1. Which of the following compound does not contain carboxylic group (—COOH)?
   (a) Acetic acid (b) Lactic acid
   (c) Benzoic acid (d) Picric acid

2. Which of the following compound will not obtain, on the distillation of calcium acetate with calcium formate?
   (a) Acetone (b) Formaldehyde
   (c) Acetaldehyde (d) Propionaldehyde

3. Glucose gives silver mirror test because it contains
   (a) —COOH group (b) a basic group
   (c) a ketonic group (d) an aldehyde group

4. Which compound is used to obtain teflon polymer?
   (a) Difluoro ethane
   (b) Monofluoro ethane
   (c) Tetrafluoro ethene
   (d) Tetrafluoro ethane

5. Which of the following equation shows the de-Broglie relationship?
   (a) $\frac{h}{mv} = p$ (b) $\lambda m = \frac{v}{p}$
   (c) $\lambda = \frac{h}{mp}$ (d) $\lambda = \frac{h}{mv}$

6. Which of the following will the order of energy of subshells related to principal quantum number ($n = 4$)?
   (a) $s < p < d < f$ (b) $s < d < p < f$
   (c) $s < f < p < d$ (d) $p < s < d < f$

7. The electron shell is not spherical in, which of the following element?
   (a) He (b) Be
   (c) B (d) Li

8. The correct electronic configuration of iron is
   (a) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^6$
   (b) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^5$
   (c) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^7$
   (d) $1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^1, 3d^5$

9. According to VSEPR theory the geometry of water molecule is
   (a) octahedral
   (b) distorted tetrahedral
   (c) trigonal planar
   (d) trigonal bipyramidal

10. On adding a non-volatile solution in a solvent, the vapour pressure of solvent reduces 10 mm of Hg. The mole fraction of solute is 0.2 in the solution. The vapour pressure of solution reduces to 20 mm of Hg on adding more solute in the solution. Now, what will the mole fraction of solvent in solution?

(a) 0.2 (b) 0.4
(c) 0.6 (d) 0.8

11. Which of the following statement is false for ionic crystals?

(a) The boiling point and melting point of ionic crystals are high.
(b) These dissolves in water and other solvents.
(c) At low temperature, these are conductor of electricity in solid state.
(d) Their cohesive energy is high.

12. 8 g amount of a radioactive substance remains 0.5 g after 1 h. What is its half-life?

(a) 10 min (b) 15 min
(c) 30 min (d) None of these

13. In a radioactive change

$$R \xrightarrow{-\alpha} X \xrightarrow{-\beta} Y \xrightarrow{-\beta} Z$$

R and Z are

(a) isotope (b) isobar
(c) isomer (d) isoneutronic

14. The dissociation of XY_2 is as

$$XY_2(g) \rightleftharpoons XY(g) + Y(g)$$

The initial pressure of XY_2 is 600 mm of Hg. On establishing the equilibrium the total pressure becomes 800 mm of Hg. What is the value of K for the reaction, when the volume of system remains unchanged?

(a) 50 (b) 100
(c) 166.6 (d) 150

15. The quantity of ionisation of decinormal solution of CH_3COOH is 1.3%. What is the pH value of this solution?
(log 1.3 = 0.11)

(a) 2.89 (b) 3.89
(c) 4.89 (d) 0.89

16. A buffer solution is obtained on adding 10 mL 1.0 M CH_3COOH and 20 mL 0.5 M CH_3COONa. It is diluted to 100 mL by distilled water. If $pK_a = 4.76$ for CH_3COOH, then the pH value of buffer solution

(a) 2.76 (b) 3.76
(c) 4.76 (d) 0.76

17. Hess's law is used in the determination of

(a) heat of reaction
(b) heat of formation
(c) heat of bond formation
(d) All of the above

18. 1.0 L of 1.0 M sodium hydroxide is neutralized by 1.0 L of 1.0 M methanoic acid. If the heat of formation of water is X then the heat of neutralization of this reaction is

(a) less than X (b) more than X
(c) equal to X (d) none of these

19. 1.0 L of 2.0 M acetic acid is added with 1.0 L of 3.0 M ethyl alcohol. The following reaction takes place during this process

$$CH_3COOH + C_2H_5OH \rightleftharpoons CH_3COOC_2H_5 + H_2O$$

If each solution is diluted by adding 1.0 L water, then initial rate of the reaction will reduce

(a) 0.5 times (b) 2.0 times
(c) 4.0 times (d) 0.25 times

20. For a reaction, the rate constant is 0.693×10^{-1} min^{-1} and initial concentration is 0.2 mol/L. Half-life period will be

(a) 400 s (b) 600 s
(c) 800 s (d) 100 s

21. For chemical reaction

$$N_2 + 3H_2 \longrightarrow 2NH_3$$

$$\frac{d[NH_3]}{dt} = 2 \times 10^{-4} \text{ mol } L^{-1} s^{-1}$$

The value of $-\frac{d[H_2]}{dt}$ will

(a) 1×10^{-4} mol L^{-1} s^{-1}
(b) 3×10^{-4} mol L^{-1} s^{-1}
(c) 4×10^{-4} mol L^{-1} s^{-1}
(d) 6×10^{-4} mol L^{-1} s^{-1}

22. Which of the following unit of energy show the maximum value of energy?

(a) Calorie (b) Joule
(c) Erg (d) Electron-volt

23. The value of standard reduction potentials of three metallic cations X, Y and Z are + 0.52, – 3.03 and – 1.18 volt respectively. The order of reducing power of these metal will

(a) $Y > Z > X$ (b) $X > Y > Z$
(c) $X > Z > Y$ (d) $Z > X > Y$

24. If $Fe^{2+} + 2e^{-1} \longrightarrow Fe$; $E^\circ = -0.44$ V
and $Zn^{2+} + 2e^{-1} \longrightarrow Zn$; $E^\circ = -0.76$ V
which of the following is the correct statement?

(a) Fe is more electropositive
(b) Zn is more electropositive
(c) Zn is more electronegative
(d) None of the above

25. On the electrolysis of aqueous $CuSO_4$ solution, by unreactive Pt electrodes, the reaction is occurred at anode

(a) $2SO_4^{2-} \longrightarrow S_2O_3^{2-} + 2\frac{1}{2}O_2 + 2e^-$

(b) $Cu^{2+} + 2e^- \longrightarrow Cu$

(c) $2H_2O \longrightarrow O_2 + 4H^+ + 4e^-$

(d) $2H^+ + 2e^- \longrightarrow H_2$

26. Which of the following chemical reaction represents homogeneous catalysis?

(a) $N_2(g) + 3H_2(g) \xrightarrow{Fe} 2NH_3(g)$

(b) $2SO_2(g) + O_2(g) \xrightarrow{NO} 2SO_3(g)$

(c) $CO(g) + 3H_2(g) \xrightarrow{Ni} CH_4(g) + H_2O(g)$

(d) $2SO_2(g) + O_2(g) \xrightarrow{V_2O_5} 2SO_3(g)$

27. Which of the following is correct for the reaction?

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

	Mn^{2+}	$C_2O_4^{2-}$	CO_2	H^+
(a)	5	2	4	10
(b)	2	5	10	16
(c)	6	8	16	18
(d)	10	12	24	12

28. The oxidation number of Cr is changed on reaction of acidic $K_2Cr_2O_7$ with H_2S

(a) + 3 to + 6 (b) + 6 to + 3
(c) + 6 to + 2 (d) remains unchanged

29. The oxidation number of oxygen is + 2 in, which of the following compound?

(a) H_2O_2 (b) CO_2
(c) H_2O (d) OF_2

30. Which of the following is the most electronegative?

(a) Lead (b) Silicon
(c) Carbon (d) Tin

31. Which of the following is the *s*-block element?

(a) Aluminium (b) Chromium
(c) Carbon (d) Potassium

32. Which of the following is the correct order of decreasing ionic radii of ions?

(a) $N^{3-} > O^{2-} > F^- > Na^+$

(b) $N^{3-} > Na^+ > O^{2-} > F^-$

(c) $Na^+ > O^{2-} > N^{3-} > F^-$

(d) $Na^+ > F^- > O^{2-} > N^{3-}$

33. The electronic configuration of a element is as $1s^2, 2s^2\ 2p^6, 3s^2, 3p^6, 3d^{10}, 4s^2, 4p^3$

The property of this element is similar to

(a) boron (b) oxygen
(c) nitrogen (d) chlorine

34. Malachite is the ore of

(a) Fe (b) Cu
(c) Zn (d) Hg

35. For the purification of blister copper, the copper is melted in the furnance and stirring with green logs of woot. The purpose of this

(a) to remove dissolved gases in blister copper
(b) by taking the impurities on the surface to oxidise them
(c) to increase the quantity of carbon in copper
(d) the impurities of metal oxide are reduced by hydrocarbon gases evolved from wood

36. In the smelting of a metal ore, a substance is added, which forms a fusible product on mixing with impurities. The name of this substance is

(a) slag (b) mud
(c) gangue (d) flux

37. Which of the following pair cannot remain together?

(a) $NaHCO_3$ and NaCl
(b) $NaHCO_3$ and NaOH
(c) $NaHCO_3$ and Na_2CO_3
(d) Na_2CO_3 and NaOH

38. Which of the following has the highest melting point?

(a) Barium (b) Strontium
(c) Calcium (d) Radium

39. The transition elements are generally

(a) diamagnetic
(b) paramagnetic
(c) neither diamagnetic nor paramagnetic
(d) both diamagnetic and paramagnetic

40. The oxidation number of metal is zero in, which of the following co-ordination compound?

(a) $[Pt(NH_3)_2Cl_2]$ (b) $[Cr(CO)_6]$
(c) $[Cr(NH_3)_3Cl_3]$ (d) $[Cr(en)_2Cl_2]$

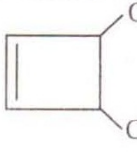
41. $[(C_6H_5)_2Pd(NCS)_2]$ and $[(C_6H_5)_2Pd(SCN)_2]$ are

(a) linkage isomers
(b) coordination isomers
(c) ionisation isomers
(d) geometrical isomers

42. The product forms mainly on the fusion of Na with aniline
(a) NaCN (b) NaN_3
(c) NaSCN (d) $NaNO_2$

43. The combustion of liquid benzene in oxygen is as
$2C_6H_6 + 15O_2 \longrightarrow 12CO_2 + 6H_2O$
How many litre of oxygen will require on complete combustion of 3.9 g liquid benzene at STP
(a) 11.2 L (b) 22.4 L
(c) 8.4 L (d) 7.4 L

44. The IUPAC name of the following compounds



is
(a) 3-methyl cyclo-1-butene-2-ol
(b) 4-methyl cyclo-but-2-ene-1-ol
(c) 4-methyl cyclo-but-1-ene-3-ol
(d) 2-methyl cyclo-3-butene-1-ol

45. Which of the following compound does not show optical isomerism?
(a) $CH_3CH(OH)Br$
(b) $CH_3CH(OH)CH_3$
(c) $CH_3CH_2CHBrCH(CH_3)_2$
(d) $CH_3—CHOH—CHBr—CH_2OH$

46. In the following dehydration reaction the hybridised state of carbon changes
$CH_3CONH_2 \xrightarrow{P_2O_5} CH_3CN + H_2O$
(a) sp^3 to sp^2 (b) sp to sp^2
(c) sp^2 to sp (d) sp to sp^3

47. Acetylene reacts with HCN in the presence of $Ba(CN)_2$ to give
(a) vinyl cyanide
(b) 1,1-dicyano ethane
(c) 1,2-dicyano ethane
(d) None of the above

48. The substitution of chlorine becomes the most easiest in which of the following compound?
(a) Chloro benzene (b) Vinyl chloride
(c) Allyl chloride (d) *p*-chloro toluene

49. Commercially, methanol is manufactured by which of the following method?
(a) Catalytic reduction of CO in the presence of ZnO, Cr_2O_3
(b) The reaction of CH_4 with water vapour in the presence of Ni catalyst at 900°C
(c) By the reaction of formaldehyde with $LiAlH_4$
(d) By the reaction of HCHO with aqueous KOH

50. The order of acidic strength of phenol, *p*-cresol, *m*-nitrophenol and *p*-nitrophenol is
(a) phenol, *p*-cresol, *p*-nitrophenol, *m*-nitrophenol
(b) *p*-cresol, phenol, *m*-nitrophenol, *p*-nitrophenol
(c) *p*-cresol, *m*-nitrophenol, phenol, *p*-nitrophenol
(d) *m*-nitrophenol, phenol, *p*-cresol, *p*-nitrophenol

Answer – Key

1. d	**2.** d	**3.** d	**4.** c	**5.** d	**6.** a	**7.** c	**8.** a	**9.** b	**10.** c
11. c	**12.** b	**13.** a	**14.** b	**15.** a	**16.** c	**17.** d	**18.** a	**19.** d	**20.** b
21. b	**22.** a	**23.** a	**24.** a	**25.** c	**26.** b	**27.** b	**28.** b	**29.** d	**30.** c
31. d	**32.** a	**33.** c	**34.** b	**35.** d	**36.** d	**37.** b	**38.** c	**39.** b	**40.** b
41. a	**42.** a	**43.** c	**44.** b	**45.** b	**46.** c	**47.** a	**48.** c	**49.** a	**50.** b