PMT TEST SERIES
AIIMS ONLINE

Date 25-02-2018

INSTRUCTIONS

MAXIMUM MARKS : 200   **TIME : 3:30 HR.**

➢ There are 200 questions carrying ONE mark each. There shall be 1/3-ve marking.
Answer with no response will be awarded zero mark.

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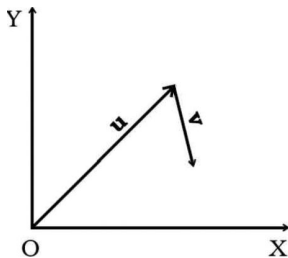
PHYSICS

01. A lift is coming from 8th floor and is just about to reach 4th floor. Taking ground floor as origin and positive direction upwards for all quantities, which one of the following is correct?
(a) $x < 0, v < 0, a > 0$
(b) $x > 0, v < 0, a < 0$
(c) $x > 0, v < 0, a > 0$
(d) $x > 0, v > 0, a < 0$

02. Figure shows the orientation of two vectors u and v in the XY plane.

If $u = a\hat{i} + b\hat{j}$ and $v = p\hat{i} + q\hat{j}$

which of the following is correct?
(a) a and p are positive while b and q are negative.
(b) a, p and b are positive while q is negative
(c) a, q and b are positive while p is negative
(d) a, b, p and q are all positive.

03. A body of mass 2kg travels according to the law (t) $= pt + qt^2 + rt^3$ where p = 3ms^{-1} , q = 4ms^{-2} and r = 5ms^{-3}. The force acting on the body at t = 2 seconds is
(a) 136 N
(b) 134 N
(c) 158 N
(d) 68 N

**04.** A body with mass 5 kg is acted upon by a force $F = (-3\hat{i} + 4\hat{j})$ N. If its initial velocity at t = 0 is $v = (6\hat{i} - 12\hat{j})$ ms^{-1}, the time at which it will just have a velocity along the y-axis is
(a) never
(b) 10 s
(c) 2 s
(d) 15 s

05. A bicyclist comes to a skidding stop in 10 m. During this process, the force on the bicycle due to the road is 200N and is directly opposit to the motion. The work done by the cycle on the road is
(a) + 2000J
(b) –200J
(c) zero
(d) –20,000J

06. Two inclined frictionless tracks, one gradual and the other steep meet at A from where two stones are allowed to slide down from rest, one on each track as shown in Fig.
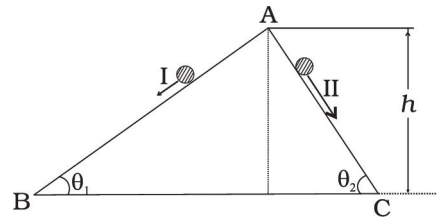

Which of the following statement is correct?
(a) Both the stones reach the bottom at the same time but not with the same speed.
(b) Both the stones reach the bottom with the same speed and stone I reaches the bottom earlier than stone II.
(c) Both the stones reach the bottom with the same speed and stone II reaches the bottom earlier than stone I.
(d) Both the stones reach the bottom at different times and with different speeds.

07. A body of mass 0.5 kg travels in a straight line with velocity v = a x$^{3/2}$ where a = 5 m$^{-1/2}$s^{-1}. The work done by the net force during its displacement from x = 0 to x = 2 m is
(a) 1.5 J
(b) 50 J
(c) 10 J
(d) 100 J

08. A uniform square plate has a small piece Q of an irregular shape removed and glued to the centre of the plate leaving a hole behind (Fig.). The moment of inertia about the z-axis is then
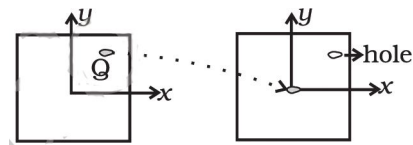
(a) increased
(b) decreased
(c) the same
(d) changed in unpredicted manner.

09. A body is suspended from a spring balance kept in a satellite. The reading of the balance is W_1 when the seatellite goes in an orbit of radius R and is W_2 when it goes in an orbit of radius 2R.
(a) $W_1 = W_2$
(b) $W_1 < W_2$
(c) $W_1 > W_2$
(c) $W_1 \neq W_2$.

PMT Test Series

10. A bimetallic strip is made of aluminium and steel ($\alpha_{Al} > \alpha_{steel}$). On heating, the strip will
    (a) remain straight
    (b) get twisted
    (c) will bend with aluminium on concave side
    (d) will bend with steel on concave side

11. An aluminium sphere is dipped into water. Which of the following is true?
    (a) Buoyancy will be less in water at 0°C than that in water at 4°C.
    (b) Buoyancy will be more in water at 0°C than that in water at 4°C.
    (c) Buoyancy in water at 0°C will be same as that in water at 4°C.
    (d) Buoyancy may be more or less in water at 4°C depending on the radius of the sphere.

12. The radius of a metal sphere at room temperature T is R, and the coefficient of linear expansion of the metal is α. The sphere is heated a little by a temperature ΔT so that its new temperature is $T + \Delta T$. The increase in the volume of the sphere is approximately
    (a) $2\pi R \alpha \Delta T$ (b) $\pi R^2 \alpha \Delta T$
    (c) $4\pi R^3 \alpha \Delta T/3$ (d) $4\pi R^3 \alpha \Delta T$

13. If an average person jogs, she produces 14.5×10^4 cal/min. This is removed by the evaporation of sweat. The amount of sweat evaporated per minute (assuming 1 kg requires 580×10^3 cal for evaporation) is
    (a) 0.25 kg   (b) 2.25 kg   (c) 0.05 kg   (d) 0.20 kg

14. Three copper blocks of masses M_1, M_2 and M_3 kg respectively are brought into thermal contact till they reach equilibrium. Before contact, they were at T_1, T_2, T_3 ($T_1 > T_2 > T_3$). Assuming there is no heat loss to the surroundings, the equilibrium temprature T is (s is specific heat of copper)

    (a) $T = \dfrac{T_1 + T_2 + T_3}{3}$

    (b) $T = \dfrac{M_1 T_1 + M_2 T_2 + M_3 T_3}{M_1 + M_2 + M_3}$

    (c) $T = \dfrac{M_1 T_1 + M_2 T_2 + M_3 T_3}{3(M_1 + M_2 + M_3)}$

    (d) $T = \dfrac{M_1 T_1 s + M_2 T_2 s + M_3 T_3 s}{M_1 + M_2 + M_3}$

15. 1 mole of an ideal gas is contained in a cubical volume V, ABCDEFGH at 300 K (Fig.). One face of the cube (EFGH) is made up of a material which totally absorbs any gas molecule incident on it. At any given time,
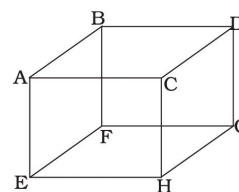

    (a) the pressure on EFGH would be zero.
    (b) the pressure on all the faces will the equal.
    (c) the pressure of EFGH would be double the pressure on ABCD.
    (d) the pressure on EFGH would be half that on ABCD.

16. 1 mole of H_2 gas is contained in a box of volume V = 1.00 m^3 at T = 300K. The gas is heated to a temperature of T = 3000K and the gas gets converted to a gas of hydrogen atoms. The final pressure would be (considering all gases to be ideal)
    (a) same as the pressure initially.
    (b) 2 times the pressure initially.
    (c) 10 times the pressure initially.
    (d) 20 times the pressure initially.

17. A particle is acted simultaneously by mutually perpendicular simple hormonic motions $x = a \cos \omega t$ and $y = a \sin \omega t$. The trajectory of motion of the particle will be
    (a) an ellipse.   (b) a parabola.
    (c) a circle.   (d) a straight line.

18. The displacement of a particle varies with time according to the relation
    $y = a \sin \omega t + b \cos \omega t$.
    (a) The motion is oscillatory but not S.H.M.
    (b) The motion is S.H.M. with amplitude $a + b$.
    (c) The motion is S.H.M. with amplitude $a^2 + b^2$.
    (d) The motion is S.H.M. with amplitude $\sqrt{a^2 + b^2}$.

19. Figure shows the circular motion of a particle. The radius of the circle, the period, sense of revolution and the initial position are indicated on the figure. The simple harmonic motion of the x-projection of the radius vector of the rotating particle P is
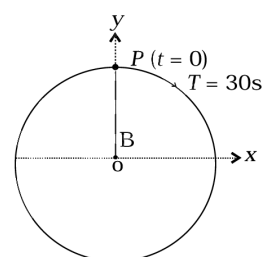
(a) $x(t) = B \sin\left(\dfrac{2\pi t}{30}\right)$ (b) $x(t) = B \cos\left(\dfrac{\pi t}{15}\right)$

(c) $x(t) = B \sin\left(\dfrac{\pi t}{15} + \dfrac{\pi}{2}\right)$ (d) $x(t) = B \cos\left(\dfrac{\pi t}{15} + \dfrac{\pi}{2}\right)$

20. When a mass m is connected individually to two springs S_1 and S_2, the oscillation frequencies are v_1 and v_2. If the same mass is attached to the two springs as shown in Fig., the oscillation frequency would be

(a) $v_1 + v_2$.   (b) $\sqrt{v_1^2 + v_2^2}$
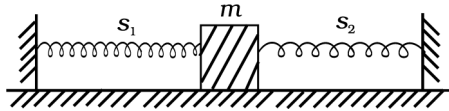
(c) $\left(\dfrac{1}{v_1} + \dfrac{1}{v_2}\right)$ (d) $\sqrt{v_1^2 - v_2^2}$

21. Which of the following statements are true for wave motion?
(a) Mechanical transverse waves can propagate through all mediums.
(b) Longitudinal waves can propagate through solids only.
(c) Mechanical transverse waves can propagate through solids only.
(d) Longitudinal waves can propagate through vacuum.

22. Equation of a plane progressive wave is given by y $= 0.6 \sin 2\pi\left(t - \dfrac{x}{2}\right)$. On reflection from a denser medium its amplitude becomes 2/3 of the amplitude of the incident wave. The equation of the reflected wave is

(a) $y = 0.6 \sin 2\pi\left(t + \dfrac{x}{2}\right)$ (b) $y = -0.4 \sin 2\pi\left(t + \dfrac{x}{2}\right)$
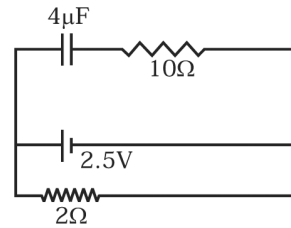
(c) $y = 0.4 \sin 2\pi\left(t + \dfrac{x}{2}\right)$ (d) $y = -0.4 \sin 2\pi\left(t - \dfrac{x}{2}\right)$

23. The bulb each of rating 60 W, 120 V are connected as shown in figure. The ratio of power consumed in bulb B_1 to the power consumed B_2
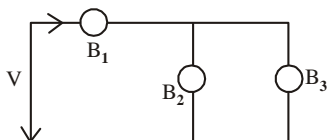
(a) 1 : 4   (b) 1 : 2   (c) 2 : 1   (d) 4 : 1

24. A capacitor of 4μF is connected as shown in the circuit (Fig.). The internal resistance of the battery is 0.5Ω. The amount of charge on the capacitor plates will be

(a) 0   (b) 4μC   (c) 16μC   (d) 8μC

25. Two non-ideal batteries are connected in parallel. Consider the following statements :
(A) The equivalent emf is smaller than either of the two emfs.
(B) The equivalent internal resistance is smaller than either of the two internal resistances.
(a) Both A and B are correct.
(b) A is correct but B is wrong.
(c) B is correct but A is wrong
(d) Both A and B are wrong.
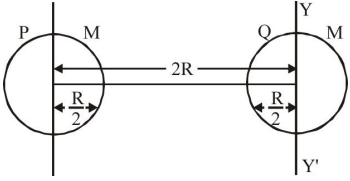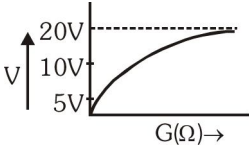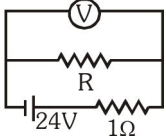
26. Figure (A) shows an imaginary cube of edge L/2. A uniformly charged rod of lengh L moves towards left at a small but constant speed v. At t=0, the left end just touches the centre of the face of the cube opposite it. Which of the graphs shown in figure (B) represents the flux of the electric field through the cube as the rod goes through it?
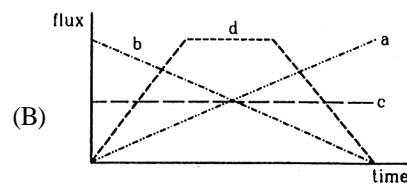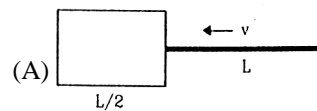
(a)   (b)   (c)   (d)

27. In a cyclotron, a charged particle
(a) undergoes acceleration all the time
(b) speeds up between the dees because of the magnetic field
(c) speeds up in a dee
(d) slows down within a dee and speeds up between dees

28. A toroid of n turns, mean radius R and cross-sectional radius a carries current I. It is placed on a horizontal table taken as x-y plane. Its magnetic moment m

(a) is non-zero and points in the z-direction by symmetry.

(b) points along the axis of the tortoid (m = m).

(c) is zero, otherwise there would be a field falling as

$\dfrac{1}{r^3}$ at large distances outside the toroid.

(d) is pointing radially outwards.

29. A paramagnetic sample shows a net magnetisation of 8 Am⁻¹ when placed in an external magnetic field of 0.6T at a temperature of 4K. When the same sample is placed in an external magnetic field of 0.2 T at a temperature of 16 K, the magnetisation will be

(a) $\dfrac{32}{3}$ Am⁻¹ (b) $\dfrac{2}{3}$ Am⁻¹ (c) 6 Am⁻¹ (d) 2.4 Am⁻¹

30. The output of a step-down transformer is measured to be 24 V when connected to a 12 watt light bulb. The value of the peak current is

(a) $1/\sqrt{2}$ A (b) $\sqrt{2}$ A (c) 2 A (d) $2\sqrt{2}$ A

31. One requires 11eV of energy to dissociate a carbon monoxide molecule into carbon and oxygen atoms. The minimum frequency of the appropriate electromagnetic radiation to achieve the dissociation lies in

(a) visible region (b) infrared region
(c) ultraviolet region (d) microwave region

32. A ray of light incident at an angle θ on a refracting face of a prism emerges from the other face normally. If the angle of the prism is 5° and the prism is made of a material of refractive index 1.5, the angle of incidence is

(a) 7.5° (b) 5° (c) 15° (d) 2.5°

33. An object approaches a convergent lens from the left of the lens with a uniform speed 5 m/s and stops at the focus. The image

(a) moves away from the lens with an uniform speed 5 m/s

(b) moves away from the lens with an uniform accleration

(c) moves away from the lens with a non-uniform acceleration

(d) moves towards the lens with a non-uniform acceleration

34. The wavelength of a photon needed to remove a proton from a nucleus which is bound to the nucleus with 1 MeV energy is nearly

(a) 1.2 nm (b) 1.2×10^{-3} nm
(c) 1.2×10^{-6} nm (d) 1.2×10^{1} nm

35. A proton, a neutron, an electron and an α-particle have same energy. Then their de Broglie wavelengths compare as

(a) $\lambda_p = \lambda_n > \lambda_e > \lambda_\alpha$ (b) $\lambda_\alpha < \lambda_p = \lambda_n < \lambda_e$
(c) $\lambda_e < \lambda_p = \lambda_n < \lambda_\alpha$ (d) $\lambda_e = \lambda_p = \lambda_n = \lambda_\alpha$

36. Taking the Bohr radius as $a_0 = 53$pm, the radius of Li⁺⁺ ion in its ground state, on the basis of Bohr's model, will be about

(a) 53 pm (b) 27 pm (c) 18 pm (d) 13 pm

37. An ideal fluid flows through a pipe of circular cross-section made of two sections with diameters 2.5 cm and 3.75 cm. The ratio of the velocities in the two pipes is

(a) 9 : 4 (b) 3 : 2
(c) $\sqrt{3} : \sqrt{2}$ (d) $\sqrt{2} : \sqrt{3}$

38. Two spheres each of mass M and radius R/2 are connected with a massless rod of length 2R as shown in the figure. The moment of inertia of the system about an axis passing through the centre of one of the spheres and perpendicular to the rod is :-

(a) $\dfrac{21}{5}$ MR² (b) $\dfrac{2}{5}$ MR²

(c) $\dfrac{5}{2}$ MR² (d) $\dfrac{5}{21}$ MR²

39. A cell of internal resistance 1Ω is connected across a resistor. A voltmeter having variable resistance is used to measure potential difference across resistor. The plot of voltmeter reading V against G is shown. What is value of external resistor R?
(G = Resistance of voltmeter) :-

(a) 5 Ω (b) 4 Ω
(c) 3 Ω (d) can't be determined

40. When a magnet of vibration magnetometer heated then its magnetic moment decreases 36% so that the time period of oscillation is :-
(a) 25% increases (b) 25% decreases
(c) 64% increases (d) 64% decreases

Assertion-Reason

Direction : Read the following questions and choose, if
(A) If both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**.
(B) If both **Assertion** and **Reason** are true but **Reason** is not the correct explanation of **Assertion**.
(C) If **Assertion** is true but **Reason** is false.
(D) If **Assertion** is false but **Reason** is true.
(E) If both **Assertion** and **Reason** are false

41. **Assertion** : The minimum number of vectors of unequal magnitude required to produce zero resultant is three.
Reason : Three vectors of unequal magnitude which can be represented by the three sides of a triangle taken in order, produce zero resultant.
(a) A (b) B (c) C (d) D

42. **Assertion** : A negative acceleration of a body can be associated with a "speeding up" of the body.
Reason : Increase in speed of a moving body independent of its direction of motion.
(a) A (b) B (c) C (d) D

43. **Assertion**: To cross the river in minimum time, swimmer should swimming in perpendicular direction to the water current.
Reason : In this case river flow helps to cross the river.
(a) A (b) B (c) C (d) D

44. **Assertion** : In projectile motion, when horizontal range is n times the maximum height, the angle of projection is given by $\tan \theta = \dfrac{4}{n}$.
Reason : In the case of horizontal projection the vertical velocity increases with time.
(a) A (b) B (c) C (d) D

45. **Assertion** : Animate object can accelerate in the absence of external force.
Reason : Newton's second law is not applicable on animate object.
(a) A (b) B (c) C (d) D

46. **Assertion** : A man who falls from a height on a cement floor receive more injury than when he falls from the same height on a heap of sand.
Reason : The impulse applied by a cement floor is more than the impulse by sand floor.

(a) A (b) B (c) C (d) D

47. **Assertion** : A body of weight 10 N (W) is at rest on an inclined plane $\left(\mu = \dfrac{\sqrt{3}}{2} \right)$ making an angle of 30° with the horizontal. The force of friction acting on it is 5N.
Reason : In above situation, the limiting force of friction is given by $f_{limiting} = \mu W \cos \theta = 7.5$ N.
(a) A (b) B (c) C (d) D

48. **Assertion** : A body can have energy without having momentum.
Reason : A body can have momentum without having mechanical energy.
(a) A (b) B (c) C (d) D

49. **Assertion**: The centre of mass of an electron and proton, when released moves faster towards proton.
Reason : Proton is heavier than electron.
(a) A (b) B (c) C (d) D

50. **Assertion** :- Potentiometer measures correct value of emf of a cell.
Reason :- No current flows through cell at null point of potentiometer.
(a) A (b) B (c) C (d) D

51. **Assertion** : When charges are shared between two parallel plate capacitors, charge of system is conserved but some energy is lost.
Reason : During sharing of charges, some energy is dissipated as heat.
(a) A (b) B (c) C (d) D

52. **Assertion** :- Potential energy is possible only in conservative force field.
Reason :- Potential energy is a relative quantity but K.E. is an absolute quantity.
(a) A (b) B (c) C (d) D

53. **Assertion** :- The electrostatic potential is necessarily zero at a point, where the electric field strength is zero.
Reason :- A charged particle in an electric field will move from higher potential region to lower potential region.
(a) A (b) B (c) C (d) D

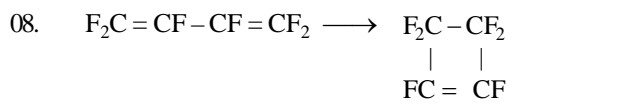54. **Assertion** :- Magnetic field out side the current carrying co–axial cable is zero.
Reason :- Magnetic field due to any current carrying wire, out side it volume always zero.
(a) A (b) B (c) C (d) D

55. **Assertion** :- Whistle of the approaching railway engine is shriller than the receding engine.
Reason :- Apparent frequency of railway engine in both cases is same.
(a) A   (b) B   (c) C   (d) D

56. **Assertion** :- It is not possible to have interference between the waves produced by two violins.
Reason :- For interference of two waves, the phase difference between the waves must depend upon time
(a) A   (b) B   (c) C   (d) D

57. **Assertion** :- On increasing the intensity of light, the number of photoelectrons emitted is more. Also the kinetic energy of each photon increases but the photoelectric current is constant.
Reason :- Photoelectric current is independent of intensity but increases with increasing frequency of incident radiation.
(a) A   (b) B   (c) C   (d) D

58. **Assertion** :- In a SHM, kinetic and potential energies become equal when the displacement is $1/\sqrt{2}$ times the amplitude.
Reason :- In SHM, kinetic energy is zero when potential energy is maximum.
(a) A   (b) B   (c) C   (d) D

59. **Assertion** :- A real gas behaves as an ideal gas at high temperature and low pressure.
Reason :- At low pressure and high temperature intermolecular forces vanish away and volume of gas molecules is negligible.
(a) A   (b) B   (c) C   (d) D

60. **Assertion** :- Nuclear density is almost same for all nuclei.
Reason :- The radius (r) of nucleus depends only on the mass number (A) as $r \propto A^{1/3}$.
(a) A   (b) B   (c) C   (d) D

CHEMISTRY

01. In a solid, oxide ions (O^{2-}) are arranged in ccp, cations (A^{3+}) occupy one-sixth of tetrahedral void and cations (B^{3+}) occupy one-third of the octahedral voids. What is the formula of the compound?
(a) ABO_3 (b) AB_2O_3 (c) A_2BO_3 (d) ABO_2

02. If the radius of Br^- ion is 0.182 nm, how large can a cation be fit in its tetrahedral holes ?
(a) 0.414 pm   (b) 0.0753 nm   (c) 0.091 nm   (d) 0.225 pm

03. Which is not the correct statement for ionic solids in which positive and negative ions are held by strong electrostatic attractive forces ?
(a) The ratio $\dfrac{r^+}{r^-}$ increases as coordination number increases.
(b) As the difference in size of ions increases coordination number increases
(c) When coordination number is eight, the $\dfrac{r^+}{r^-}$ ratio lies between $0.225 - 0.414$
(d) In ionic solid of the type AX (ZnS, Wurtzite) the coordination number of Zn^{2+} and S^{2-} respectively are 4 and 4.

04. When ethyne is passed through a red hot tube, then formation of benzene takes place:
$$\Delta H^o_{f\,(C_2H_2)(g)} = 230\,kJ\,mol^{-1}$$
$$\Delta H^o_{f\,(C_6H_6)(g)} = 85\,kJ\,mol^{-1}$$
Calculate the standard heat of trimerisation of ethyne to benzene.
$$3C_2H_2(g) \longrightarrow C_6H_6(g)$$
(a) 205 kJ mol^{-1} (b) 605 kJ mol^{-1}
(c) –605 kJ mol^{-1} (d) –205 kJ mol^{-1}

05. Given that:
$$2Fe(s) + \frac{3}{2} O_2(g) \longrightarrow Fe_2O_3(s)\ (\Delta H = -193.4\ kJ)\ (i)$$
$$Mg(s) + \frac{1}{2} O_2(g) \longrightarrow MgO(s)\ (\Delta H = -140.2\ kJ)\ (ii)$$
What is ΔH of the reaction ?
$$3Mg + Fe_2O_3 \longrightarrow 3MgO + 2Fe$$
(a) –227.2 kJ   (b) –272.3 kJ
(c) 227.2 kJ   (d) 272.3 kJ

06. Equal volumes of 1 M HCl and 1 M H_2SO_4 are neutralised by 1 M NaOH solution and x and y kJ/equivalent of heat are liberated respectively. Which of the following relations is correct ?
(a) x = 2 y   (b) x = 3 y
(c) x = 4 y   (d) x = $\dfrac{1}{2}$ y

07. Calculate the ΔH in joules for:
$$C(graphite) \longrightarrow C\ (diamond)$$
from the following data:
$C\ (graphite) + O_2(g) \longrightarrow CO_2(g)\ ; \Delta H^o = -393.5\ kJ$
$C(diamond) + O_2(g) \longrightarrow CO_2(g);\ \Delta H^o = -395.4\ kJ$
(a) 1900   (b) -788.9×10^3
(c) 190000   (d) $+788.9 \times 10^3$

08. $F_2C = CF - CF = CF_2 \longrightarrow$

$\begin{array}{cc} F_2C - CF_2 \\ | \quad\quad | \\ FC = CF \end{array}$

For this reaction (ring closure), $\Delta H = -49 \text{ kJ mol}^{-1}$, $\Delta S = -40.2 \text{ J K}^{-1} \text{ mol}^{-1}$. Upto what temperature is the forward reaction spontaneous ?
(a) 1492°C
(b) 1219°C
(c) 946°C
(d) 1080°C

09. For which of the following reactions k_{310}/k_{300} would be maximum ?
(a) $A + B \longrightarrow C$; $\quad E_a = 50 \text{ kJ}$
(b) $X + Y \longrightarrow Z$; $\quad E_a = 40 \text{ kJ}$
(c) $P + Q \longrightarrow R$; $\quad E_a = 60 \text{ kJ}$
(d) $E + F \longrightarrow G$; $\quad E_a = 100 \text{ kJ}$

10. The half-life period of a first order reaction is 1 min 40 seconds. Calculate its rate constant.
(a) $6.93 \times 10^{-3} \text{ min}^{-1}$
(b) $6.93 \times 10^{-3} \text{ sec}^{-1}$
(c) $6.93 \times 10^{-3} \text{ sec}$
(d) $6.93 \times 10^{-3} \text{ min}$.

11. For a reaction $2NH_3 \longrightarrow N_2 + 3H_2$, it is observed that $\dfrac{-d(NH_3)}{dt} = k_1(NH_3)$, $\dfrac{-d(NH_2)}{dt} = k_2(NH_3)$,

$\dfrac{-d(H_2)}{dt} = k_3(NH_3)$. What is the relation between k_1, k_2 and k_3 ?
(a) $k_1 = k_2 = k_3$
(b) $3k_1 = 6k_2 = 2k_3$
(c) $2k_1 = 3k_2 = 6k_3$
(d) $6k_1 = 3k_2 = 2k_3$

12. For a reaction between A and B, the initial rate of reaction is measured for various initial concentrations of A and B. The data provided are:

Exp. No.	[A]	[B]	Initial reaction rate (mol L^{-1}s^{-1})
1.	0.2 M	0.3 M	5×10^{-5}
2.	0.2 M	0.1 M	5×10^{-5}
3.	0.4 M	0.05 M	7.5×10^{-5}

The overall order of the reaction is:
(a) one (1)
(b) two (2)
(c) two and a half (2.5)
(d) between 1 and 2

13. For a first order reaction $k = 10^{-4} \text{ sec}^{-1}$, the time of $\dfrac{1}{4}$ th life will be:
(a) $0.693 \times 10^4 \text{ sec}$
(b) $1.386 \times 10^4 \text{ sec}$
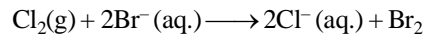(c) $2.303 \times 10^4 \text{ sec}$
(d) $0.301 \times 10^4 \text{ sec}$

14. The time required to coat a metal surface of 80 cm^2 with 5×10^{-3} cm thick layer silver (density 1.05 g/cm^3) by passing a current of 3 amp through silver nitrate solution is:
(a) 115 sec
(b) 125 sec
(c) 135 sec
(d) 145 sec

15. Cost of electricity for the production of x L H$_2$ at NTP at cathode is Rs. x; then cost of production of x L O$_2$ at NTP at anode will be: (assume 1 mole of electrons as one unit of electricity)
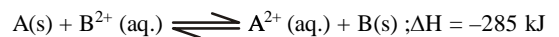(a) 2 x
(b) 4 x
(c) 16 x
(d) 32 x

16. Consider the reaction,
$Cl_2(g) + 2Br^- (aq.) \longrightarrow 2Cl^- (aq.) + Br_2$
The emf of the cell, when $[Cl^-] = [Br_2] = [Br^-] = 0.01$ M and Cl$_2$ gas is at 1 atm pressure, will be: (E° for the above reaction is 0.29 volt)
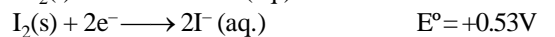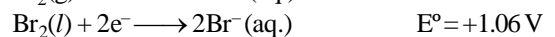(a) 0.54 volt
(b) 0.35 volt
(c) 0.24 volt
(d) – 0.29 volt

17. Efficiency of the following cell is 84%.
$A(s) + B^{2+} (aq.) \rightleftharpoons A^{2+} (aq.) + B(s)$; $\Delta H = -285 \text{ kJ}$
Then the standard electrode potential of the cell will be:
(a) 1.20 V
(b) 2.40 V
(c) 1.10 V
(d) 1.24 V

18. Standard reduction potentials of the half reactions are given below :
$F_2 (g) + 2e^- \longrightarrow 2F^- (aq.)$ $\quad E° = +2.85 \text{ V}$
$Cl_2(g) + 2e^- \longrightarrow 2Cl^- (aq.)$ $\quad E° = +1.36 \text{ V}$
$Br_2(l) + 2e^- \longrightarrow 2Br^- (aq.)$ $\quad E° = +1.06 \text{ V}$
$I_2(s) + 2e^- \longrightarrow 2I^- (aq.)$ $\quad E° = +0.53 \text{V}$
The strongest oxidising and reducing agents respectively are :
(a) F_2 and I^-
(b) Br_2 and Cl^-
(c) Cl_2 and Br^-
(d) Cl_2 and I_2
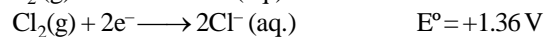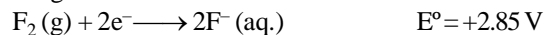
19. Consider the half-cell reduction reaction :
$Mn^{2+} + 2e^- \longrightarrow Mn$; $\quad E° = -1.18 \text{ V}$
$Mn^{2+} \longrightarrow Mn^{3+} + e^-$; $\quad E° = -1.51 \text{ V}$
The E° for the reaction : $3Mn^{2+} \longrightarrow Mn + 2Mn^{3+}$ and possibility of the forward reaction are, respectively:
(a) –2.69 V and no
(b) –4.18 V and yes
(c) +0.33 V and yes
(d) + 2.69 V and no
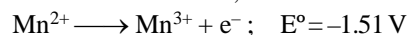
20. Equal volumes of two monoatomic gases A and B, at same temperature and pressure are mixed. The ratio of specific heats (C$_P$/C$_V$) of the mixture will be:
(a) 0.83
(b) 1.50
(c) 3.3
(d) 1.67

21. Which of the following are not linear molecules ?
(a) BeF_2
(b) I_3^-
(c) XeF_2
(d) SF_4

22. Which of the following pair having identical bond order?
(a) NO^+, CO
(b) CN^-, H_2O
(c) O_2^-, O_2^+
(d) CN^+, N_2

23. Which of the following are isostructural ?
    (a) SF_4 and $BeCl_2$
    (b) $BeCl_2$ and I_3^-
    (c) $BeCl_2$ and XeF_4
    (b) SF_4 and SF_6

24. The major product obtained in the following reaction is

DIBAL – H

(a)
(b)
(c)
(d)

25. Which of the following pairs can be distinguished by Hinsberg's test ?
    (a) Benzylamine and benzamide
    (b) Allylamine and propylamine
    (c) p-Toluidine and N-methylaniline
    (d) Cyclohexylamine and aniline

26. The correct order of size for the following ionic species is (highest size first)
    (a) $Na^+ > Mg^{2+} > Cl^{7+} > Si^{4+}$
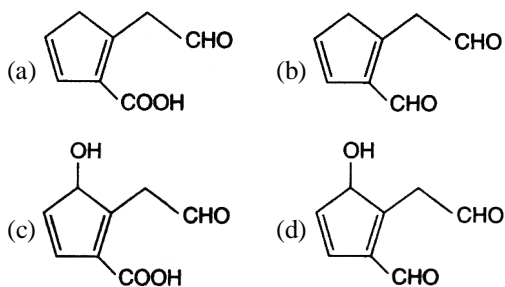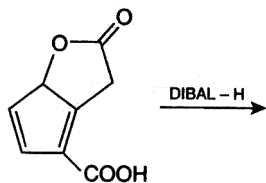   (b) $Cl^{7+} > Na^+ > Mg^{2+} > Si^{4+}$
    (c) $Na^+ > Mg^{2+} > Si^{4+} > Cl^{7+}$
    (d) $Cl^{7+}, Si^{4+} > Mg^{2+} > Na^+$

27. Which of the following process refers to IE_2?
    (a) $X(g) \rightarrow X^{2+}(g)$
    (b) $X^+(aq) \rightarrow X^{2+}(g)$
    (c) $X^+(g) \rightarrow X^{2+}(g)$
    (d) $X(g) \rightarrow X^+(g)$

28. Which of the following is the correct order with respect to indicated property (Not correct)
    (a) $AsH_3 < PH_3 < NH_3$ (bond angle)
    (b) $Mg(OH)_2 < LiOH < NaOH < KOH$ (Basic character)
    (c) $Fe^{3+} < Fe^{2+} < Fe$(size)
    (d) $Mg < Ca < Sr$ (increasing density)

29. Which of the following compounds will form significant amount of meta product during mono-nitration reaction ?

(a) NO_2
(b) OH

(c) NHCOCH$_3$
(d) OCOCH$_3$
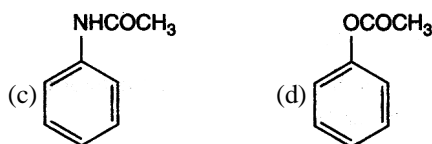
30. Which one of the following compound evolved CO_2 on heating
    (a) Na_2CO_3
    (b) $BaCO_3$
    (c) Rb_2CO_3
    (d) None of these

31. Which one of the following Sulphate gives two acidic gases on heating
    (a) $CuSO_4$
    (b) $FeSO_4$
    (c) $BeSO_4$
    (d) Cs_2SO_4

32. Isopropylamine can not be obtained by
    (a) $(CH_3)_2 = O + NH_2OH \longrightarrow ? \xrightarrow{LiAlH_4}$
    (b) $(CH_3)_2 CO + NH_3 \xrightarrow[\Delta]{Ni/H_4}$
    (c) $(CH_3)_2CH - Br + NaNH_2 \longrightarrow$
    (d) $(CH_3)_2CH - Br \xrightarrow{NaN_3} ? \xrightarrow{LiAlH_3}$

33. Powder of beryllium burns in air frequently to produce
    (a) BeO
    (b) Be_3N_2
    (c) Be_2O
    (d) Both (a) and (b)

34. BeH_2 can be prepared by
    (a) reaction of beryllium with H_2 gas
    (b) reaction of $BeCl_2$ with $LiAlH_4$
    (c) reaction of $BeCl_2$ with H_2
    (d) All of the above

35. If N_b is the number of electrons occupying bonding orbitals and N_a, the number of electrons occupying the antibonding orbitals, then the molecule will be stable if
    (a) $N_b > N_a$
    (b) $N_b < N_a$
    (c) $N_b = N_a$
    (d) $N_b \leq N_a$

36. $-NH_2 \xrightarrow{NaNO_2 + HCl}$ Product

(a) $\oplus Cl^-$
(b) $-OH$
(c) $-Cl$
(d) None of these

37. Most acidic
(a)
(b)
(c) $^{-NH_2}$
(d)

38. Which one of the following gives more faster SN^1 reaction

(a) (b) (c) (d)

39. $\xrightarrow[\text{H}_2\text{O}]{\text{NaBH}_4}$

(a)

(b)

(c) (d) None of these

40. $\xrightarrow[\text{Ether}]{\text{HBr}}$ Product

(a) $+ CH_3Br$ (b) $+ \wedge Br$

(c) $+$ >— (d) $+ CH_3OH$
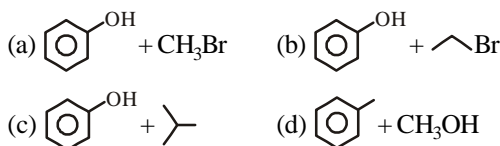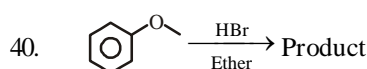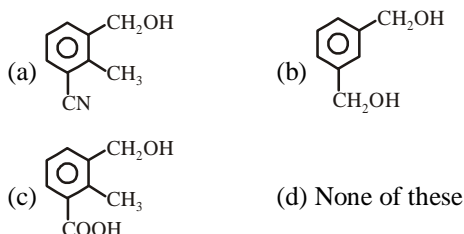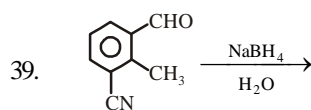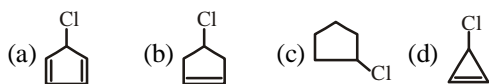
Assertion & Reason
(A) Both **Assertion** and **Reason** are true and **Reason** is the correct explanation of **Assertion**
(B) Both **Assertion** and **Reason** are true but **Reason** is not the correct explanation of **Assertion**
(C) **Assertion** is true but **Reason** is false
(D) Both **Assertion** and **Reason** are false

41. **Assertion** : Molecular solids have low melting point.
Reason : Molecular solids are composed of covalent molecules.
(a)   (b)   (c)   (d)

42. **Assertion** : In ccp arrangement, a tetrahedral void is surrounded by four spheres whereas an octahedral void is surrounded by six spheres.
Reason : Size of tetrahedral void is smaller than that of octahedral void.
(a)   (b)   (c)   (d)

43. **Assertion** : For atomic crystalline solids, the packing efficiency lies in the sequence:
Face-centred cubic > Body-centred cubic > Simple cubic unit cell

Reason : Packing efficiency $= \dfrac{Z \times \frac{4}{3}\pi r^3}{a^3} \times 100$

Where Z = Number of atoms per unit cell
     r = Radius of atom
     a = Edge length of unit cell
(a)   (b)   (c)   (d)

44. **Assertion** : The enthalpy of formation of $H_2O(l)$ is greater than that of $H_2O(g)$.
Reason : Enthalpy change is negative for the condensation reaction
$H_2O(g) \longrightarrow H_2O(l)$
(a)   (b)   (c)   (d)
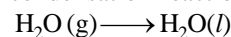
45. **Assertion** : Internal energy change in a cyclic process is zero.
Reason : Internal energy is a state function.
(a)   (b)   (c)   (d)

46. **Assertion** : The thermodynamic factor which determines the spontaneity of a process is the free energy. For a process to be spontaneous the free energy must be –ve
Reason : The change in free energy is related to the change in enthalpy and change in entropy. The change in entropy for a process must always be positive if it is spontaneous
(a)   (b)   (c)   (d)

47. **Assertion** : Work and heat are equivalent forms of energy.
Reason : Work is the transfer of mechanical energy irrespective of temperature difference, whereas heat is the transfer of thermal energy because of temperature difference.
(a)   (b)   (c)   (d)

48. **Assertion** : Positive catalysts increase the rate of reaction.
Reason : Catalysts decrease the value of $\Delta G°$.
(a)   (b)   (c)   (d)

49. **Assertion** : If the activation energy of a reaction is zero, temperature will have no effect on the rate constant.
Reason : Lower the activation energy, faster is the reactioon.
(a)   (b)   (c)   (d)

50. **Assertion** : For the reaction,
$NO_2(g) + CO(g) \longrightarrow CO_2(g) + NO(g)$
$Rate = k[NO_2]^2$
Rate of reaction is independent of concentration of CO.
Reason : The rate does not depend on the concentration of CO because it is involved in the fast step.
(a)   (b)   (c)   (d)
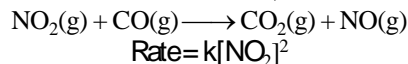
51. **Assertion**: 2-Chlorobutane has higher boiling point than chloroethane.
Reason: Increase in surface area reduces the boiling point.
(a)   (b)   (c)   (d)

52. **Assertion**: C_5H_{12} has three isomers.
    Reason: The isomers are position, chain and functional.
    (a)   (b)   (c)   (d)

53. **Assertion**: Bromobenzene upon reaction with Br_2/Fe gives 1,3-dibromobenzene as the major product.
    Reason: In bromobenzene, the inductive effect of the bromo group is more dominant than the mesomeric effect in directing the incoming electrophile.
    (a)   (b)   (c)   (d)

54. **Assertion**: CH_3CHO reacts with CH_3MgBr followed by hydroxide to yield isopropyl alcohol.
    Reason: It is an organometallic addition reaction.
    (a)   (b)   (c)   (d)

55. **Assertion**: Addition of hydride ion to an aldehyde or ketone produces an alkoxide ion.
    Reason: Alkoxide anion on protonating yields the corresponding alcohol.
    (a)   (b)   (c)   (d)

56. **Assertion** : The compounds of alkaline earth metals are more extensively hydrated than those of alkali metal
    Reason : This is due to low hydration energy of alkaline earth metals as compared to alkali metal
    (a) A   (b) B   (c) C   (d) D

57. **Assertion** : Lithium salts are mostly hydrated
    Reason : Li^+ ions are smaller in size
    (a) A   (b) B   (c) C   (d) D

58. **Assertion** : Ba, Ca and Sr produce individual characteristic colour in flame test
    Reason : The loosely held electrons gets excited from outermost orbit to excited state of orbital
    (a) A   (b) B   (c) C   (d) D

59. **Assertion** : Beryllium is not readily attacked by acid
    Reason : Hydroxide film is formed over surface of the metal
    (a) A   (b) B   (c) C   (d) D

60. **Assertion** : In H_2O molecule, O-atom has two lone pairs of electron
    Reason : The structure of H_2O is tetrahedral due to two sp^3 - hybrid orbitals
    (a) A   (b) B   (c) C   (d) D

BIOLOGY

01. Following are given four statements (i) - (iv) related to frog. Read the statements carefully and select the option that identifies two correct statements:
    (i) The ovaries are situated near kidney and there is no functional connection with kidneys.
    (ii) Vasa efferentia enter the kidneys on their side and open into Bidder's canal.
    (iii) There are twelve pairs of cranial nerves arising from the brain.
    (iv) RBCs are non-nucleated and contain red coloured pigment namely haemoglobin.
    (a) (ii) and (iii)   (b) (i) and (ii)
    (c) (iii) and (iv)   (d) (i) and (iv)

02. Which one of the following, assists in locomotion ?
    (a) Trichocyst in Paramecium
    (b) Clitellum in Pheretima
    (c) Suckers in Hirudinaria
    (d) Antenna in Anopheles

03. Which one of the following is correct regarding the excretion ?
    (a) Large amount of water from renal filtrate is reabsorbed in DCT and a less amount is reabsorbed by PCT
    (b) The desending limb of loop of Henle is completely impermeable to NaCl salt.
    (c) Malpighian corpuscle is found in medulla region of kidney.
    (d) The colour of urine is pale yellow and is slightly alkaline in nature.

04. Intercalated discs Characteristics of muscles, are found in :
    (a) Thigh   (b) Urinary bladder
    (c) Heart   (d) Stomach

05. Which one of the following is the correct matching of the events occurring during menstrual cycle ?
    (a) Menstruation   : Breakdown of myometrium and ovum not fertilised
    (b) Ovulation   : LH and FSH attain peak level and sharp fall in the secretion of progesterone.
    (c) Proliferative   : Rapid regeneration of phase myometrium and maturation of Grafian follicle
    (d) Development of   : Secretory phase and corpus luteum incresed secretion of progesterone.

06. Hysterectomy is surgical removal of :
    (a) Prostate gland   (b) Vas deferens
    (c) Mammary glands   (d) Uterus

07. Pick up the odd one in each series and select correct option:
    (i) Diaphragms, Cervical caps, Vaults, Tubectomy
    (ii) Lippes loop, LNG-20, Implants, Multiload-375
    (iii) Gonorrhoea, Jaundice, Hepatitis-B, Syphilis
    (iv) MTP, ZIFT, GIFT, ICSI
    (v) Saheli, Mala-D, implants, Lactational amenorrhoea

	A	(B)	(C)	(D)	(E)
(a)	Tubectomy	Implants	Jaundice	ICSI	Saheli
(b)	Cervical caps	LNG-20	Syphilis	MTP	Mala-D
(c)	Tubectomy	Implants	Jaundice	MTP	Lactational amenorrhoea
(d)	Vaults	Lippes loop	Hepatitis-B	ZIFT	Lactational amenorrhoea

08. Choose the wrong statement
    (a) Teeth in chondrichthycs are modified ctenoid scales
    (b) Air bladder in fishes regulates buoyancy
    (c) In amphibians, the tympanum represents the ear
    (d) Long bones in birds are pneumatic

09. Which of the following connective tissue often serves as a support framework for epithelium ?
    (a) Areolar tissue   (b) Adipose tissue
    (c) Dense regular connective tissue
    (d) Dense irregular connective tissue

10. Which one of the following statements is correct with respect to digestion in humans
    (a) About 50–60% starch is digested in the mouth
    (b) Salivary amylase breaks starch into maltose in the mouth at an alkaline pH
    (c) About 30% maltose is broken down to glucose in the mouth itself
    (d) One pair each of parotid, sub-maxillary and sublinguals make up salivary glands

11. Given below are four statements, A–D, regarding human blood circulatory system
    (A) Arteries are thick-walled and have narrow lumen as compared to veins
    (B) Angina is acute chest pain when the blood circulation to brain is reduced
    (C) Persons with blood group AB can donate blood to any person with any blood group under ABO system

    (D) Calcium ions play a very important role in blood clotting
    (a) A and B   (b) A and D
    (c) B and C   (d) C and D

12. Which of the following regions of the brain is incorrectly paired with its function?
    (a) Corpus callosum-communication between the left and right cerebral cortices
    (b) Cerebrum-calculation and contemplation
    (c) Medulla oblongata-homeostatic control
    (d) Cerebellum-language comprehension

13. A pregnant female delivers a baby who suffers from stunted growth, mental retardation low intelligence quotient and abnormal skin. This is the result of
    (a) Cancer of the para thyroid gland
    (b) Over secretion of pars distalis
    (c) Deficiency of iodine in diet
    (d) Low secretion of growth hormone

14. Cell of Deiter occurs in
    (a) Retina   (b) Organ of Corti
    (c) Utriculus   (d) Sebaceous glands

15. Probiotics are -
    (a) cancer inducing microbes
    (b) new kind of food allergens
    (c) live microbial food supplement
    (d) safe antibiotics.

16. Pick out the incorrect one about colour blindness:
    (a) This defect is due to mutation in certain genes present in the X chromosome.
    (b) It occurs in about 8 per cent of males and only about 0.4 per cent of females.
    (c) The mother is not herself colour blind because the gene is recessive.
    (d) sex-linked dominant disorder.

17. Which of the following statement is not correct about cancer?
    (a) it cannot create specific immune response in body, because of lack of antigenic substance
    (b) cancerous cells have property of metamorphosis
    (c) monoclonal antibodies can be used to treat cancer
    (d) It is not an infectious disease

18. Which of the following set of disease have common genus of pathogens?
    (a) Tetanus, Botulism
    (b) Typhoid, Cholera
    (c) Diphtheria, Tuberculosis
    (d) Leprosy, Syphilis

19. Which one of the following is an exotic carp species?
    (a) Barbus stigma   (b) Cyprinus carpio
    (c) Labeo bata   (d) Cirrhinus mrigala

20. Intermediate host is absent in the infection of:
    (a) Plasmodium   (b) Trypanosoma
    (c) Entamoeba   (d) Wuchereria

21. The branched sclereids present in hydrophytes are:
    (a) Osteosclereids   (b) Trichosclereids
    (c) Macrosclereids   (d) Astrosclereids

22. Match the following and choose the correct option:
    Column-I   **Column-II**
    A. Cuticle   I. Guard cells
    B. Bulliform cells   II. Outer layer
    C. Stomata   III. Waxy layer
    D. Epidermis   IV. Empty colourless cell
    (a) A-III, B-IV, C-I, D-II   (b) A-I, B-II, C-III, D-IV
    (c) A-III, B-II, C-IV, D-I   (d) A-III, B-II, C-I, D-IV

23. Match the following:
    A. Polyembryony   (i) Fruit formed without
                                 fertilization
    B. Parthenocarpy   (ii) Occurrence of more
                                 than one embryo
    C. Apomixis   (iii) Protoplast fusion
    D. Somatic hybridization (iv) Asexual reproduction
    (a) A-iii, B-iv, C-i, D-ii   (b) A-ii, B-i, C-iv, D-iii
    (c) A-ii, B-i, C-iii, D-iv   (d) A-i, B-iv, C-ii, D-iii

24. Match the column:
    A. XENOGAMY   1. Transfer of pollen grain
                         from anther to stigma of
                         another flower of same
                         plant
    B. AUTOGAMY   2. Transfer of pollen grain
                         from anther to stigma of
                         different plant
    C. CLEISTOGAMY   3. Transfer of pollen grain
                         from anther to stigma of
                         same flower
    D. GEITONOGAMY   4. Flowers are invariably
                         autogamous which do
                         not open at all
    (a) A4, B3, C1, D2   (b) A3, B2, C1, D4
    (c) A2, B3, C4, D1   (d) A1, B3, C4, D2

25. Double fertilization involves:
    (a) Fertilization of the egg by two male gametes
    (b) Fertilization of two eggs in the same embryo sac
    by two sperms brought by one pollen tube
    (c) Fertilization of the egg and the central cell by
    two sperms brought by different pollen tubes
    (d) Fertilization of the egg and the central cell by
    two sperms brough by the same pollen tube

26. Percentage of recombination between A and B 9%,
    A and C is 17% B and C is 26%, the arrangement of
    genes is:
    (a) ABC   (b) ACB
    (c) BCA   (d) BAC

27. Extranuclear genes are occurs in :
    (a) Plastids and are not inherited
    (b) Plasmid and are not inherited
    (c) Mitochondria and are inherited by female
    (d) Mitochondria and are inherited by male

28. The following ratio is generally constant for a given
    species

    (a) $\dfrac{A+G}{C+T}$ (b) $\dfrac{T+C}{G+A}$

    (c) $\dfrac{G+C}{A+T}$ (d) $\dfrac{A+C}{T+G}$

29. The binding site of tRNA with mRNA & amino acids
    respectively are :
    (a) mRNA with DHU loop & amino acid CCA end
    (b) mRNA with CCA end & amino acid are anticodon
    loop
    (c) mRNA with anticodon loop & amt with DHU
    loop
    (d) mRNA with anticodon loop & amt. with CCA
    end

30. Select the correct option

Direction of RNA synthesis	Direction of reading of the template DNA strand
(a) $5'-3'$	$3'-5'$
(b) $3'-5'$	$5'-3'$
(c) $5'-3'$	$5'-3'$
(d) $3'-5'$	$3'-5'$

31. Which of the following rRNAs acts as structural
    RNA as well as ribozyme in bacteria ?
    (a) 23 S rRNA   (b) 5.8 S RNA
    (c) 5 S rRNA   (d) 18 S rRNA

32. A mutation at one base of the first condon, of a
    gene, produces a non-functional protein. Such a
    mutation is called
    (a) nonsense mutation   (b) missense mutation
    (c) frameshift mutation (d) reverse mutation

33. The lac operon consists of
    (a) four regulatory genes only
    (b) one regulatory gene and three structural genes
    (c) two regulatory genes and two structural genes
    (d) three regulatory genes and three structural genes

34. Match column I with II and select the correct option.

Column I	Column II
A. Acid phosphatese	i. Mitochondria
B. Succinate dehydrogenase	ii. chloroplast
C. Glycerol transferase	iii. Lysosome
D. RUBISCO	iv: Golgi body

	A	B	C	D
(a)	i	iii	ii	iv
(b)	iii	ii	i	iv
(c)	iii	i	iv	ii
(d)	iii	i	ii	iv

35. Glycoprotein and glycolipid are the inportant constituents of
(a) Cell Membrane　　(b) Cell wall
(c) Golgi complex　　(d) Desmosomes

36. Select the correct statement from the following :
(i) Massules are the structures found in Golgi complex
(ii) Zone of exclusion in related with mitochondria
(iii) Cell within the cell in true for chloroplast
(iv) Peroxysomes are found in both plant and animal cells.
(a) (i), (ii), (iii)　　(b) (ii), (iii)
(c) (iii), (iv)　　(d) (ii), (iii), (iv)

37. Mycorrhiza is an example of
(a) Key stone species　　(b) Endemic species
(c) Critical link species　　(d) Rare species

38. Which of the following is functional unit of nature
(a) Ecosystem　　(b) Population
(c) Community　　(d) Species

39. In which type of food chain, energy magnitude is high but energy flow slow.
(a) DFC　　(b) GFC
(c) PFC　　(d) Both (b) & (c)

40. According to Euro-II norms the level of sulphur is diesel and petrol respectively is
(a) 150 ppm & 350 ppm　　(b) 350 ppm & 150 ppm
(c) 250 ppm & 350 ppm　　(d) 350 ppm & 250 ppm

Assertion Reason
(A) If both **Assertion** and **Reason** are true and **Reason** is correct explation of **Assertion**.
(B) If both **Assertion** and **Reason** are true but **Reason** is not correct explation of **Assertion**.
(C) If **Assertion** is true but **Reason** is false.
(D) If both **Assertion** and **Reason** are false.

41. **Assertion** : Coelentrates, Ctenophores and Echinoderms have radial symmetry.
Reason : Their body can be divided into two identical left and right halves by only one plane.
(a)　　(b)　　(c)　　(d)

42. **Assertion** : Periodic abstinence is a natural method, where couples abstain from coitus.
Reason : Coitus from day 5 - 10 should be avoided because this is the time of ovulation
(a)　　(b)　　(c)　　(d)

43. **Assertion** : Pregnant woman may show some presence of glucose in their post prandial urine although they have no diabetes.
Reason : In pregnant women the glomerular filtration rate is slightly increased. As a result the tubular load of glucose exceeds the tubular maximum for glucose reabsorption.
(a)　　(b)　　(c)　　(d)

44. **Assertion** : In constipation, the faeces are retained within the rectum.
Reason : In constipation, the bowel movements occur regularly.
(a) A　　(b) B　　(c) C　　(d) D

45. **Assertion** : The valves of the heart (i.e., semilunar and atrio-ventricular valves) prevent any backward flow.
Reason : The valves in the heart allows the flow of blood only in one direction, i.e. from the atria to the ventricles and from ventricles to the pulmonary artery or aorta.
(a) A　　(b) B　　(c) C　　(d) D

46. **Assertion** : In our body cortisol is the main mineralocorticoid.
Reason : Aldosterone help in absorption of minerals from small intestine.
(a) A　　(b) B　　(c) C　　(d) D

47. **Assertion**: Escherichia coli, Shigella sp. and Salmonella sp. are all responsible for diarrhoeal diseases
Reason: Dehydration is common to all types of diarrhoeal diseases and adequate supply of fluids and electrolytes should be ensured.
(a)　　(b)　　(c)　　(d)

48. **Assertion**: Cattle breeds can be improved by superovulation and embryo transplantaion.
**Reason**: Superovulation in high milk-yielding cows is induced by hormonal injection.
(a)　　(b)　　(c)　　(d)

49. **Assertion**: A group of animals related by decent and similar in most characters like general appearance, features, size, configuration, etc, are said to belong to a breed.
Reason: Continued inbreeding reduces fertility and even productivity, this is called inbreeding depression.
(a)   (b)   (c)   (d)

50. **Assertion**: Hisardale is a new breed of sheep developed by cross-breeding.
Reason: Cross breeding allows the desirable qualities of two different breeds to be combined.
(a) A   (b) B   (c) C   (d) D

51. **Assertion** : In woody stems, the amount of heart wood continues to increase year after year
Reason : The tracheary elements of heartwood are plugged by tyloses
(a)   (b)   (c)   (d)

52. **Assertion** : Nuclear endosperm is formed by subsequent nuclear division wall formation.
Reason : Coconut is an example of such endosperm, where the endosperm remains nuclear throughout the development of the fruit.
(a)   (b)   (c)   (d)

53. **Assertion** : In Antirrhuinum incomplete dominance is found.
Reason : Heterozygous red (Rr) flowered plant when crossed with white (rr) flowered plant produces all pink flowered offsprings.
(a)   (b)   (c)   (d)

54. **Assertion** : DNA finger printing help in detection of criminals.
Reason : PCR is used in DNA amplification.
(a)   (b)   (c)   (d)

55. **Assertion** : Amber codon is a termination codon
Reason : If in mRNA, a termination codon is present, the protein synthesis stops abruptly whether the protein synthesis is completed or not.
(a)   (b)   (c)   (d)

56. **Assertion** : One codon may code for more than one amino acid
Reason : A codon can degenerate and is ambiguous
(a)   (b)   (c)   (d)

57. **Assertion** : The collenchyma is a thick walled living tissue
Reason : The collenchyma is thickened parenchyma cell due to the deposition of pectin
(a)   (b)   (c)   (d)

58. **Assertion** : Cell growth results into division.
Reason : Cell growth leads to change in nucleocytoplasmic ratio
(a)   (b)   (c)   (d)

59. **Assertion** : Meiosis Produces four gentically dissimilar cells.
Reason : During Anaphase I disjunction takes place.
(a)   (b)   (c)   (d)

60. **Assertion** : Colombia located near the equator has nearly 1400 bird species while New York at 41° N has 105 species.
Reason : Latitudinal range of 23.5° N to 23.5° S harbour more species than temperate polar area.
(a)   (b)   (c)   (d)

G.K.

01. The world's largest Ice festival has started in
(a) Canada   (b) USA   (c) Australia (d) China

02. Who will be the new chairman of the Indian Space Research Organisation (ISRO) ?
(a) K Radhakrishnan   (b) K Sivan
(c) Narinder Singh Kapany
(d) Amar Gupta

03. What is the theme of the 22nd National Youth Festival?
(a) Youth for United India (b) Lakshya ek Disha
(c) Sankalp Se Siddhi   (d) Youth for Digital India

04. Who has been appointed as the new chairman of Tata Sons ?
(a) Natarajan Chandrashekhran
(b) Yogesh Chander Deveshwar
(c) Indra Nooyi   (d) C.P. Gurnani

05. The Indo - US joint military exercise 'Vajra Prahar 2018' will be held in
(a) Rajasthan   (b) Punjab
(c) Seattle   (d) Florida

06. Which country has build the world's biggest air purifier ?
(a) China   (b) India   (c) U.K.   (d) Japan

07. Who has won the Sir Garfield Sober Trophy for cricketer of the Year 2017 ?
(a) Rohit Sharma   (b) Virat Kohli
(c) Manish Pandey   (d) M.S. Dhoni

08. 58, 52, 46, 40, 34, ...
(a) 46   (b) 52   (c) 28   (d) 30

09. REASON : SFBTPO : : THINK : ?
    (a) NKMPW   (b) UIJOL
    (c) MPOWY   (d) POSTH

10.

```
        9
   ?↖    ↑    ↗3
    5←    →11
   7↙    ↓    ↘7
        19
```
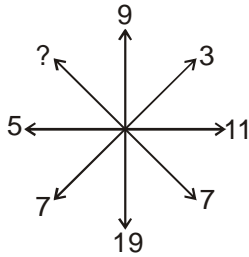
    (a) 18   (b) 30   (c) 20   (d) 15

11. Select the related word/letters/numbers from the given alternatives :
    EFG : VUT : : KLM : ?
    (a) KJH   (b) PON   (c) ZXY   (d) FDC

12. A is mother of B, C is son of A, D is brother of E, E is daughter of B. Who is the grandmother of E ?
    (a) A   (b) B   (c) C   (d) D

13. Where is the Brihadeshwar temple, built during the Chola period, located ?
    (a) Mysore   (b) Mahabalipuram
    (c) Tanjavur   (d) Kanyakumari

14. Recently who becomes first Indian woman wrestler to sign with WWE ?
    (a) Sakshi Malik   (b) Vinesh Phogat
    (c) Kavita Devi   (d) Babita Kumari

15. Which team has won Asia Cup Hockey title, after defeating Malaysia in the finals ?
    (a) India   (b) Pakistan
    (c) Bangladesh   (d) Japan

16. When United Nations Day is observed ?
    (a) 22nd October   (b) 21st October
    (c) 24th October   (d) 25th October

17. Which among the following, new service has been launched between Ghogha and Dahej ?
    (a) Godavari Ferry   (b) RO RO Ferry
    (c) Thevera Ferry   (d) Tapti Ferry

18. Which state is going to the first big state to use EVMs with VVPAT ?
    (a) Gujarat   (b) Himachal Pradesh
    (c) Rajasthan   (d) Delhi

19. The first bullet train in India will be run from
    (a) Mumbai to New Delhi
    (b) Mumbai to Ahmedabad
    (c) New Delhi to Chennai (d) New Delhi to Varanasi

20. The exact point where the earthquake actually originates deep inside the earth's crust is called as
    (a) epicentre   (b) seismic zone
    (c) focus   (d) hyperpoint

****

ANSWER

Physics

01. c	02. b	03. a	04. b	05. c	06. c	07. b	08. b	09. a	10. d
11. a	12. d	13. a	14. b	15. d	16. d	17. c	18. d	19. a	20. b
21. c	22. b	23. d	24. d	25. c	26. d	27. a	28. c	29. b	30. a
31. c	32. a	33. c	34. b	35. b	36. c	37. a	38. a	39. a	40. a
41. b	42. c	43. c	44. b	45. a	46. c	47. b	48. b	49. d	50. a
51. a	52. c	53. d	54. d	55. c	56. c	57. d	58. b	59. a	60. a

Chemistry

01. a	02. b	03. c	04. c	05. a	06. d	07. a	08. c	09. d	10. b
11. c	12. d	13. b	14. b	15. a	16. b	17. d	18. a	19. a	20. d
21. d	22. a	23. b	24. c	25. c	26. c	27. c	28. d	29. a	30. b
31. b	32. c	33. d	34. b	35. a	36. a	37. a	38. d	39. a	40. a
41. a	42. b	43. a	44. a	45. a	46. c	47. a	48. c	49. b	50. a
51. c	52. c	53. d	54. a	55. b	56. c	57. a	58. a	59. c	60. c

Biology

01. b	02. c	03. b	04. c	05. d	06. d	07. c	08. a	09. a	10. d
11. b	12. d	13. c	14. b	15. c	16. d	17. b	18. a	19. b	20. c
21. d	22. a	23. b	24. c	25. d	26. d	27. c	28. c	29. d	30. a
31. a	32. a	33. b	34. c	35. a	36. c	37. a	38. a	39. a	40. b
41. c	42. c	43. a	44. c	45. a	46. d	47. b	48. a	49. a	50. b
51. b	52. c	53. c	54. a	55. b	56. d	57. a	58. a	59. b	60. a

G.K.

01. d	02. b	03. c	04. a	05. c	06. a	07. b	08. c	09. b	10. d
11. b	12. a	13. b	14. c	15. a	16. c	17. b	18. a	19. b	20. c