JAIN COLLEGE

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SUBJECT: CHEMISTRY

I PUC
MOCK- I

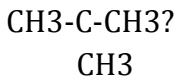
Timings Allowed: 3 Hrs 15 Minutes ***Total Marks: 70***

Instructions: i) The question paper has four Parts.
ii) Parts A, B, C and D are common to all candidates.
iii) Part A carries 10 marks. Each question carries one mark. Part B carries 20 marks. Each question carries two marks. Part C carries 40 marks. Each question carries five marks. In Part D-D_1 carries 10 marks and D_2 carries five marks.
iv) Write balanced chemical equations and draw diagrams wherever necessary.

PART-A

I. Answer all questions. Answer each question in one word or in one sentence. 10x1=10

1) Define molarity.
2) Give the electronic configuration of element with atomic number 29.
3) How is sigma bond formed?
4) What type of hybridization found in ethyne w.r.t carbon?
5) Write the thermochemical equation for combustion of methane.
6) State modern periodic law.
7) What is the chemical composition of dry ice?
8) What is lindlar's catalyst?
9) What is the IUPAC name of



10) What is the oxidation number of oxygen in peroxides?

PART-B

II.Answer any FIVE questions. Each question carries two marks. 5x2=10

11) How are alkenes prepared from alkyl halides? Give reaction.
12) The enthalpy of formation of HgO is -90 k J mol^{-1}. How much heat is needed to decompose 5.32 g of HgO?
13) Mention the series of lines obtained in hydrogen spectrum.
14) How is baking soda manufactured by Solvay's process?
15) Explain the industrial production of diborane.
16) Explain cyclic polymerization of ethyne with reaction.
17) What are the harmful effects of global warming?
18) Explain ozonolysis with an example.

PART-C

III.Answer any FIVE questions. Each question carries THREE marks. 5x3=15

19)a) What are isoelectronic species? (1)
b) Radius of cation is smaller and the radius of anion is bigger than the respective atoms. Justify.(2)
20)a) Define lattice enthalpy. (1)
b) Mention any two conditions for the combination of atomic orbitals. (2)

21)a) Helium molecule do not exist . Why? (2)

b) Define hydrogen bond. (1)

22) Write the postulates of VSEPR theory. (3)

23Balance the following reaction by oxidation method.

$Cr_2O_{7\,(aq)} + SO_3^{2-}{}_{(aq)} \longrightarrow Cr3^{+}{}_{(aq)} + SO_4^{2-}{}_{(aq)}$ (acidic medium) (3)

24)a)What is the composition of water gas? (1)

b) Give any four uses of H_2O_2. (2)

(2)

25) How is caustic soda commercially prepared? (3)

26) What are the two major allotropes of carbon? List out the characteristic differences between them. (3)

PART-D(IV and V)

IV. Answer any FIVE questions. Each question carries FIVE marks. 5x5=25

27)a) State law of definite proportions. (1)

b) Find the empirical formula for the compound which contains 51.28 % , 9.40% , 27.35 % and 11.97% of carbon,hydrogen,oxygen and nitrogen respectively. Molar mass of the compound is 234 g mol^{-1}. (4)

28)a) Write the significance of four quantum numbers. (4)

b) What is the subshell notation if n=2 and l= 1? (1)

29)a) Write any three limitations of Bohr's theory (3)

b) Calculate the wave number of the emitted radiation when an electron in an excited hydrogen atom undergoes transition from n=2 to n=1.[R=1.09677x10^{-7} m^{-1}] (2)

30)a) What are the causes for deviation of real gases from ideal behavior? (2)

b) Write the postulates of kinetic theory of gases. (3)

31)a) Describe Born-Haber cycle for the formation of NaCl. (3)

b) State Levoisier- Laplace law. (2)

32) a) What are the factors affecting the heat of a reaction? (2)

b) Calculate the heat of combustion of CH_4, given

$C_{(s)} + O_{2\,(g)} \longrightarrow CO_{2\,(g)}$ ΔH=-393.5 k J

$H_{2\,(g)} + 1\backslash 2\ O_{2\,(g)} \longrightarrow H2O\ (_l)$ ΔH=-286 k J

$C_{(s)} + 2H_{2\,(g)} \longrightarrow CH_4\ (_g)$ ΔH=-74.8 k J

33)a) When is K_P=K_C? Give an example for the same. (2)

b) What are the conditions for a reaction to be a reversible reaction? (2)

c) What is the effect of catalyst on chemical equilibrium? (1)

34)a) Derive pH +pOH=pK_W (2)

b) Briefly explain the concept of lewis acids and bases. (2)

c) Define common ion effect. (1)

V.Answer any TWO questions. Each question carries five marks. 2x5=10

35)a) Explain the mechanism of nitration of benzene. (3)

b) How are alkenes prepared from alkyl halides? (2)

36) a) How do you detect halogens present in sodium fusion extract? (3)

b) What are free radicals? How are they formed? (2)

37)a) Write a note on differential extraction of compounds. (3)

b) Define i) functional group (1)

ii) resonance energy (1)

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