Monthly Progessive Test (Solution)

Class: XII

Subject: PCMB

Academic Excellence Programme TECHNO ACE

Test Booklet No.: MPT02 | Test Date: 10052024

Physics

1. Ⓑ

$W = Q\,\Delta V$

$\frac{ML^2}{T^2} = AT[V]$

$[V] = ML^2A^{-1}T^{-3}$

2. Ⓐ

$1\text{ eV} = 1.6 \times 10^{-19}\text{ J}$

$1\text{ J} = \frac{1}{1.6} \times 10^{19}\text{ eV} = \frac{10}{16} \times 10^{19} = \frac{100}{16} \times 10^{18} = 6.25 \times 10^{18}\text{ eV} = 0.625 \times 10^{19}\text{ eV}$

3. Ⓒ

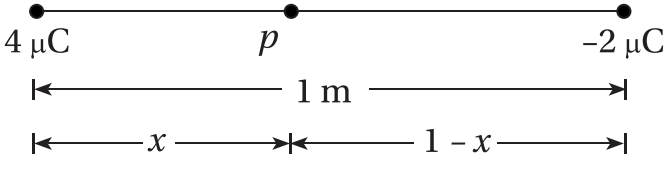
$W = Q\,\Delta V$

$0.5 = (-0.5)\,\Delta V \quad \Rightarrow \Delta V = -1\text{ V}$

4. Ⓐ

$U = \frac{kq^2}{r} - \frac{kq^2}{r} - \frac{kq^2}{r} = (-)\frac{kq^2}{r}$

5. Ⓐ



$k \cdot \frac{4\,\mu\text{C}}{x} - \frac{2\,\mu\text{C}}{1-x} \cdot k = 0 \quad \Rightarrow \frac{4}{x} = \frac{2}{1-x} \quad \Rightarrow 4 - 4x = 2x \quad \Rightarrow 4 = 6x \quad \Rightarrow x = \frac{2}{3}\text{ m}$

6. Ⓐ

$Q = C_0 V$ $\qquad$ $U_1 = \frac{1}{2} C_0 V^2$

$kQ = (kC_0)V$ $\qquad$ $U_2 = \frac{1}{2} kC_0 V^2 = kU_1$

7. Ⓑ

$U = \frac{1}{2} C(2V)^2 = 4 \cdot \frac{1}{2} CV^2 \qquad \therefore \; x = 4$

8. Ⓐ

$E = -\frac{dV}{dx} \qquad \therefore E = 0$

9. Ⓑ

$V_A - V_B = -kQ\left[\frac{1}{OA} - \frac{1}{OB}\right] \Rightarrow (-) \times \text{positive} \Rightarrow -\text{ve}$ $\qquad$ As, $OA < OB \quad \therefore \frac{1}{OA} > \frac{1}{OB}$

10. Ⓒ

False

11. Ⓓ

$W = 0$ $\qquad$ as $\Delta V = 0$

12. Ⓓ

0 Volt. as $k\left[\frac{q}{r} - \frac{q}{r}\right] = 0$

13. Ⓑ

$1 + 2 + 3 = 6\ \mu\text{F}$

14. Ⓒ

$\frac{1 \times 2}{1 + 2} = \frac{2}{3}\ \mu\text{F} = 0.66\ \mu\text{F}$

15. Ⓑ

$\frac{QV}{2} = \frac{0.1 \times 100}{2} = 5\ \text{J}$

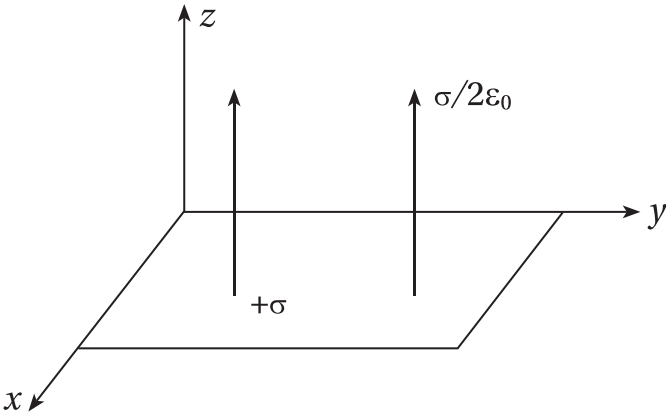
16. Ⓓ

$q_1 \rightarrow +\text{ve}$ $\qquad$ $q_2 \rightarrow -\text{ve}$

$\frac{|q_1|}{|q_2|} = \frac{12}{6} = 2$

17. Ⓓ

18. Ⓐ



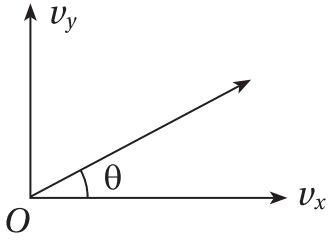
$$W = \left(\frac{q\sigma}{2\varepsilon_0}\hat{k}\right)\cdot a(6-3)\hat{k} = \frac{3\sigma aq}{2\varepsilon_0}$$

19. Ⓑ

$$a_y = \frac{eE}{m}(\uparrow) = \frac{\cancel{e}}{\cancel{m}}\cdot\left(\frac{8\ \cancel{m}}{\cancel{e}} = 8\ \text{m/s}^2\right)$$

$$t \times v_x = 1\ \text{m} \quad \Rightarrow t \times 2 = 1 \quad \therefore t = \frac{1}{2}\ \text{s}$$

$$v_y = a_y \cdot t = 8 \times \frac{1}{2} = 4\ \text{m/s}$$



$$\tan\theta = \frac{v_y}{v_x} = \frac{4}{2} = 2 \quad \Rightarrow \theta = \tan^{-1}(2)$$

20. Ⓐ

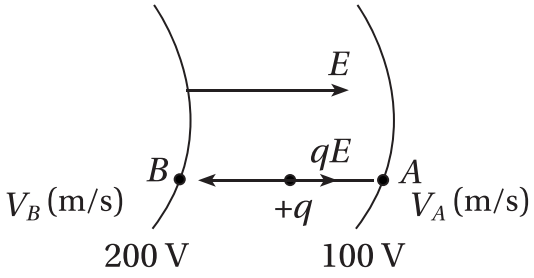
$$E \propto \frac{1}{r^2}$$

21. Ⓑ

$$W_{A\to B} = (\pm q)(V_B - V_A)$$

$KE \rightarrow$ Kinetic Energy

$$kE_B - kE_A = (q)\,(200-100)$$



given: $V_A\,(\text{m/s}) > V_B\,(\text{m/s})$

$\therefore$ q should be positive

$$q = \frac{10}{100} = 0.1\ \text{C}$$

22. Ⓓ

$$U = 9\times10^{9}\,\frac{(7\times10^{-6})(-2\times10^{-6})}{18\times10^{-2}} = -10^{9}\times10^{-12}\times10^{2}\times7 = -7\times10^{-1} = -0.7\ \text{J}$$

23. Ⓓ

$$E = \frac{V}{r} \quad \Rightarrow 30 = \frac{15}{r} \qquad r = 0.5\ \text{m}$$

24. Ⓒ

$$V_{\text{com}} = \frac{C_1V_1 + C_2V_2}{C_1 + C_2} = \frac{CV + 2CV}{2C} = \frac{3\cancel{C}V}{2\cancel{C}} = 1.5\ V$$

25. Ⓒ

Remains same as no source of charge is present.

Chemistry

26. Ⓒ

$4\text{A} + x\text{B} \longrightarrow 2\text{C} + 5\text{D}$

$$\therefore \quad -\frac{1}{4}\frac{d[\text{A}]}{dt} = -\frac{1}{x}\frac{d[\text{B}]}{dt}$$

$$\therefore \quad \frac{4.8\times10^{-3}}{4} = \frac{3.6\times10^{-3}}{x}$$

$\therefore$ $x = 3$

27. Ⓓ

Threshold energy = (25 + 40 + 20) = 85 kJ

28. Ⓑ

Rate = $k.[A]^{\frac{1}{2}}[B]^{\frac{1}{2}}[C]^{\frac{1}{4}}$

$\therefore$ Order = (0.5 + 0.5 + 0.25) = 1.25

29. Ⓐ

Rate = k.[A].[B]

When volume of the vessel becomes one forth then concentration becomes 4 times.

$(rate)_1 = k\cdot[4A]\cdot[4B]$

$\therefore$ $(rate)_1 = 16\cdot k\cdot[A]\cdot[B]$

$\therefore$ $(rate)_1 = 16\cdot[rate]$

30. Ⓒ

Half life = 10 min

So, in this time, concentration becomes half of the original.

Now, in 20 min, concentration becomes $\frac{0.02}{0.08} = \frac{1}{4}$th

From the data it is clear that $t_{50\%} = \frac{t_{75\%}}{2}$

It is a first order reaction and hence the unit of reaction rate constant is $(time)^{-1}$

31. Ⓓ

Molecularity of a reaction is always a positive whole number. It can never be zero or negetive or fraction

32. Ⓒ

Catalyst can change the reaction rate constent value but cannot change the equilibrium constant of a reaction

33. Ⓒ

$$\frac{2}{3}A_2 + \frac{1}{2}B_2 \longrightarrow \frac{5}{4}C_2$$

$$\therefore \text{ rate} = \frac{4}{5}\frac{d[C_2]}{dt} = -\frac{3}{2}\frac{d[A_2]}{dt} = -2\frac{d[B_2]}{dt}$$

34. Ⓑ

$$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$$

$$-\frac{d[CH_4]}{dt} = +\frac{1}{2}\frac{d[H_2O]}{dt}$$

$$\therefore \quad 4.82\times10^{-5} = \frac{1}{2}\frac{d[H_2O]}{dt}$$

$$\frac{d[H_2O]}{dt} = 9.64\times10^{-5}$$

35. (B)

$3A \longrightarrow 2B$

$$\therefore \quad -\frac{1}{3}\frac{d[A]}{dt} = +\frac{1}{2}\frac{d[B]}{dt}$$

$$\therefore \quad \frac{d[B]}{dt} = -\frac{2}{3}\frac{d[A]}{dt}$$

36. (C)

$A + 2B \longrightarrow$ products

$\therefore$ Rate $= k\cdot[A][B]^2$

$\therefore$ $(1.2\times10^3) = k\cdot(0.12).(0.3)^2$

$$\therefore \quad k = \frac{\left(1.2\times10^3\right)}{(0.12)\times(0.3)^2} = 1.11\times10^5$$

37. (C)

$$k = \frac{2.303}{t}\log_{10}^{\frac{1}{0.25}} = \frac{2.303}{4}\log_{10}^{4} = 3.465\times10^{-2}\ \text{min}^{-1}$$

38. (D)

Rate $= k.[X][Y][Z]$

$\therefore$ Order $= (1 + 1 + 1) = 3$

Rate $= k.[X]^{0.5}[Y]^{0.5}[Z]^{0.5}$

$\therefore$ Order $= (0.5 + 0.5 + 0.5) = 1.5$

Rate $= k.[X][Y]^{-2}[Z]^0$

$\therefore$ Order $= (1 - 2 + 0) = -1$

Rate $= k.[X]^{1.5}[Y]^{-1}[Z]^0$

$\therefore$ order $= (1.5 - 1 + 0) = 0.5$

39. Ⓑ

$3A \longrightarrow$ products

Now, $(rate)_1 = k.[2A]^3 = 8k.[A]^3 = 8.(rate)$

40. Ⓑ

Rate $= k.[A]^2[B]$

Now, $(rate)_1 = k.[3A]^2\left[\frac{B}{2}\right] = 4.5k.[A]^2[B] = (4.5).(rate)$

41. Ⓐ

All molecules are considered as spherical in collision theory

42. Ⓐ

$$k = A.e^{-\frac{E_a}{RT}}$$

So, activation energy is associated only with reaction rate constant, not with the equilibrium constant

43. Ⓐ

For zero order reaction,

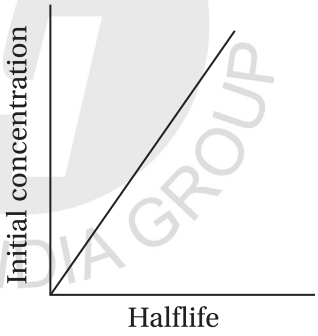
$[X_0 - X] = k.t$

at halflife, $t = t_{50\%}$ then $X = \frac{X_o}{2}$

$\therefore \quad \left[X_o - \frac{X_o}{2}\right] = k.t_{50\%}$

$\therefore \quad \frac{X_o}{2} = k.t_{50\%}$

$\therefore \quad X_0 = 2k.t_{50\%}$



44. Ⓒ

rate $= k.[X]^2$

$11 \times 10^{-8} = k.[0.2]^n$ .....(i)

$2.25 \times 10^{-8} = k.[0.1]^n$ ..... (ii)

Dividing equation (i) by equation (ii)

$4 = 2^n$

$\therefore n = 2$

45. Ⓐ

$$t_{50\%} \; \alpha \; \frac{1}{X_o^2}$$

It is an equation of third order reaction

as, $t_{50\%} \alpha \frac{1}{(\text{initial concentration})^{n-1}}$ [n = order of the recation]

Now, for third order reaction, the correct equations are

$3A \longrightarrow$ products

$$\frac{1}{2}\left[\frac{1}{X^2} - \frac{1}{X_o^2}\right] = k.t$$

$$-\frac{dx}{dt} \alpha (X)^3$$

46. Ⓐ

Instantaneous rate of reaction is a very small quantity and represented by a point on the line. Now, one tangent touches a curve at only one point.

47. Ⓒ

Unit of rate constant is $mol.L^{-1}.sec^{-1}$ when concentration of the reactants is considered and for gaseous reactants pressure is considered. Then the unit of reaction rate constant is $atm.sec^{-1}$. So, it is evident that reaction rate constant depends on the nature of the reactants.

In case of reaction rate constant unit determination, the inverse of the unit of time is multiplied with the unit of concentration of reactants.

48. Ⓑ

Any radioactive decay generates smaller element with respect to the parent element and this decay follows first order kinetics. Thus halflife does not depend on initial concentration.

49. Ⓒ

$$t_{50\%} \alpha \frac{1}{(X_o)^{n-1}}$$

For second order reaction, the equation becomes $t_{50\%} \alpha \frac{1}{X_o}$

50. Ⓒ

At higher temperature, the number of effective collisions increase. Hence, the rate of reaction increases.

51. Ⓑ

$(A - A^t)^t = A^t - A = -(A - A^t)$

$= A - A^t$ is skew-symmetric

52. Ⓑ

$A^t = A$ and $A^t = -A \Rightarrow A = -A^t$

$\Rightarrow 2A = A^t + (-A^t) = 0 \Rightarrow A = 0$

53. Ⓐ

A is an orthogonal matrix.

$\therefore A^tA = \mathrm{I}$

Again, $A^{-1}A = I \quad \therefore A^t = A^{-1}$

54. Ⓑ

$$A = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$$

55. Ⓐ

$$A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$$

$$A^2 = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$A^4 = A^2 \times A^2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

56. Ⓒ

$AA^{-1} = I \Rightarrow \det(AA^{-1}) = \det(I)$

$\Rightarrow \det(A)\det(A^{-1}) = 1$

$\Rightarrow \det(A^{-1}) = \dfrac{1}{|A|}$

57. Ⓑ

$$A=\begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix} \Rightarrow |A| = \begin{vmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{vmatrix} = a^3$$

$$A \times \text{adj } A = |A| I_3 \Rightarrow |A \times \text{adj } A| = |A|^3$$

$$\Rightarrow |A| \times |\text{adj } A| = |A|^3$$

$$\Rightarrow |\text{adj } A| = |A|^2 = a^6$$

58. Ⓓ

$$\begin{vmatrix} 1-x & 2 & 3 \\ 0 & 2-x & 0 \\ 0 & 2 & 3-x \end{vmatrix} = 0$$

$$\Rightarrow (1-x)(2-x)(3-x) = 0$$

$$\Rightarrow x = 1, 2, 3$$

59. Ⓑ

$$\begin{vmatrix} 1 & 1 & 1 \\ 4 & 3 & 2 \\ 4^2 & 3^2 & 2^2 \end{vmatrix} = \begin{vmatrix} 0 & 0 & 1 \\ 2 & 1 & 2 \\ 12 & 5 & 4 \end{vmatrix} = 10 - 12 = -2$$

60. Ⓐ

B is non-singular matrix

$\therefore |B| \neq 0$

$$|B^{-1}AB| = |B^{-1}||A||B|$$

$$= |B^{-1}||B||A|$$

$$= |B^{-1}B||A|$$

$$= |I||A|$$

$$= |A|$$

61. Ⓒ

$$A=\begin{bmatrix} 2 & -3 \\ -4 & 1 \end{bmatrix}$$

$$A^2 = \begin{bmatrix} 2 & -3 \\ -4 & 1 \end{bmatrix}\begin{bmatrix} 2 & -3 \\ -4 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 16 & -9 \\ -12 & 13 \end{bmatrix}$$

$$(3A^2+12A)=\begin{bmatrix}48 & -27\\ -36 & 39\end{bmatrix}+\begin{bmatrix}24 & -36\\ -48 & 12\end{bmatrix}$$

$$=\begin{bmatrix}72 & -63\\ -84 & 51\end{bmatrix}$$

$$adj\,(3A^2+12A)=adj\begin{bmatrix}72 & -63\\ -84 & 51\end{bmatrix}$$

$$=\begin{bmatrix}51 & -63\\ -84 & 72\end{bmatrix}$$

62. ©

$$Q=\begin{bmatrix}\cos\frac{\pi}{4} & -\sin\frac{\pi}{4}\\ \sin\frac{\pi}{4} & \cos\frac{\pi}{4}\end{bmatrix}=\begin{bmatrix}\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}}\end{bmatrix}$$

$$Q^2=\begin{bmatrix}\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}}\end{bmatrix}\begin{bmatrix}\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}}\end{bmatrix}$$

$$=\begin{bmatrix}0 & -1\\ 1 & 0\end{bmatrix}$$

$$Q^3=\begin{bmatrix}0 & -1\\ 1 & 0\end{bmatrix}\begin{bmatrix}\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}}\end{bmatrix}$$

$$=\begin{bmatrix}-\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\end{bmatrix}$$

$$Q^3X=\begin{bmatrix}-\frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}}\end{bmatrix}\begin{bmatrix}\frac{1}{\sqrt{2}}\\ \frac{1}{\sqrt{2}}\end{bmatrix}$$

$$=\begin{bmatrix}-1\\ 0\end{bmatrix}$$

63. Ⓐ

$$A=\begin{bmatrix}1 & 2 & x\\ 3 & -1 & 2\end{bmatrix},\ B=\begin{bmatrix}y\\ x\\ 1\end{bmatrix},\ AB=\begin{bmatrix}6\\ 8\end{bmatrix}$$

$$AB=\begin{bmatrix}1 & 2 & x\\ 3 & -1 & 2\end{bmatrix}\begin{bmatrix}y\\ x\\ 1\end{bmatrix}=\begin{bmatrix}y+3x\\ 3y-x+2\end{bmatrix}$$

$$\begin{bmatrix}y+3x\\ 3y-x+2\end{bmatrix}=\begin{bmatrix}6\\ 8\end{bmatrix}\Rightarrow \begin{matrix}y+3x=6\\ 3y-x+2=8\end{matrix}$$

$$\Rightarrow \begin{matrix}y+3x=6\\ 3y-x=6\end{matrix}$$

$$\Rightarrow y+3x=3y-x$$

$$\Rightarrow 4x=2y$$

$$\Rightarrow 2x=y$$

64. Ⓑ

$$BB^T=(A^{-1}A^T)(A^{-1}A^T)^T$$
$$=(A^{-1}A^T)(A)(A^{-1})^T$$
$$=A^{-1}AA^T(A^T)^{-1}$$
$$=A^{-1}AI$$
$$=A^{-1}A$$
$$=I$$

65. Ⓒ

$$A=\begin{bmatrix}5 & 5\alpha & \alpha\\ 0 & \alpha & 5\alpha\\ 0 & 0 & 5\end{bmatrix}$$

$$|A|=\begin{vmatrix}5 & 5\alpha & \alpha\\ 0 & \alpha & 5\alpha\\ 0 & 0 & 5\end{vmatrix}=5\times 5\alpha=25\alpha$$

$$|A^2|=|A|^2=625\alpha^2$$

$$\therefore 625\alpha^2=25\Rightarrow \alpha^2=\frac{1}{25}\Rightarrow |\alpha|=\frac{1}{5}$$

66. Ⓒ

$$\sin^{-1}\frac{x}{5}+\operatorname{cosec}^{-1}\frac{5}{4}=\frac{\pi}{2}$$

$$\Rightarrow \sin^{-1}\frac{x}{5}=\frac{\pi}{2}-\sin^{-1}\frac{4}{5}=\cos^{-1}\frac{4}{5}=\sin^{-1}\frac{3}{5}$$

$$\Rightarrow \quad \frac{x}{5}=\frac{3}{5} \Rightarrow x=3$$

67. ©

$$=\cos^{-1}\left(-\sin\frac{7\pi}{6}\right)$$

$$=\cos^{-1}\left[-\left(-\sin\frac{\pi}{6}\right)\right]$$

$$=\cos^{-1}\left(\sin\frac{\pi}{6}\right)$$

$$=\cos^{-1}\left(\cos\frac{\pi}{3}\right)=\frac{\pi}{3}$$

68. ©

$$=\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{2}=\tan^{-1}\left(\frac{\frac{1}{3}+\frac{1}{2}}{1-\frac{1}{3}\times\frac{1}{2}}\right)$$

$$=\tan^{-1}\left(\frac{\frac{5}{6}}{\frac{5}{6}}\right)=\tan^{-1}(1)$$

$$=\frac{\pi}{4}$$

69. Ⓓ

$(1, 1) \notin R$, $(2, 2) \notin R$, $(3, 3) \notin R$, $(4, 4) \notin R$

$\therefore$ Not reflexive

$(1, 3) \notin R$, $(3, 1) \notin R$ but $(1, 1) \notin R$

$\therefore$ Not transitive

$(2, 3) \notin R$ but $(3, 2) \notin R$

$\therefore$ Not symmetric

70. Ⓑ

$$y=\sqrt{(x-1)(3-x)}$$

$\Rightarrow\ y^2 = 3x - x^2 - 3 + x$

$\Rightarrow\ x^2 - 4x + y^2 = -3$

$\Rightarrow\ (x-2)^2 + y^2 = 1$

which represents a circle having centre (2, 0) and radius 1.

$\Rightarrow$ Range = [0, 1]

71. Ⓓ

Order of $A = 3 \times m = 3 \times n \quad (\because m = n)$

Order of $B = 3 \times n$

$\therefore$ Order of matrix $(5A - 2B) = 3 \times n$

72. Ⓒ

$$A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$$

$$A^T = \begin{bmatrix} 0 & x & x \\ 2y & y & -y \\ z & -z & z \end{bmatrix}$$

$$A^T A = \begin{bmatrix} 0 & x & x \\ 2y & y & -y \\ z & -z & z \end{bmatrix}\begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$$

$$= \begin{bmatrix} 2x^2 & 0 & 0 \\ 0 & 6y^2 & 0 \\ 0 & 0 & 3z^2 \end{bmatrix}$$

$A^T A = I$

$$\Rightarrow \begin{bmatrix} 2x^2 & 0 & 0 \\ 0 & 6y^2 & 0 \\ 0 & 0 & 3z^2 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

$\Rightarrow\ 2x^2 = 1, \quad 6y^2 = 1, \quad 3z^2 = 1$

$\Rightarrow\ x = \pm\frac{1}{\sqrt{2}},\ y = \pm\frac{1}{\sqrt{6}},\ z = \pm\frac{1}{\sqrt{3}}$

73. Ⓒ

$$A=\begin{bmatrix} K & 8 \\ 4 & 2K \end{bmatrix}$$

$$|A|=0 \Rightarrow \begin{vmatrix} K & 8 \\ 4 & 2K \end{vmatrix}=0$$

$$\Rightarrow 2K^2-32=0$$

$$\Rightarrow K^2=16$$

$$\Rightarrow K=\pm 4$$

74. Ⓑ

$$\text{Area of triangle} = \frac{1}{2}\begin{vmatrix} -3 & 0 & 1 \\ 3 & 0 & 1 \\ 0 & K & 1 \end{vmatrix} \text{sq. units}$$

$$=\frac{1}{2}\times 6K \text{ sq. units}$$

$$=3K \text{ sq. units}$$

$$\therefore\ 3K=9 \quad = \quad K=3$$

75. Ⓐ

$$A=\begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix} \Rightarrow |A|=\begin{vmatrix} \alpha & 2 \\ 2 & \alpha \end{vmatrix}=\alpha^2-4$$

$$|A^2|=25 \Rightarrow |A|^2=25$$

$$\Rightarrow (\alpha^2-4)^2=25$$

$$\Rightarrow \alpha^2-4=5$$

$$\Rightarrow \alpha^2=9$$

$$\Rightarrow \alpha=\pm 3$$

Biology

76. Ⓐ

Saccharomyces cerevisiae

77. Ⓓ

Activated sludge treatment

Its a part of secondary treatment.

78. Ⓑ

Population crash

79. Ⓑ

Weekly

80. Ⓐ

1 to 3

81. Ⓓ

Tip

Pointed end of the head of a sperm.

82. Ⓐ

Shock

83. Ⓒ

Parturition

84. Ⓒ

Leydig cells

85. Ⓒ

Middle piece

86. Ⓑ

Menarche

87. Ⓑ

Phagocytosis of sperms

88. Ⓐ

ART

89. Ⓒ

Integrated pest management programme

90. Ⓓ

Fungi

91. Ⓑ

Pectocellular

92. Ⓑ

Perisperm

93. Ⓐ

8-nucleate and 7-celled

The central cell contains 2 polar nuclei.

94. Ⓒ

Prevent self pollination

Removal of stamens makes the flowers unisexual.

95. Ⓓ

Parthenocarpy

Seedless fruits

96. Ⓑ

Cryptorchidism

97. Ⓑ

Ampulla

98. Ⓐ

Amniocentesis

Method of foetal sex determination.

99. Ⓒ

Hepatitis A

Hepatitis A is a water or food borne disease.

100. Ⓑ

clot buster