ANSWERS

I. Multiple Choice Questions (Type-I)

1. (ii)	2. (ii)	3. (ii)	4. (iv)	5. (i)	6. (iv)
7. (ii)	8. (i)	9. (iii)	10. (iii)	11. (i)	12. (ii)
13. (iii)	14. (iv)	15. (iii)	16. (iv)	17. (i)	18. (ii)
19. (ii)	20. (iv)	21. (ii)	22. (i)	23. (ii)	24. (iii)
25. (iv)	26. (i)	27. (iii)	28. (iv)	29. (ii)	30. (ii)
31. (iv)	32. (i)	33. (ii)	34. (i)	35. (iv)	36. (i)
37. (i)					

II. Multiple Choice Questions (Type-II)

38. (iii), (iv)	39. (iii), (iv)	40. (iii), (iv)	41. (i), (ii), (iv)
42. (i), (ii)	43. (ii), (iii)	44. (i), (iv)	45. (ii), (iii)
46. (i), (iii)	47. (i), (iii)	48. (i), (iv)	49. (i), (iii)
50. (i), (ii), (iii)	51. (i), (iv)	52. (i), (ii)	53. (ii), (iv)

III. Short Answer Type

54. The liquids and gases have a property to flow i.e. the molecules can move past and tumble over one another freely. Hence, they have been categorised as fluids.

55. The distance between the constituent particles (atoms, ions, molecules etc.) is very less in solids. On bringing them still closer repulsion will start between electron clouds of these particles. Hence, they cannot be brought further close to each other.

56. Crystals have long range repeated pattern of arrangement of constitutent particles but in the process of crystallisation some deviations from the ideal arrangement (i.e. defects) may be introduced, therefore, crystals are usually not perfect.

57. Yellow colour in sodium chloride is due to metal excess defect due to which unpaired electrons occupy anionic sites. These sites are called F-centres. These electrons absorb energy from the visible region for the excitation which makes crystal appear yellow.

58. In the crystals of FeO, some of the Fe^{2+} cations are replaced by Fe^{3+} ions. Three Fe^{2+} ions are replaced by two Fe^{3+} ions to make up for the loss of positive charge. Eventually there would be less amount of metal as compared to stoichiometric proportion.

59. On heating ZnO loses oxygen according to the following reaction.

$$ZnO \xrightarrow{\text{heating}} Zn^{2+} + \frac{1}{2}O_2 + 2e^-$$

Zn^{2+} ions and electrons move to interstitial sites and F-centres are created which impart yellow colour to ZnO(s).

60. The gap between conduction band and valence band is small in semiconductors (Fig. 1.1), therefore, electrons from the valence band can jump to the conduction band on increasing temperature. Thus they become more conducting as the temperature increases.

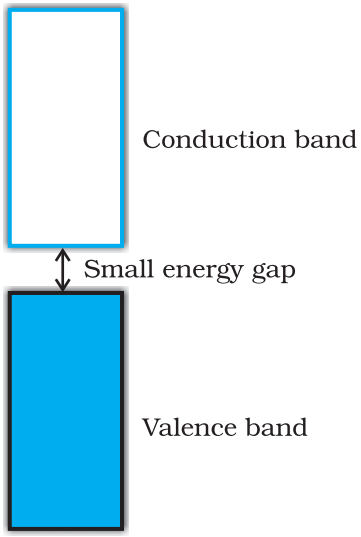

Fig. 1.2 : Semi conductor

61. On doping germanium with galium some of the positions of lattice of germanium are occupied by galium. Galium atom has only three valence electrons. Therefore, fourth valency of nearby germanium atom is not satisfied. The place remains vacant. This place is deficient of electrons and is therefore called electron hole or electron vacancy. Electron from neighbouring atom comes and fills the gap, thereby creating a hole in its original position. Under the influence of electric field electrons move towards positively charged plates through these holes and conduct electricity. The holes appear to move towards negatively charged plates.

62. M_2N_3

63. See page no. 3 of NCERT textbook for Class XII.

IV. Matching Type

64.	(i) → (c)	(ii) → (a)	(iii) → (d)	(iv) → (b)
65.	(i) → (b), (c)	(ii) → (c), (d)	(iii) → (c), (e)	(iv) → (a), (d)
66.	(i) → (c)	(ii) → (a)	(iii) → (b)	
67.	(i) → (d)	(ii) → (c)	(iii) → (b)	(iv) → (a)
68.	(i) → (c)	(ii) → (a)	(iii) → (d)	(iv) → (b)

V. Assertion and Reason Type

69. (i) 70. (ii) 71. (iii) 72. (ii) 73. (iii)

VI. Long Answer Type

74. [**Hint :** Draw structure and discuss]

75. [**Hint :**Draw structure and discuss]

76. See page no. 26 of NCERT textbook for Class XII.

77. Let the formula of sample be

$(Fe^{2+})_x (Fe^{3+})_y O$.

On looking at the given formula of the compound

$x + y = 0.93$ ... (1)

Total positive charge on ferrous and ferric ions should balance the two units of negative charge on oxygen. Therefore,

$2x + 3y = 2$ ... (2)

$\Rightarrow \quad x + \frac{3}{2}y = 1$ ... (3)

On subtracting equation (1) from equation (3) we have

$$\frac{3}{2}y - y = 1 - 0.93$$

$$\Rightarrow \quad \frac{1}{2}y = 0.07$$

$$\Rightarrow \quad y = 0.14$$

On putting the value of y in equation (1) we get,

$x + 0.14 = 0.93$

$\Rightarrow \quad x = 0.93 - 0.14$

$x = 0.79$

Fraction of Fe^{2+} ions present in the sample = $\frac{0.79}{0.93} = 0.81$

Metal deficiency defect is present in the sample because iron is less in amount than that required for stoichiometric composition.