PHYSICS

1. If $A = 3\hat{i} + 4\hat{j}$ and $B = 7\hat{i} + 24\hat{j}$, the vector having the same magnitude of B and parallel to A is

(1) $5\hat{i} + 20\hat{j}$ (2) $15\hat{i} + 10\hat{j}$

(3) $20\hat{i} + 15\hat{j}$ (4) $15\hat{i} + 20\hat{j}$

2. Given vector $\vec{A} = 2\hat{i} + 3\hat{j}$, the angle between $\vec{A}$ and y-axis is

(1) $\tan^{-1} 3/2$ (2) $\tan^{-1} 2/3$

(3) $\sin^{-1} 2/3$ (4) $\cos^{-1} 2/3$

3. Maximum and minimum magnitudes of the resultant of two vectors of magnitudes P and Q are in the ratio 3 : 1. Which of the following relations is true

(1) P = 2Q (2) P = Q

(3) PQ = 1 (4) None of these

4. Which pair of the following forces will never give resultant force of 2N

(1) 2 N and 2 N (2) 1 N and 1 N

(3) 1 N and 3 N (4) 1 N and 4 N

5. If two vectors $2\hat{i} + 3\hat{j} - \hat{k}$ and $-4\hat{i} - 6\hat{j} + \lambda\hat{k}$ are parallel to each other then value of λ be

(1) 0 (2) 2

(3) 3 (4) 4

6. A person moves 30 metres North, then 20 metres East, then $30\sqrt{2}$ metres South West. His displacement from the original position is

(1) 14 metres South West

(2) 28 metres South

(3) 10 metres West

(4) 15 metres East

7. If the resultant of the two vectors having magnitude of 7 and 4 is 11, the dot product of the two vectors could be

(1) 28 (2) 3

(3) Zero (4) $\frac{7}{4}$

8. Consider a vector $\vec{F} = (4\vec{i} - 3\vec{j})$. Another vector is perpendicular of $\vec{F}$ is

(1) $7\hat{k}$ (2) $6\hat{i}$

(3) $(4\hat{i} + 3\hat{j})$ (4) $(3\hat{i} - 4\hat{j})$

9. Two vectors $\vec{A}$ and $\vec{B}$ are such that $\vec{A}+\vec{B}=\vec{C}$ and $A^2+B^2=C^2$. If θ is the angle between positive directions of $\vec{A}$ and $\vec{B}$ then mark the correct alternative

(1) $\theta = 0°$ (2) $\theta = \frac{\pi}{2}$

(3) $\theta = \frac{2\pi}{3}$ (4) $\theta = \pi$

10. The magnitudes of the X and Y components of $\vec{P}$ are 7 and 6. Also the magnitudes of X and Y components of $\vec{P} + \vec{Q}$ are 11 and 9 respectively. What is the magnitude of Q ?

(1) 5 (2) 6

(3) 8 (4) 9

11. Given : $\vec{A} = 2\hat{i} - \hat{j} + 2\hat{k}$ and $\vec{B} = -\hat{i} - \hat{j} + \hat{k}$. The unit vector of $\vec{A} - \vec{B}$ is

(1) $\frac{3\hat{i} + \hat{k}}{\sqrt{10}}$ (2) $\frac{3\hat{i}}{\sqrt{10}}$

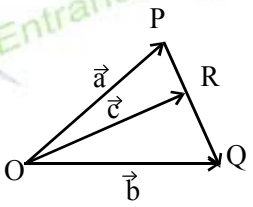
(3) $\frac{\hat{k}}{\sqrt{10}}$ (4) $\frac{-3\hat{i} - \hat{k}}{\sqrt{10}}$

12. Two vectors $\vec{a}$ and $\vec{b}$ are at an angle of 60° with each other. Their resultant makes an angle of 45° with $\vec{a}$. If $|\vec{b}| = 2$ units, then $|\vec{a}|$ is

(1) $\sqrt{3}$ (2) $\sqrt{3} - 1$

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

13. Figure shows three vectors $\vec{a}, \vec{b}$ and $\vec{c}$, where R is the midpoint of PQ. Then which of the following relations is correct ?



(1) $\vec{a} + \vec{b} = 2\vec{c}$

(2) $\vec{a} + \vec{b} = \vec{c}$

(3) $\vec{a} - \vec{b} = 2\vec{c}$

(4) $\vec{a} - \vec{b} = \vec{c}$

14. Consider the following statements about three vectors $\vec{a}, \vec{b}$ and $\vec{c}$ that have been non-zero magnitudes

I. If $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c}$, it following that $\vec{b} = \vec{c}$

II. $\vec{a} \times \vec{b} = \vec{a} \times \vec{c} = 0$, b must be perpendicular to $\vec{c}$

Which of these statements is /are correct ?

(1) I only (2) II only

(3) I and II both (4) Neither I nor II

15. A particle has position vector ($3\hat{i} - \hat{j} + 2\hat{k}$) metre at time t=0. It moves with constant velocity ($-\hat{i} - \hat{j} + 3\hat{k}$) m s^{-1}. The position vector (in m) of the particle after 3 second is

(1) $-4\hat{j} + 11\hat{k}$ (2) $2\hat{i} - \hat{k}$

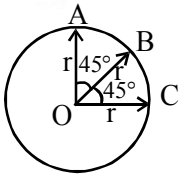
(3) $\hat{j}$ (4) $3\hat{k}$

16. The component of vector $\vec{A} = 2\hat{i} + 3\hat{j}$ along the vector $\hat{i} + \hat{j}$ is

(1) $\frac{5}{\sqrt{2}}$ (2) $10\sqrt{2}$

(3) $5\sqrt{2}$ (4) 5

17. The resultant of the three vectors $\vec{OA}$, $\vec{OB}$ and $\vec{OC}$ shown in figure.



(1) r (2) 2r

(3) r $(1+\sqrt{2})$ (4) r $(\sqrt{2}-1)$

18. Vector $\vec{A}$ is 2 cm long and is 60° above the x-axis in the first quadrant. Vector $\vec{B}$ is 2 cm long and is 60° below the x-axis in the fourth quadrant. The sum $\vec{A} + \vec{B}$ is a vector of magnitude

(1) 2 along + y-axis (2) 2 along + x-axis

(3) 1 along – x-axis (4) 2 along – x-axis

19. Two forces P and Q acting at a point are such that if P is reversed, the direction of the resultant is turned through 90°. Then

(1) P = Q (2) P = 2Q

(3) $P = \frac{Q}{2}$

(4) No relation between P and Q

20. The resultant of two forces, one double the other in magnitude, is perpendicular to the smaller of the two forces. The angle between the two forces is

(1) 120° (2) 60°

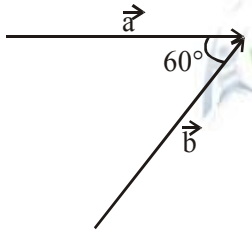
(3) 90° (4) 150°

21. If $\vec{c} = \vec{a} + \vec{b}$, $|\vec{a}| = 3$ unit, $|\vec{b}| = 4$ unit and angle between $\vec{a}$ and $\vec{b}$ is 90°, then, $|\vec{c}|$ is

(1) 7 unit (2) 5 unit

(3) 10 unit (4) Zero

22. Figure represents two vectors $\vec{a}$ and $\vec{b}$, such that $\vec{c} = \vec{a} + \vec{b}$. If $|\vec{a}| = |\vec{b}| = 5$ unit then, $|\vec{c}|$ is



(1) 5 unit (2) 10 unit

(3) $5\sqrt{3}$ unit (4) None of these

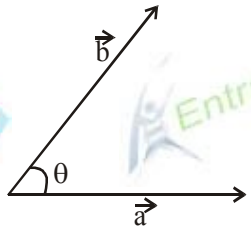
23. If $\vec{a}$ is rotated through an angle 60° keeping its tail fixed such that in new position we get $\vec{b}$. Then which of the following is correct ?

(1) $\vec{b} = \vec{a}$ (2) $|\vec{b}| = |\vec{a}|$ but $\vec{b} \neq \vec{c}$

(3) $\vec{b} \neq \vec{c}$ but directions of two are same

(4) None of these

24. For figure shown $\vec{c} = \vec{a} + \vec{b}$ and angle that $\vec{c}$ makes with $\vec{b}$ is α then which of the following is correct ?



(1) $\tan\alpha = \frac{b\sin\theta}{a + b\cos\theta}$ (2) $\tan\alpha = \frac{b\cos\theta}{a - b\sin\theta}$

(3) $\tan\alpha = \frac{a\sin\theta}{a + b\cos\theta}$ (4) $\tan\alpha = \frac{a\sin\theta}{b + a\cos\theta}$

25. If $\vec{c} = \vec{a} + \vec{b}$, a = 10 unit, b = 5 unit, then which of the following may be magnitude of $\vec{c}$?

(1) 10 unit (2) 20 unit

(3) 3 unit (4) 25 unit

26. If $|\vec{a}+\vec{b}|=|\vec{a}-\vec{b}|, a\neq 0, b\neq 0$, then angle between $\vec{a}$ and $\vec{b}$ is
(1) 45° (2) 60°
(3) 90° (4) 120°

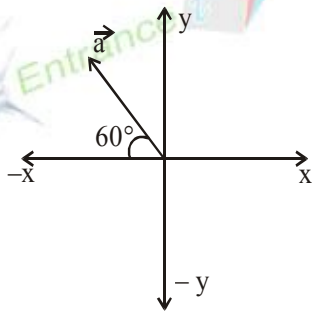
27. A ball was moving towards east with velocity 5m/s. The ball collided with a wall then its velocity become 5 m/s towards north, then magnitude of change in velocity of ball is
(1) 5 m/s (2) $5\sqrt{2}$ m/s
(3) Zero (4) 10 m/s

28. If $\vec{c}=\vec{a}+\vec{b}, |\vec{a}|=|\vec{b}|=|\vec{c}|$, then angle between $\vec{c}$ and $\vec{a}$ is
(1) 120° (2) 60°
(3) 90° (4) 45°

29. If $\vec{c}=\vec{a}-\vec{b}, |\vec{a}|=|\vec{b}|$ = 10 unit and angle between $\vec{a}$ and $\vec{b}$ is 60°, then $|\vec{c}|$ is
(1) 10 unit (2) $10\sqrt{2}$ unit
(3) $10\sqrt{3}$ unit (4) Zero

30. If $\vec{c}=\vec{a}+\vec{b}$, then which of the following is correct ?
(1) $|\vec{c}|>|\vec{a}|+|\vec{b}|$
(2) $|\vec{c}|<|\vec{a}|-|\vec{b}|$
(3) $|\vec{a}|+|\vec{b}|\geq|\vec{c}|\geq||\vec{a}|-|\vec{b}||$
(4) $|\vec{c}|=|\vec{a}|+|\vec{b}|$ always

31. For figure shown $\vec{a}=a_x\hat{i}+a_y\hat{j}, |\vec{a}|$ = 10 unit, then



(1) $a_x = 5, a_y = 5\sqrt{3}$ (2) $a_x = -5, a_y = -5\sqrt{3}$
(3) $a_x = -5, a_y = 5\sqrt{3}$ (4) $a_x = -10, a_y = 10$

32. If $\vec{a}=-5\hat{i}-5\hat{j}$ and θ is angle that $\vec{a}$ makes anticlockwise with positive direction of x-axis, then θ is
(1) 45° (2) 135°
(3) 315° (4) 225°

33. If $\vec{c}=3\hat{i}+4\hat{j}+5\hat{k}$, then $|\vec{c}|$ is
(1) 50 unit (2) 25 unit
(3) $5\sqrt{2}$ unit (4) None of these

34. If $\vec{c}$ makes angle α, β and γ with x, y & z axes respectively, then which of the following is correct ?
(1) $\cos^2\alpha+\cos^2\beta+\cos^2\gamma=1$
(2) $\cos^2\alpha\times\cos^2\beta\times\cos^2\gamma=1$
(3) $\cos\alpha+\cos\beta+\cos\gamma=1$
(4) $(1+\cos^2\alpha)+(1+\cos^2\beta)+(1+\cos^2\gamma)=0$

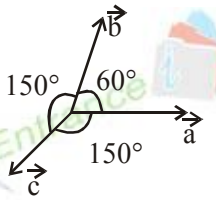
35. If $\vec{c}=3\hat{i}+4\hat{j}+5\hat{k}$ and $\vec{c}=|\vec{c}|\hat{n}$, then $\hat{n}$ is
(1) $\frac{3}{5}\hat{i}+\frac{4}{5}\hat{j}+\hat{k}$
(2) $\frac{3}{5\sqrt{2}}\hat{i}+\frac{4}{5\sqrt{2}}\hat{j}+\frac{1}{\sqrt{2}}\hat{k}$
(3) $\frac{3}{10}\hat{i}+\frac{4}{10}\hat{j}+\frac{1}{10}\hat{k}$ (4) $\frac{1}{5}\hat{i}+\frac{4}{15}\hat{j}+\frac{1}{3}\hat{k}$

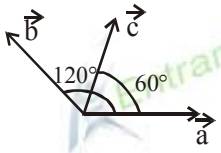
36. If $\vec{c}=\hat{i}+\hat{j}+\hat{k}$ and angle that $\vec{c}$ makes with x, y & z-axes are α, β and γ respectively then which of the following is correct ?
(1) $\cos\alpha=\cos\beta=\cos\gamma=\frac{1}{\sqrt{3}}$
(2) $\cos\alpha=\cos\beta=\cos\gamma=\frac{1}{3}$
(3) $\cos\alpha=\cos\beta=\cos\gamma=-\frac{1}{3}$
(4) $\sin\alpha=\sin\beta=\sin\gamma=\frac{1}{\sqrt{3}}$

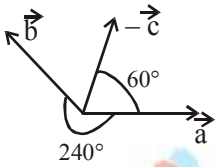
37. If $|\vec{a}+\vec{b}|=|\vec{a}-\vec{b}|, |\vec{a}|=|\vec{b}|$, then angle between $(\vec{a}+\vec{b})$ and $(\vec{a}-\vec{b})$ is
(1) 120° (2) 90°
(3) 45° (4) 60°

38. If $\vec{c}=|\vec{c}|\hat{n}$ then $\hat{n}$, has
(1) Units of $\vec{c}$
(2) Dimension of $\vec{c}$
(3) Units and dimension both of $\vec{c}$
(4) Neither unit nor dimension

39. If $\vec{a}+\vec{b}+\vec{c}=\vec{0}$, $|\vec{a}|=|\vec{b}|=|\vec{c}|$, then which of the following is correct figure

(1) 

(2) 

(3) 

(4) None of these

40. A room has dimension 5m × 3m × 4m. A mosquito files from one corner of the room to its diagonally opposite corner, then magnitude of displacement of mosquito is

(1) 5 m (2) $5\sqrt{2}$ m

(3) 4 m (4) 3 m

41. If $\vec{a}=2\hat{i}+3\hat{j}-4\hat{k}$ and $\vec{b}=3\hat{i}+2\hat{j}+z\hat{k}$. The value of z for which $\vec{a}$ is perpendicular to $\vec{b}$ is

(1) 3 (2) –3

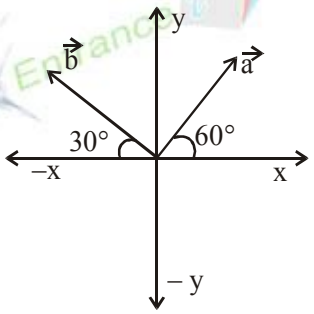
(3) 1 (4) –1

42. Under the action of force $\vec{F}=3\hat{i}+2\hat{j}+3\hat{k}$ N displacement of a particle is $\vec{S}=2\hat{i}+4\hat{j}-2\hat{k}$ m, then work done by force is

(1) 8J (2) 10J

(3) 20J (4) 5J

43. Figure represents $\vec{a}$ and $\vec{b}$ such that $|\vec{a}|=|\vec{b}|$, then $\vec{a}.\vec{b}$ is



(1) a^2 (2) a^2+2a

(3) Zero (4) 2a

44. If $\vec{a}$ and $\vec{b}$ are two vectors then $\frac{(\vec{a}.\vec{b})\vec{a}}{a^2}$ represents

(1) Vector component of $\vec{b}$ in the direction of $\vec{a}$

(2) Vector component of $\vec{a}$ in the direction of $\vec{b}$

(3) Vector component of $\vec{b}$ perpendicular to $\vec{a}$

(4) None of these

45. If $\vec{c}=\vec{a}+\vec{b}$, $|\vec{a}|=|\vec{b}|=10$ unit, & $\vec{a}$ is perpendicular to $\vec{b}$, then $\vec{c}.\vec{a}$ is

(1) 10 units (2) 100 units

(3) 20 units (4) 200 units

46. If $\vec{a},\vec{b}$ & $\vec{c}$ are mutually perpendicular vectors such that $\vec{c}=\vec{a}\times\vec{b}$. If direction of $\vec{a}$ is vertically upward and direction of $\vec{c}$ is towards west then direction of $\vec{b}$ is towards

(1) South (2) East

(3) West (4) North

47. If $\vec{a}$ and $\vec{b}$ are two vectors in x-y plane then which of the following will always be along z-axis ?

(1) $\vec{a}+\vec{b}$ (2) $\vec{a}-\vec{b}$

(3) $\vec{b}-\vec{a}$ (4) $\vec{a}\times\vec{b}$

48. A force $\vec{F}=2\hat{i}+3\hat{j}$ N acts at a point P (4m, 2m) in x-y plane then magnitude moment of force about origin of co-odinate system is

(1) 14 Nm

(2) 8 Nm

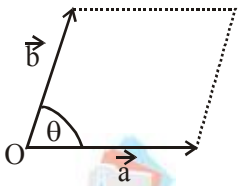
(3) 12 Nm (4) Zero

49. If $\vec{a}$ and $\vec{b}$ two vectors such that $\vec{c}=\vec{a}+\vec{b}$ and $\vec{p}=\vec{a}\times\vec{b}$, then $\vec{c}.\vec{p}$ is

(1) 1 (2) Zero

(3) $\frac{ab}{2}$ (4) a^2+b^2

50. Figure represents a paralleogram determined by $\vec{a}$ & $\vec{b}$, then area of parallelogram is given by



(1) $\vec{a}.\vec{b}$ (2) $|\vec{a}+\vec{b}|$

(3) $|\vec{a}\times\vec{b}|$ (4) $|\vec{a}-\vec{b}|$

CHEMISTRY

51. The number of electrons lost or gained during reaction $3Fe + 4H_2O \longrightarrow Fe_3O_4 + 4H_2$ is
(1) 2 (2) 4
(3) 6 (4) 8

52. The oxidation number of carbon is CH_3COOH is
(1) +4 (2) +3 , –3
(3) +3 (4) +1

53. Which of the following reactions involves neither oxidation nor reduction
(1) $CrO_4^{2-} \longrightarrow Cr_2O_7^{2-}$
(2) $Cr \longrightarrow CrCl_3$
(3) $VO^{2+} \longrightarrow V_2O_2$
(4) $2S_2O_3^{2-} \longrightarrow S_4O_6^{2-}$

54. A, B and C are three element forming a part of compound in oxidation states of +2, +5 and –2 respectively. What could be the compound
(1) $A_2(BC)_2$ (2) $A_2(BC_4)_3$
(3) $A_3(BC_4)_2$ (4) ABC

55. In which of the following reactions there is no change in the oxidation number?
(1) $HNO_3 + 2H_2SO_4 \rightarrow NO_2^+ + H_3O^+ + 2HSO_4^-$
(2) $2KNH_2 + N_2O \rightarrow KN_3 + KOH + NH_3$
(3) $2N_2O_4 + 2KI \rightarrow 2KNO_3 + 2NO + I_2$
(4) $6K_3[Fe(CN)_6] + Cr_2O_3 + 10KOH \rightarrow 6K_4[Fe(CN)_6] + 2K_2CrO_4 + 5H_2O$

56. The equivalent weight of $Na_2S_2O_3$ in the reaction $2Na_2S_2O_3 + I_2 \rightarrow Na_2S_4O_6 + 2NaI$
(1) $\frac{M}{2}$ (2) $\frac{M}{4}$
(3) M (4) $\frac{M}{5}$

57. $x\,Cl_2 + yOH^- \rightarrow ClO_3^- + Cl^- + H_2O$
(1) x = 3, y = 6 (2) x = 2, y = 4
(3) x = 1, y = 4 (4) None of these

58. Which one of the following statements is not correct?
(1) Oxidation number of S in $(NH_4)_2S_2O_8$ is +6
(2) Oxidation number of Os in OsO_4 is +8
(3) Oxidation number of S in H_2SO_4 is +8
(4) Oxidation number of O in BaO_2 is –1

59. In the balanced chemical reaction,
$IO_3^- + aI^- + bH^+ \rightarrow cH_2O + dI_2$
a, b, c and d respectively correspond to
(1) 5, 6, 3, 3 (2) 5, 3, 6, 3
(3) 3, 5, 3, 6 (4) 5, 6, 5, 5

60. One mole of N_2H_4 loses 10 mol of electrons to form a new compound Y. Assuming that all nitrogen appear in the new compound, what is the oxidation state of N_2 in Y? (There is no change in the oxidation state of hydrogen)
(1) +3 (2) –3
(3) –1 (4) +5

61. The compound which could not act both as oxidising as well as reducing agent is
(1) SO_2 (2) MnO_2
(3) Al_2O_3 (4) CrO

62. How many moles of $K_2Cr_2O_7$ in acidic medium can be reduced by 1 mole of Sn^{2+} ?
(1) 1/3 (2) 1/6
(3) 2/3 (4) 1

63. What is the oxidation state of sulphur in $Na_2S_4O_6$?
(1) +6 (2) +5
(3) +4 (4) +2.5

64. Which of the following is an example of disproportionation reaction?
(1) $Cl_2 \longrightarrow Cl^- + ClO_3^-$
(2) $KClO_3 \longrightarrow KCl + KClO_4$
(3) $IO_3^- + I^- \longrightarrow I_2$
(4) All of these

65. Oxidation state of Cr in CrO_5 will be
(1) +6 (2) +10
(3) +5 (4) +3

66. The equivalent massof FeS_2 whose molecular mass is M is _____ in following reaction
$FeS_2 \rightarrow Fe^{3+} + SO_3$
(1) $\frac{M}{11}$ (2) $\frac{M}{7}$
(3) $\frac{M}{1}$ (4) $\frac{M}{15}$

67. Equivalent weight of ferous oxalate, (M = molarmass) when it reacts with $KMnO_4$ in acidic medium will be

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

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

68. Oxidation no. of each Nitrogen in NH_4NO_3 will be

(1) +3 (2) +5

(3) –3 (4) Both (2) and (3)

69. What are the values of x, y and z (respectively) in the following redox reaction

$$xFeSO_4 + yKMnO_4 + zH_2SO_4 \longrightarrow aMnSO_4 + 5Fe_2(SO_4)_3 + K_2SO_4 + dH_2O$$

(1) 5, 2 and 8 (2) 10, 2 and 8

(3) 10, 1 and 4 (4) 10, 1 and 8

70. $KMnO_4$ oxidises oxalic acid in acidic medium. the number of CO_2 molecules produced as per the balanced equation is

(1) 10 (2) 8

(3) 6 (4) 3

71. The number of mole of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is

(1) 2/5 (2) 3/5

(3) 4/5 (4) 1

72. HNO_3 oxidises NH_4^+ ions to nitrogen and itself gets reduced to NO_2. The moles of HNO_3 required by 1 mole of $(NH_4)_2SO_4$ is -

(1) 4 (2) 5

(3) 6 (4) 2

73. In nitric oxide (NO), the oxidation state of nitrogen is:

(1) –2 (2) +1

(3) –1 (4) +2

74. The number of moles of $KMnO_4$ reduced by one mole of KI in alkaline medium is -

(1) One fifth (2) Five

(3) One (4) Two

75. For decolourization of 1 mole of $KMnO_4$, the moles of H_2O_2 required is -

(1) 1/2 (2) 3/2

(3) 5/2 (4) 7/2

76. Which of the following can behave as only oxidising agent ?

(1) HNO_3 (2) H_2SO_3

(3) CrO_2 (4) SO_2

77. What mass of N_2H_4 can be oxidized to N_2 by 24.0 gm of K_2CrO_4. Which is reduced to $Cr(OH)_4^-$? (At. mass of Cr = 52)

(1) 2.969 gm (2) 5.25 gm

(3) 9.08 gm (4) 29.69 gm

78. A compound of Xe and F is found to have 53.3% Xe. Oxidation number of Xe in this compound is :

(1) –4 (2) zero

(3) +4 (4) +6

79. $Cr_2O_7^{2-} + 14H^+ + he^- \longrightarrow 2Cr^{3+} + 7H_2$; The value of n in the above equation is

(1) 2 (2) 3

(3) 4 (4) 6

80. The number of moles of $KMnO_4/H^+$ required to oxidise 2 mole of FeC_2O_4 is

(1) 1.2 (2) 2

(3) 5 (4) 3

81. In alkaline medium $KMnO_4$ acts as oxidising agent, its equivalent mass will be (molecular mass of $KMnO_4$ = 158)

(1) 158 (2) 31.6

(3) 52.6 (4) 15.8

82. The equivalent mass of $MnSO_4$ is half its molecular mass when it is converted to

(1) Mn_2O_3 (2) MnO_2

(3) MnO_4^- (4) MnO_4^{2-}

83. The oxidation number is different in two similar elements is

(1) $Ca(O\overset{*}{Cl})\overset{*}{Cl}$ (2) $H_2\overset{**}{S}_2O_8$

(3) $H_2\overset{**}{S}_2O_7$ (4) $\overset{**}{S}_2O_6^{2-}$

84. A solution of 10 ml $\frac{M}{10}$ $FeSO_4$ was treated with $KMnO_4$ solution in acidic medium; the amount of $KMnO_4$ used will be

(1) 10 ml 0.5 M (2) 10 ml 0.1 M

(3) 10 ml 0.02 M (4) 5 ml 0.1 M

85. According to the following equation,

$K_2Cr_2O_7 + 4H_2SO_4 \rightarrow K2SO_4+Cr_2(SO_4)_3+4H_2O+3[O]$

the equivalent mass of $K_2Cr_2O_7$ is

(1) mol. mass / 3 (2) mol. mass / 6

(3) mol. mass (4) mol. mass / 12

86. When $KMnO_4$ is reduced with oxalic acid in acidic medium, the oxidation number of Mn changes from :

(1) 7 to 4 (2) 6 to 4

(3) 7 to 2 (4) 4 to 2

87. For the half cell reaction,

$2BrO_3^- + 12H^+ + 10e \longrightarrow Br_2 + 6H_2O$

the equivalent mass of sodium bromate is:

(1) Equal to its mol. mass

(2) 1/3 of its mol. mass

(3) 1/6 of its mol. mass

(4) 1/5 of its mol. mass

88. In alkaline conditions, $KMnO_4$ reacts as follows

$2KMnO_4 + 2KOH \longrightarrow 2K_2MnO_4 + H_2O + [O]$

Therefore, its equivalent mass will be :

(1) 31.6 (2) 52.7

(3) 72.0 (4) 158.0

89. The equivalent mass of $(NH_4)_2Cr_2O_7$ will be _____ in following reaction

$(NH_4)_2Cr_2O_7 \rightarrow N_2 + Cr^{3+} + H_2O$

(1) $\frac{M}{3}$ (2) $\frac{M}{6}$

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

90. Weight of iodine required to oxidise 500 mL $Na_2S_2O_3$ solution, is :

(1) 6.35g (2) 63.5g

(3) 127g (4) 254g

91. Which of the following acids is added in the titration of oxalic acid and potassium permanganate ?

(1) HNO_3 (2) HCl

(3) CH_3COOH (4) H_2SO_4

92. 1.0g of a metal carbonate neutralises 200 mL of 0.1 N HCl. The equivalent mass of the metal will be:

(1) 50 (2) 40

(3) 20 (4) 100

93. 1g of a metal required 50 mL of 0.5 N HCl to dissolve it. The equivalent mass of the metal is :

(1) 25 (2) 50

(3) 20 (4) 40

94. The equivalent mass of phosphoric acid (H_3PO_4) is 49. It behaves as .... acid

(1) Monobasic (2) Dibasic

(3) Tribasic (4) Reducing agent

95. In the reaction, $CH_3OH \longrightarrow HCOOH$, the number of electrons that must be added to the right is :

(1) 4 (2) 3

(3) 2 (4) 1

96. The oxidation state of iron in sodium nitroprusside is :

(1) +2 (2) +1

(3) zero (4) +3

97. For the redox reaction

$MnO_4^- + C_2O_4^{2-} + H^+ \longrightarrow Mn^{2+} + CO_2 + H_2O$

the correct coefficients of the reactants for the balanced reaction are :

MnO_4^-	$C_2O_4^{2-}$	H^+
(1) 2	5	16
(2) 16	5	2
(3) 5	16	2
(4) 2	16	5

98. How many moles of e^- are gained in conversion of 2 mole of nitrobenzene into aniline

(1) 6 (2) 12

(3) 3 (4) 5

99. $28NO_3^- + 3As_2S_3 + 4H_2O \rightarrow$

$6AsO_4^{3-} + 28NO + 9SO_4^{2-} + 8H^+$

What will be the equivalent mass of As_2S_3 in above reaction ?

(1) $\frac{M.wt.}{2}$ (2) $\frac{M.wt.}{4}$

(3) $\frac{M.wt.}{24}$ (4) $\frac{M.wt.}{28}$

100. The equivalent weight of KIO_3 in the reaction,

$2Cr(OH)_3 + OH^- + KIO_3 \longrightarrow$

$2CrO_4^{2-} + 5H_2O + KI$ is :

(1) Molecular weight (2) $\frac{\text{Molecular weight}}{3}$

(3) $\frac{\text{Molecular weight}}{6}$ (4) $\frac{\text{Molecular weight}}{2}$