

Chemistry

PR – XI (A-I-A2) (25)

۱۔ ہر سوال کے سامنے چار دائرے دیئے گئے ہیں۔ صرف صحیح جواب والا دائرہ بھر دیں۔

۲۔ دائروں کو شیڈ (بھرنے) کے لیے نیلے یا کالے رنگ کا پن استعمال کریں۔

۳۔ جواب میں ایک سے زائد دائرے بھرنے سے جواب غلط تصور ہوگا۔

Time: 20 Min

SECTION-A

Marks: 18

- 1) What mass of CO_2 is formed by taking 0.5mol of CaCO_3 ?
 $\text{CaCO}_3 \longrightarrow \text{CaO} + \text{CO}_2$
☐ 355 g ☐ 56 g ☐ 44 g ☒ 22 g
- 2) The transition from $n = 5$ to $n = 2$ in hydrogen corresponds to which line in the spectrum?
☐ First line of Balmer Series
☐ Second line of Balmer Series
☒ Third line of Balmer Series
☐ Fourth line of Balmer Series
- 3) Ratio of sigma and pi bond in Nitrogen gas is:
☐ 1:3 ☐ 3:1 ☐ 2:1 ☒ 1:2
- 4) Which of the given molecule has least bond angle?
☐ CH_4 ☐ H_2O ☐ BF_3 ☒ SnCl_2
- 5) Which method is commonly used for liquefaction of gases?
☒ Compression & expansion ☐ Evaporation
☐ Diffusion ☐ Heating and cooling
- 6) Iodine exists in solid state due to the presence of:
☐ Hydrogen bonding ☒ London dispersion forces
☐ Dipole dipole forces ☐ Covalent bonding
- 7) What happens to intermolecular space when an intermolecular force between them increase?
☒ Decrease ☐ Increase
☐ Remains constant ☐ Become zero
- 8) Which crystalline form is exhibited by the KNO_3 ?
☒ Trigonal and orthorhombic

- ☐ Rhombohedral and orthorhombic
☐ Cubic and orthorhombic
☐ Rhombic and monoclinic
- 9) Around a given cations only a certain number of anions can be accommodated, this number is called:
- ☐ Atomic number ☐ Avogadro's number
☒ Co-ordination number ☐ Group number
- 10) What is the main reason for the low density of ice?
- ☐ Ionic bonding ☒ Hydrogen bonding
☐ High pressure ☐ Metallic bonding
- 11) For a reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$ value of K_p is:
- ☒ Less than K_c ☐ More than K_c
☐ Equal to K_c ☐ May be less or more
- 12) Consider following reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$
Reaction will move in reverse direction if:
- ☒ Conc. of NH_3 increase ☐ Conc. of H_2 increases
☐ Conc. of NH_3 decreases ☐ Conc. of N_2 increases
- 13) What is the pH of 0.0001M H_2SO_4 ?
- ☐ 4 ☐ 3 ☐ 2.69 ☒ 3.69
- 14) Which salt solution has pH value less than 7?
- ☐ NaCl ☒ NH_4Cl ☐ CH_3COONa ☐ CH_3COONH_4
- 15) Unit of Rate constant (k) for the second order reaction is:
- ☒ $mol\ dm^{-3}s^{-1}$ ☐ s^{-1}
☐ $mol\ dm^{-3}$ ☐ $mol^2dm^{-6}s^{-1}$
- 16) What is molarity of solution if 20g NaOH present in 500 cm^3 of solution?
- ☒ 1 ☐ 2 ☐ 0.5 ☐ 0.1
- 17) Which one of the given is path function?
- ☐ Internal energy ☒ Enthalpy
☐ Pressure ☐ Heat
- 18) Oxidation number of carbon in $NaHCO_3$ is:
- ☒ +4 ☐ -4 ☐ +2 ☐ -2

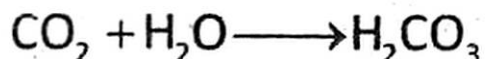
Chemistry

Note: Time allowed for Section-B and Section-C is 2 Hours and 40 minutes.

SECTION-B

Attempt any TEN parts. Each part carries FOUR marks.

Q1: If 44g of Carbon dioxide react with 2 mol of water to form carbonic acid which one is limiting reagent.



Q2: What is the number of moles in 2.5 kg of sodium hydroxide?

Q3: What is energy difference when an electron jumps from 5th shell to 1st shell for hydrogen atom.

Q4: Draw MOT diagram for H₂ also tells about bond order and magnetic behavior.

Q5: What do you know about compressibility factor? How it can be expressed mathematically?

Q6: Determine the relative rates of diffusion for equal volume of N₂ and N₂O under same temperature and pressure?

Q7: What is vapour pressure, why water has lower vapour pressure than ether at room temperature and pressure?

Q8: What is heat of vaporization? Why water has low vapour pressure?

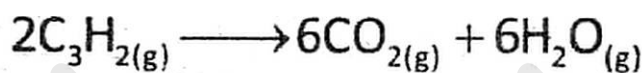
Q9: What is buffer action? What happens when small amount of HCl and NaOH is added respectively to the following buffer?



Q10: How catalyst effect the rate of reaction, justify with the help of an example.

Q11: Write down four characteristics of colloids. Give one example.

Q12: Heat of formation of C₃H_{6(g)}, CO_{2(g)} and H₂O_(g) in kJ/mol are +19.7, -393 and -285.81 respectively. Calculate heat of combustion.



Q13: Balance redox equation by ion electron method (neutral medium). $\text{X}^{2+} + \text{Y}^{3+} \longrightarrow \text{X}^{4+} + \text{Y}^{2+}$

SECTION-C

Note: Attempt any THREE questions. All questions carry equal marks.

Q14 (a) Drive the equation for the radius of nth orbit of Helium atom using Bohr's model.

(b) Explain Hybridization in Ethyne with structure.

Q15 (a) Calculate density of ethane (C_2H_6) at STP.

(b) Explain structure of NaCl crystal with diagram.

Q16 (a) Calculate the concentration of Ag^+ ions when solid silver acetate (CH_3COOAg) is added to water. The solubility product of CH_3COOAg is 2.9×10^{-4} .

(b) Explain Raoult's law, when non volatile solute is added to volatile liquid.

Q17 (a) Calculate lattice energy of NaCl.

(i) Heat of formation of NaCl is -411 kJ/mol

(ii) Heat of sublimation of Na is 109 kJ/mol

(iii) Ionization energy of Na is 496 kJ/mol

(iv) Heat of dissociation of Cl_2 is 242 kJ/mol

(v) Electron affinity of Cl is -348 kJ/mol

(b) Balance the given equation by oxidation number method.

