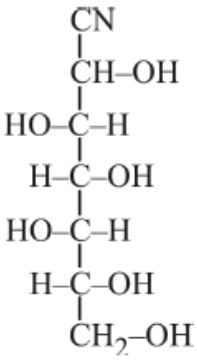

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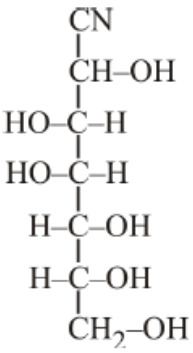


78. **Statement I:** According to Bohr's atomic model, qualitatively the magnitude of velocity of electron increases with increase in positive charge on the nucleus.

Statement II: According to Bohr's atomic model, qualitatively the magnitude of velocity of electron increases with decrease in principal quantum number.

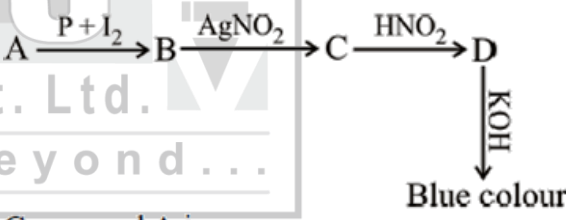
(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

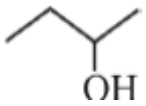
(4) Both Statement I and Statement II are correct.

79.

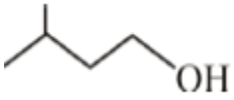


Compound A is :

(1)



(2)



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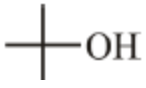

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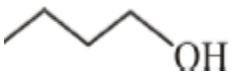


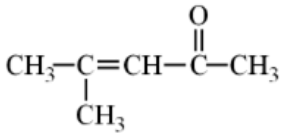
80. Which conformation of n – butane is of lowest energy:

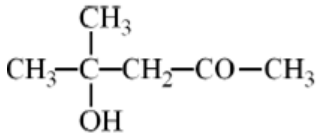
(1) Gauche (2) Ellipsed

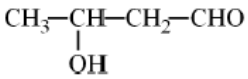
(3) Fully ellipsed (4) Staggered (Anti)

81. Which of the following product is formed when propanone undergoes aldol condensation:

(1) $CH_3 - CH = CH - CHO$

(2) 

(3) 

(4) 

82. Which two are closet to one another is size?

(1) Li^+, Mg^{+2} (2) Na^+, K^+

(3) Fe^{+2}, Ni^{+2} (4) Li^+, Na^+

83. According to experimental evidences, S_E (electrophilic aromatic substitution reactions) is not supposed to proceed via which step.

(1) Generation of electrophiles

(2) Formation of carbocation intermediate

(3) Addition of $Nu^{\ominus}$ on carbocation

(4) Removal of proton from the carbocation intermediate.

84. Which of the following hydroxide can't be written as $M_2O_3.xH_2O$ form?

(1) $Fe(OH)_3$ (2) $Cr(OH)_3$

(3) $Al(OH)_3$ (4) $Ce(OH)_3$

85. Which of the following option is correct?

(1) BCl_3 reacts with gaseous NH_3 to give $B(NH_2)_3$

(2) In $T\ell I_3$, oxidation state of thallium is +3.

(3) Conversion of ozone to oxygen proceeds with decrease in entropy.

(4) None of these

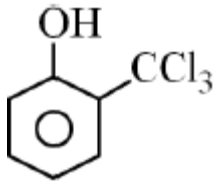
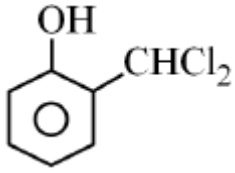
86. Among the given oxides. If x oxide are only acidic and y oxide are neutral. Find sum of x +y?

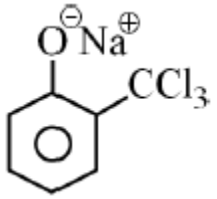
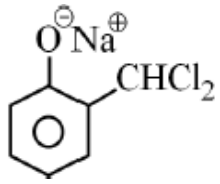
CO_2, SiO_2, SnO_2, PbO_2, CO, BaO

(1) 2 (2) 3

(3) 4 (4) 1

87. Which of the following is intermediate of Reimer Tiemann reaction?

(1)  (2) 

(3)  (4) 

88. Determine the equivalent mass As_2S_3 in the following reaction

$As_2S_3 + NO_3^- + H^+ \rightarrow AsO_4^{3-} + SO_4^{2-} + NH_3 + H_2O$

(1) Molar mass / 4

(2) Molar mass / 18

(3) Molar mass / 28

(4) Molar mass / 24

89. Match the column:

List-I (Pair of species)		List-II (Same characteristics in pair)	
P	(CH_4, NH_3)	1	d-orbital participation in hybridisation of central atom is observed
Q	(PF_5, $IC\ell_3$)	2	Tetrahedral geometry of central atom
R	($BeC\ell_2$, SO_3)	3	At least one $p\pi$-$p\pi$ bond is present
S	(CO_2, SO_2)	4	Planar
		5	All possible bond angles are $\geq 90°$

The correct code is:-

(1) P→2, 4; Q→2; R→4, 5; S→2, 3, 5

(2) P→2, 3; Q→3; R→1, 3; S→1, 4, 5

(3) P→2, 5; Q→1; R→4, 5; S→3, 4, 5

(4) P→2, 5; Q→1; R→1, 2; S→2, 4, 5

90. **Assertion:** Pentane and 2-methyl pentane are homologues.

Reason: Pentane is straight chain alkane, while 2-methyl pentane is a branched chain alkane.

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is incorrect but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

91. In taxonomic hierarchy, the number of similar characters of categories decreases from

(a) Kingdom to species

(b) Lowest to highest rank

(c) Highest to lowest rank

The correct option is:

(1) Only (a) (2) Both (b) and (c)

(3) Only (b) (4) Both (a) and (c)

92. Presence of epicalyx and monadelphous condition of stamens is characteristic feature of the family:

(1) Liliaceae (2) Malvaceae

(3) Leguminosae (4) Solanaceae

93. Vascular bundles are conjoint and open in

(1) Dicot root (2) Monocot root

(3) Dicot stem (4) Monocot stem

94. Mark the incorrect one w.r.t dicot root

(1) Pericycle gives rise to lateral roots and vascular cambium.

(2) Vascular bundles is of polyarch type

(3) Tissues on inner side of endodermis such as pericycle, vascular bundles and pith constitute the stele.

(4) Pith is small and inconspicuous.

95. **Assertion A:** Mosses are of great ecological importance

Reason R: Mosses along with lichens are the first organism to colonise rocks.

(1) Both A and R are true but R is NOT the correct explanation of A

(2) A is true but R is false.

(3) A is false but R is true

(4) Both A and R are true and R is the correct explanation of A.

96. A human population is said to be mature or, stable when

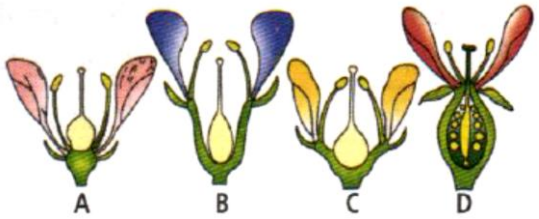
(1) Age pyramid for human population appears triangular in shape

(2) Growth rate of the population becomes almost zero

(3) The base of age pyramid has a very high proportion of pre-reproductive individuals

(4) Age pyramid for human population is of Urn shaped

97. Based on the position of floral parts on thalamus the flowers are described as hypogynous perigynous and epigynous. Which of the following floral forms (A-D) represent the flowers of Rosa (Rose) and Prunus (Plum) respectively?



(1) A and B (2) B and C

(3) C and D (4) B and D

98. Mark the incorrect match

(1) Pinus — Branched stem

(2) Cycas — Pinnate leaves

(3) Ginkgo biloba — Contain seeds

(4) Cedrus —Homosporous

99. Mark the incorrect one for features of human genome.

(1) The human genome contains 3164.7 million nucleotide bases

(2) Chromosome 4 has the fewest genes

(3) Less than 2% of the genome codes for proteins

(4) The average gene consists of 3000 bases

100. The physical process w.r.t treatment of waste water involves

(A) Removal of floating debris

(B) Formation of flocs in aeration tank

(C) Digestion of bacteria and fungi present in sludge in anaerobic sludge digester

(D) Removal of soil and small pebbles

The correct option is

(1) A and B (2) B and C

(3) C and D (4) A and D

101. Which of the given is not a green alga?

(1) Eudorina (2) Ectocarpus

(3) Ulothrix (4) Spirogyra

102. Vasa recta is absent or highly reduce in

(1) Cortical nephrons

(2) Juxta medullary nephrons

(3) Both (1) and (2)

(4) None of these

103. **Statement I:** Basophil are involved in inflammatory action

Statement II: Basophil use to secrete histamine, serotonin and heparin

(1) Both statement I and statement II are incorrect.
(2) Statement I is correct but statement II is incorrect.
(3) Statement I is incorrect but statement II is correct.
(4) Both statement I and statement II are correct.

104. The beginning of atrial diastole coincides with

(1) End of ventricular systole
(2) Beginning of ventricular diastole
(3) Beginning of ventricular systole
(4) Beginning of atrial systole

105. Complete the analogy w.r.t symmetry of their body.

Hydra : Radial symmetry :: Taenia :

Choose the correct option.

(1) Asymmetry
(2) Biradial symmetry animals and
(3) Bilateral symmetry
(4) Radial symmetry

106. Exclusively marine animals in which reproduction takes place only by sexual means are placed in which of the following phylum?

(1) Porifera (2) Coelenterata
(3) Ctenophora (4) Platyhelminthes

107. Which of the following is the most abundant chemical in living organisms?

(1) Proteins (2) Carbohydrates
(3) Lipids (4) Water

108. **Statement I:** Bud is not present in the axil of leaflets of the compound leaf

Statement II: Leaves become fleshy in onion and garlic to store food

(1) Both statement I and statement II are incorrect.
(2) Statement I is correct but statement II is incorrect.
(3) Statement I is incorrect but statement II is correct.
(4) Both statement I and statement II are correct.

109. First action spectrum of photosynthesis was described by

(1) T.W. Engelmann (2) C.V. Niel
(3) J.V. Sachs (4) Jan Ingenhousz

110. Identify the incorrect statements:

A. Biological classification of plants and animals was first proposed by Aristotle
B. Linnaeus classify all living organism into two kingdoms Archaea and Eukarya
C. Whittaker in 1869 proposed a five kingdom classification
D. Aristotle used simple morphological characters to classify plants into trees , shrubs and herbs
E. Aristotle was the earliest to attempt a more scientific basis of classification

Choose the **correct** answer from the options given below:

(1) A and D only (2) A, B and D only
(3) B and C only (4) B, C and E only

111. Match List I with List II:

	List I		List II
A.	Tapetum	I.	Inner wall of pollen grain made up of pecto-cellulose
B.	Epidermis	II.	Inner most wall layer of microsporangium
C.	Exine	III.	Outer most wall layer of microsporangium help in dehiscence of anther
D.	Intine	IV.	Hard outer layer of pollen grains

Choose the **correct** answer from the options given below:

(1) A-IV, B-III, C-II, D-I
(2) A-III, B-I, C-IV, D-III
(3) A-II, B-I, C-IV, D-III
(4) A-II, B-III, C-IV, D-I

112. Coding strand in transcription unit

(1) Have same sequence as of mRNA except thymine at the place of uracil
(2) Is also called template strand
(3) Has polarity always in 3' — 5' direction
(4) Undergoes the process of transcription at the same time with non-coding stand

113. **Statement I:** Stanford biologist Paul Ehrlich used 'rivet popper hypothesis' to explain how species richness contributes to well-being of an ecosystem
Statement II: Keystone species are those that forms major part of any ecosystem by biomass
(1) Both statement I and statement II are incorrect
(2) Statement I is correct but statement II is incorrect.
(3) Statement I is incorrect but statement II is correct.
(4) Both statements I and statement II are correct.

114. The parasitic fungi causing rust disease on mustard is
(1) Albugo (2) Phytophthora
(3) Puccinia (4) Claviceps

115. In Mendel's dihybrid cross for seed shape and seed colour the F, progeny produced with genotype RrYy : rrYy : Rryy : rryy are respectively
(1) 4:2:2:1 (2) 2:4:2:1
(3) 2:2:4:1 (4) 1:2:2:4

116. Which of the following components of phloem is made up of sclerenchymatous cells?
(1) Companion cells (2) Bast fibre
(3) Sieve tubes (4) Sieve cells

117. Find out the incorrect match
(1) Epiphyllous — Stamens are attached to the petals
(2) Polyadelphous — Stamens united in more than two bundles
(3) Staminode — Sterile stamen
(4) Staminate flower — Male flower

118. Read the given statements.
(i) Gynoecium occupies the highest position while the other floral parts are situated below it.
(ii) Ovary is superior.
(iii) Examples are Brassica, Hibiscus, brinjal, etc.
Which condition of flowers is being described by the above statements?
(1) Hypogyny (2) Perigyny
(3) Epigyny (4) None of these

119. Select the correct statement w.r.t pollen grain
(1) Exine is rich in pecto-cellulose
(2) Viability of pollen grains of wheat and rice is of many years
(3) Pollen kit is present in pollen grains of entomophilous plants
(4) Vegetative cell floats in the cytoplasm of generative cell.

120. Stem tendrils occur in
(a) Watermelon
(b) Cucumber
(c) Pumpkin
(1) (a) only (2) (a) and (b) only
(3) (b) and (c) only (4) All (a), (b) and (c)

121. Match the Column

	Column I		Column II
A.	Brassicaceae	I.	% ♂ P_0 or 2 (Lodicules) $A_{3 \text{ or } 6}$ $\underline{G_1}$
B.	Fabaceae	II.	⊕ ♀ $K_{(5)}$ $\overset{\frown}{C_{(5)}}$ A_5 $\underline{G_2}$
C.	Solanaceae	III.	% ♂ ♀ $K_{(5)}$ $C_{1+2+(2)}$ $A_{(9)+1}$ $\underline{G_1}$
D.	Gramineae	IV.	⊕ ♂ ♀ K_{2+2} C_4 A_{2+4} $\underline{G_{(2)}}$
E.	Compositae	V.	⊕ ♂ ♀ Ep_{5-7} $K_{(5)}$ $\overset{\frown}{C_5}$ $A_{(\infty)}$ $G_{(5)}$
F.	Malvaceae	VI.	**Ray florets :** Br % ♀ K_0 or P $C_{(5)}$ A_0 $\overline{G_2}$

(1) A: IV, B: III, C: II, D: I, E: VI, F: V
(2) A: I, B: III, C: II, D: IV, E: VI, F: V
(3) A: IV, B: III, C: V, D: II, E: VI, F: I
(4) A: II, B: IV, C: II, D: V, E: VI, F: I

122. Given below are two statements:
Statement I: Dominance is not an autonomous feature of a gene.
Statement II: Dominance is much depends on the gene product.
(1) Both statement I and statement II are incorrect
(2) Statement I is correct but statement II is incorrect.
(3) Statement I is incorrect but statement II is correct.
(4) Both statements I and statement II are correct.

123. Which one of the following plants shows alternate phyllotaxy?
(1) Sunflower (2) Guava
(3) Nerium (4) Calotropis

124. Match List I with List II:

	List I		List II
A.	Exons	I.	Mostly found in prokaryotes
B.	Polycistronic gene	II.	Sequence that appears in processed m-RNA
C.	hn-RNA	III.	Precursor of m-RNA
D.	Anticodon loop	IV.	t-RNA

Choose the **correct** answer from the options given below:

(1) A-IV, B-I, C-II, D-III
(2) A-II, B-I, C-III, D-IV
(3) A-III, B-I, C-IV, D-II
(4) A-II, B-II, C-I, D-IV

125. Which of the given are correct for Ascomycetes?

(a) Hyphae is aseptate
(b) Motile stage do not occur in life cycle
(c) Asexual reproduction occurs mostly by conidia
(d) Ascospores are formed exogenously

(1) a and b (2) b and c
(3) c and d (4) a and d

126. Which of the following is incorrectly matched?

(1) Dedifferentiated — Interfascicular Tissue cambium
(2) Bulliform cells — Found in grasses
(3) Monocot stem — Phloem parenchyma absent
(4) Bean shape guard cells — Grasses

127. In plants, cell wall is made up of:

(1) Cellulose
(2) Hemicellulose
(3) Pectins and proteins
(4) All of the above

128. Tetramerous flowers having bicarpellary, syncarpous ovary which is unilocular in the beginning but become bilocular later, owing to the formation of false septum called replum are the salient features of the family:

(1) Leguminosae (2) Malvaceae
(3) Solanaceae (4) Cruciferae

129. Which of the given structures in bacterial cell helps in respiration and DNA replication?

(1) Glycocalyx (2) Slime layer
(3) Chromatophores (4) Mesosome

130. The end products of fermentation is/are

(a) CO_2 (b) Ethanol
(c) Oxygen (d) Acetaldehyde

(1) (a) only
(2) (a) and (b) only
(3) (b) and (c) only
(4) (c) and (d) only

131. Read the given statements and select the correct ones

A. Gibberellins promotes bolting in beet
B. Inhibitor-B is ethylene
C. Decapitation helps in hedge-making
D. Cytokinin promote rapid internode elongation in deep water rice plant

(1) A and C only (2) B and D only
(3) A and D only (4) AII A, B, C and D

132. Ovary containing the false septum occurs in

(1) Primrose (2) Dianthus
(3) Argemone (4) Pisum sativum

133. The most problematic aquatic weed introduced by Europeans in India is

(1) Parthenium (2) Azolla
(3) Eichhornia (4) Rauwolfia

134. **Assertion A:** Photorespiration is wasteful process
Reason R: It results in release of CO_2 and there is no synthesis of ATP or NADPH

(1) Both **A** and **R** are correct but R is not the correct explanation of A.
(2) **A** is correct but **R** is not correct.
(3) **A** is not correct but **R** is correct.
(4) Both **A** and **R** are correct but R is the correct explanation of A.

135. Select the disease in which glucose metabolism is not affected

(1) Type I diabetes mellitus
(2) Type II diabetes mellitus
(3) Diabetes insipidus
(4) Cushing syndrome

136. Given below are two statements:

Statement I: Hypothalamus controls body temperature, urge of eating and drinking

Statement II: Medulla control respiration, cardiovascular reflexes and gastric secretion

(1) Both statement I and statement II are incorrect.

(2) Statement I is correct but statement II is incorrect.

(3) Statement I is incorrect but statement II is correct.

(4) Both statement I and statement II are correct.

137. Select the correct one(s) w.r.t. polygene inheritance

(a) Also called quantitative inheritance

(b) Intermediate phenotypes are more frequent

(c) Bell shaped curve is obtained

(1) (a) only

(2) (b) and (c) only

(3) (a) and (c) only

(4) Al (a), (b) and (c)

138. Which of the following hormone support pregnancy and stimulate the formation of alveoli and milk secretion

(1) Insulin (2) Oxytocin

(3) Progesterone (4) Relaxin

139. Spiracles in the body of *Periplaneta americana* are A and are present on B aspect of the body. Choose the option which correctly fills the blanks.

	A	B
(1)	20 pairs	Ventral
(2)	12 pairs	Lateral
(3)	13 pairs	Dorsal
(4)	10 pairs	Lateral

140. Select incorrect statement about inspiration

(1) Require contraction of diaphragm

(2) Require contraction of internal inter-costal muscles

(3) Require increase in volume of thoracic chamber

(4) Require decrease in volume of thoracic chamber

141. Which one of the following bones does not occur in pairs in human body?

(1) Malleus and femur

(2) Tibia and stapes

(3) Hyoid and sternum

(4) Incus and stapes

142. The congenital disease which cannot be diagnosed using amniocentesis is

(1) Down syndrome

(2) Cleft palate

(3) Haemophilia

(4) Adenosine deaminase deficiency

143. A koala and kangaroo exhibit which process of evolution w.r.t. each other?

(1) Saltation

(2) Adaptive radiation

(3) Convergent evolution

(4) Adaptive convergence

144. Dub is associated with

(1) Closure of Right AV valve

(2) Closure of left AV valve

(3) Closure of semilunar valve

(4) Closure of tricuspid valve

145. Erythropoietin, a hormone which stimulates formation of RBCs is produced by

(1) Pancreas

(2) Juxtaglomerular cells of kidney

(3) Adrenal glands

(4) Podocytes of Bowman's capsule

146. **Assertion A:** Frogs maintain ecological balance.

Reason R: Frog serve as important link of food chain and food web in the ecosystem.

(1) Both A and R are true but R is NOT the correct explanation of A

(2) A is true but R is false.

(3) A is false but R is true

(4) Both A and R are true and R is the correct explanation of A.

147. Which of the following hormones play a critical role in inducing the rupture of Graafian follicle?

(1) Estrogen only

(2) Follicle stimulating hormone (FSH)

(3) Luteinizing hormone (LH)

(4) Progesterone

148. Which of the following infections can be associated with AIDS patients?

a. Fungal infection
b. Toxoplasma infection
c. Mycobacterium infection
d. Viral infection

Choose the correct option from the following.

(1) a and b only
(2) b and c only
(3) a, b, c and d
(4) a and d only

149. The secondary oocyte is released from the ovary

(1) Before the formation of first polar body
(2) After the formation of first polar body
(3) Before the formation of first and second polar bodies
(4) After the release of first and second polar bodies

150. Every 500 mL of deoxygenated blood delivers approximately_____ mL of CO_2 to the alveoli. Choose the option which fills the blank correctly.

(1) 5mL (2) 100 mL
(3) 20 mL (4) 200 mL

151. Which of the following is not a feature of pBR322 and its use as cloning vector in genetic engineering?

(1) pBR322 has a size of about 4.3 kb and has a reasonable high copy number
(2) Selection is a two-step process as two sets of antibiotic resistance genes are used
(3) Selection of recombinants due to inactivation of antibiotics is an easy procedure
(4) Selection of recombinants requires simultaneous plating on two plates having different antibiotics

152. Pouched mammals of Australia survived because of

(1) Presence of eutherians in Australia
(2) Presence of eutherians in South America
(3) Lack of competition from eutherians and predators (carnivores)
(4) Convergent evolution of marsupials and placental mammals in Australia

153. Select the correct match regarding the disorders of muscular or skeletal system:

(1)	Myasthenia gravis	Genetic disorder which inhibits sliding of myosin filaments.
(2)	Gout	Inflammation of joints due to deposition of oxalates
(3)	Muscular dystrophy	Age related shortening of muscles
(4)	Osteoporosis	Decrease in bone mass and higher chances of fracture with advancing age

154. Identify the incorrect statements:

A. Podocytes are arranged in such manner that they leave minute space called filtration slits.
B. 100-200 ml of blood is filtered by the kidneys per minute
C. GFR in a healthy person is approx.125 ml/sec
D. Reabsorption in Henle's loop is minimum
E. Nitrogen waste form filtrate is absorb by passive transport

Choose the **correct** answer from the options given below:

(1) A and D only (2) A, B and D only
(3) B and C only (4) B, C and E only

155. A and B are the two terms having similar meaning of location. Select the option which correctly represents A and B:

	A	**B**
(1)	Plasma	- Serum
(2)	AV node	- Pace maker
(3)	Leucocytes	- Thrombocytes
(4)	Mitral valve	- Bicuspid valve

156. The correct sequence of brain meninges from inner to outside in mammals is

(1) Dura mater — arachnoid — pia mater
(2) Dura mater — Piamater — arachnoid
(3) Piamater — Arachnoid — dura mater
(4) Arachnoid — Dura mater — pia mater

157. What is the approximate ratio of residual volume to total lung capacity?

(1) 1:4 (2) 1:5
(3) 5:1 (4) 2:5

158. Consider the following four statements (a-d) regarding organ transplantation and select the option including correct statements only.

a. Even if kidney transplantation is proper, donor may need to take immunosuppressants for a long time.

b. The cell-mediated immune response is mainly responsible for graft rejection.

c. Antibodies synthesized by T-lymphocytes participate in graft rejection.

d. The acceptance or rejection of a graft like kidney transplant depends on specific interferons.

(1) a and b (2) b and c

(3) c and d (4) a and d

159. In which one of the following ratios, sodium potassium pumps exchange the K^+ and Na^+ in a nerve fibre?

(1) 3:4 (2) 2:3

(3) 1:2 (4) 3:1

160. Match the following columns A and B and choose the correct option.

Column-A	**Column-B**
A. HIV	(i) Physiological barriers
B. Graft rejection	(ii) Retrovirus
C. Saliva	(iii) CMI
D. Widal test	(iv) Typhoid

(1) A(ii), B(iii), C(i), D(iv)

(2) A(ii), B(iv), C(i), D(iii)

(3) A(iv), B(iii), C(ii), D(i)

(4) A(ii), B(i), C(ii), D(iv)

161. **Assertion (A):** Thymus is considered as 'biological clock' of the body.

Reason (R): Pineal gland secretes melatonin, which plays a very important role in the regulation of diurnal rhythm of our body.

(1) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(2) Both (A) and (R) are true and (R) is the correct explanation of (A)

(3) (A) is true, (R) is false

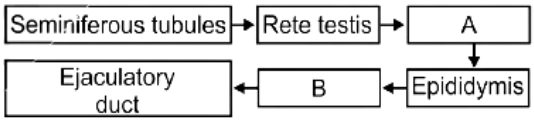
(4) (A) is false, (R) is true

162. Cockroach has exoskeleton of

(1) Chondrin (2) Chitin

(3) Collagen (4) Cellulose

163. The path of sperm transport is given below. Choose the option which fills the blanks A and B correctly.



	A	**B**
(1)	Vasa efferentia	Urethra
(2)	Vas deferens	Vasa efferentia
(3)	Vasa efferentia	Vas deferens
(4)	Seminiferous tubules	Vas deferens

164. Parathormone deficiency causes muscle cramps or tetany as a result of

(1) Increased Na^+ level in blood

(2) Increased Ca^{+2} level in blood plasma

(3) Decreased phosphate level in muscles

(4) Decreased Ca^{+2} level in the body

165. Choose the correct sequence of events during embryonic development of humans, if, A= fertilization, B=cleavage, C = zygote, D=morula, E = gastrula and F = blastocyst.

(1) ABCDEF (2) ABDFEC

(3) ACBDFE (4) ACBFDE

166. Forelimbs of an insect, praying mantis and human perform the same function of grasping. These are:

(1) Homologous organs

(2) Analogous organs

(3) Vestigial organs

(4) Atavism

167. Match items in column-I with those in column-II and choose the correct option.

	Column-I		**Column-II**
(A)	Infectious disease	(i)	Not transmit From one organism to another
(B)	AIDS	(ii)	Metastasis
(C)	Non-infectious Disease	(iii)	Easily transmitted from one person to another
(D)	Cancer	(iv)	Reduced number of Helper T-cells

Options:

(1) A(i), B(ii), C(iii), D(iv)

(2) A(iii), B(iv), C(i), D(ii)

(3) A(iii), B(ii), C(i), D(iv)

(4) A(iv), B(ii), C(iii), D(i)

168. Which of the following set of diseases are transmitted by insect vector?
(1) Typhoid, Jaundice, Tuberculosis
(2) Mumps, Measles, Small pox
(3) Ringworm, Amoebiasis, Filariasis
(4) Malaria, Filariasis, Dengue

169. Heat shock method in bacterial transformation facilitates
(1) Binding of DNA to the cell wall
(2) Uptake of DNA through membrane transport proteins.
(3) Uptake of DNA through transient pores in the bacterial cell wall
(4) Expression of antibiotic resistance gene

170. Select incorrect statement about Trichoderma
(1) Trichoderma species are usually free-living fungi.
(2) Trichoderma are effective biocontrol agent of many plant pathogens
(3) They are very common in the root ecosystem
(4) It belongs to class phycomycetes of fungus

171. Today transgenic models have been developed for many human diseases which includes
(a) Alzheimer's disease
(b) Rheumatoid arthritis
(c) Cancer
(d) Cystic fibrosis
Choose the correct option
(1) (a) and (b) only (2) (b) and (c) only
(3) (c) and (d) only (4) (a), (b), (c) and (d)

172. Choose the incorrect match.
(1) Chitin - Polymer of N-acetyl glucosamine
(2) Inulin - Polymer of fructose
(3) Lipids - Polymer of fatty acids
(4) Starch - Polymer of glucose

173. Which of the given is/are involved during replication on template strand with polarity 3' — 5'
(A) Primase (RNA polymerase)
(B) DNA ligase
(C) Ribonucleoside triphosphate
(D) DNA dependent DNA polymerase
The correct option is
(1) B and D (2) Only D
(3) Only C (4) A,C and D

174. All of the following structures are lined by brush border epithelium except
(1) Fallopian tubes
(2) PCT
(3) Trachea and bronchi
(4) Bronchioles

175. Variation in the length of filament within a flower occurs in.
(1) Salvia & Tomato
(2) Salvia & Mustard
(3) Mustard & Potato
(4) Mustard & Tomato

176. Which of the given is not a characteristic of a population?
(1) Birth rate (2) Age of an individual
(3) Death rate (4) Sex ratio

177. Penicillium secretes penicillin, that inhibits the growth of large number of bacteria. It reflects which of the given population interactions?
(1) Commensalism (2) Mutualism
(3) Amensalism (4) Protocooperation

178. In accordance with life styles, parasites have evolved all of the special adaptations, except
(1) Loss of unnecessary sense organ
(2) Loss of digestive system
(3) Presence of adhesive organs
(4) Decreased reproductive capacity

179. In rosette plants, bolting is promoted by the hormone that
(1) Is used to increase the size of apple
(2) Delays the senescence of intact leaves and other plant parts
(3) Promotes abscission of flowers and fruits
(4) Inhibits seed germination

180. Which of the following processes from a-d are included under downstream processing? Select the correct answer from the following options.
a. Separation of the product
b. Purification of the product
c. Preservation of product preservative
d. Quality control testing
(1) a, b and c only (2) a, b and d only
(3) b, c and d only (4) a, b, c and d

Syllabus

FT – 9

Day & Date : 11 June, 2026
Time : 10: 00 AM to 1: 00 PM
Physics : FULL COURSE
Chemistry : FULL COURSE
Biology : FULL COURSE