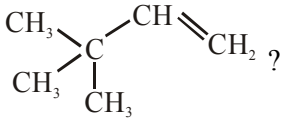
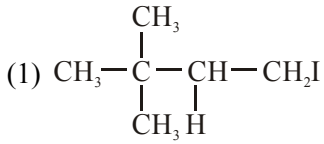
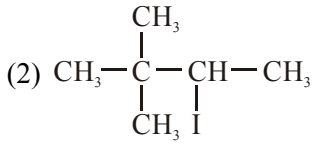
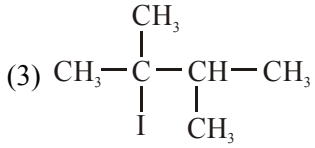
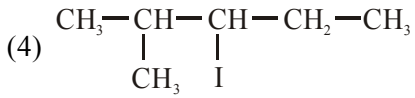
11. What is the major product formed by HI on reaction with  ?

(1) 

(2) 

(3) 

(4) 

12. Which of the following reagent is used for the following reaction ?

$$CH_3CH_2CH_3 \xrightarrow{?} CH_3CH_2CH_2OH$$

(1) Manganese acetate
(2) Copper at high temperature and pressure
(3) Molybdenum oxide
(4) Potassium permanganate

13. Given below are two statements :
Statement I : Colourless cupric metaborate is reduced to cuprous metaborate in a luminous flame.
Statement II : Cuprous metaborate is obtained by heating boric anhydride and copper sulphate in a non-luminous flame.
In the light of the above statements, choose the most appropriate answer from the options given below.
(1) Statement I is true but Statement II is false
(2) Both Statement I and Statement II are false
(3) Statement I is false but Statement II is true
(4) Both Statement I and Statement II are true

14. Out of the following, which type of interaction is responsible for the stabilisation of α-helix structure of proteins ?
(1) Ionic bonding
(2) Hydrogen bonding
(3) Covalent bonding
(4) vander Waals forces

15. Match List I with List II.

List I (Monomer Unit)	**List II (Polymer)**
(a) Caprolactum	(i) Natural rubber
(b) 2-Chloro-1,3-butadiene	(ii) Buna-N
(c) Isoperene	(iii) Nylon 6
(d) Acrylonitrile	(iv) Neoprene

Choose the correct answer from the options given below :
(1) (a) → (i), (b) → (iv), (c) → (iii), (d) → (ii)
(2) (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)
(3) (a) → (iii), (b) → (iv), (c) → (i), (d) → (ii)
(4) (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

16. The gas released during anaerobic degradation of vegetation may lead to :
(1) Ozone hole
(2) Acid rain
(3) Corrosion of metals
(4) Global warming and cancer

17. The major components in "Gun Metal" are :
(1) Cu, Zn and Ni (2) Cu, Sn and Zn
(3) Al, Cu, Mg and Mn (4) Cu, Ni and Fe

18. The electrode potential of M^{2+} / M of 3d-series elements shows positive value of :
(1) Zn (2) Fe (3) Co (4) Cu

6. For the reaction $A_{(g)} \rightarrow (B)_{(g)}$, the value of the equilibrium constant at 300 K and 1 atm is equal to 100.0. The value of $\Delta_r G$ for the reaction at 300 K and 1 atm in J mol^{-1} is $-xR$, where x is _____ (Rounded of to the nearest integer) (R = 8.31 J mol^{-1} K^{-1} and ln 10 = 2.3)

7. A proton and a Li^{3+} nucleus are accelerated by the same potential. If λ_{Li} and λ_P denote the de Broglie wavelengths of Li^{3+} and proton respectively, then the value of $\frac{\lambda_{Li}}{\lambda_P}$ is $x \times 10^{-1}$. The value of x is _____.
(Rounded off to the nearest integer)
(Mass of Li^{3+} = 8.3 mass of proton)

8. The stepwise formation of $[Cu(NH_3)_4]^{2+}$ is given below

$$Cu^{2+} + NH_3 \overset{K_1}{\rightleftharpoons} [Cu(NH_3)]^{2+}$$

$$[Cu(NH_3)]^{2+} + NH_3 \overset{K_2}{\rightleftharpoons} [Cu(NH_3)_2]^{2+}$$

$$[Cu(NH_3)_2]^{2+} + NH_3 \overset{K_3}{\rightleftharpoons} [Cu(NH_3)_3]^{2+}$$

$$[Cu(NH_3)_3]^{2+} + NH_3 \overset{K_4}{\rightleftharpoons} [Cu(NH_3)_4]^{2+}$$

The value of stability constants K_1, K_2, K_3 and K_4 are 10^4, 1.58×10^3, 5×10^2 and 10^2 respectively. The overall equilibrium constants for dissociation of $[Cu(NH_3)_4]^{2+}$ is $x \times 10^{-12}$. The value of x is _____. (Rounded off to the nearest integer)

9. The coordination number of an atom in a body-centered cubic structure is _____.
[Assume that the lattice is made up of atoms.]

10. Gaseous cyclobutene isomerizes to butadiene in a first order process which has a 'k' value of $3.3 \times 10^{-4} s^{-1}$ at 153°C. The time in minutes it takes for the isomerization to proceed 40 % to completion at this temperature is _____. (Rounded off to the nearest integer)