![Teko Classes logo] **ENJOY MATHEMATICS WITH SUHAAG SIR**

R-1, OPPOSITE RAILWAY TRACK, NEW GLASS CORNER BUILDING, ZONE-2 , M. P. NAGAR, BHOPAL ☎:(0755) 32 00 000, 98930 5 888 1

IIT-JEE, AIEEE (WITH 12TH, 11TH10TH, 9TH & DROPPERS) www.tekoclasses.com **Page:** 1

SOLUTION OF IITJEE 2012; PAPER 1 ; BHARAT MAIN SABSE PAHLE, WEBSITE PAR BHI....

PAPER 1
CHEMISTRY

21. As per IUPAC nomenclature, the name of the complex $\left[Co(H_2O)_4(NH_3)_2 \right]Cl_3$ is

(a) Tetraaquadiaminecobalt (III) chloride

(b) Te traaquadiamminecobalt (III) chloride

(c) Diaminetetraaquacobalt (III) chloride

(d*) Diamminetetraaquacobalt (III) chloride

**22.** In allene (C_3H_4), the type(s) of hybridisation of the carbon atoms is (are)

(a) sp and sp^3 (b*) sp and sp^2

(c) only sp^2 (d) sp^2 and sp^3

23. For one mole of a van der Waals gas when b = 0 and T = 300K, the PV vs. 1/V plot is shown below. The value of the van der Waals constant a (atm. $liter^2\ mol^{-2}$) is

[Graph not to scale]
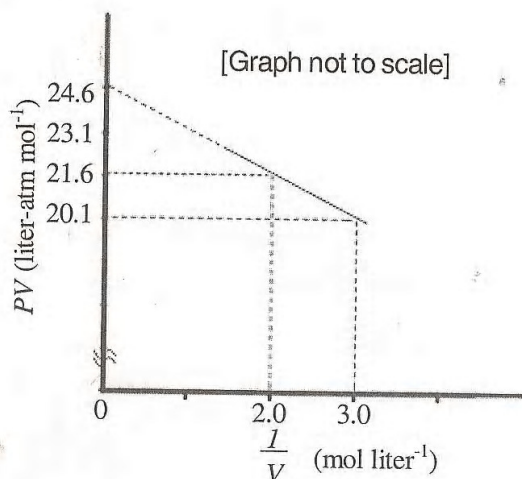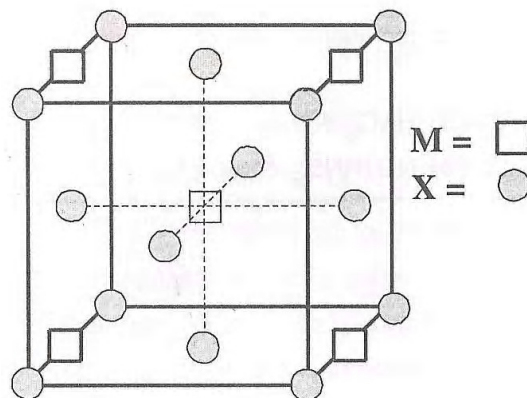
(a) 1.0   (b) 4.5

(c*) 1.5   (d) 3.0

24. The number of optically active products obtained form the complete ozonolysis of the given compound is
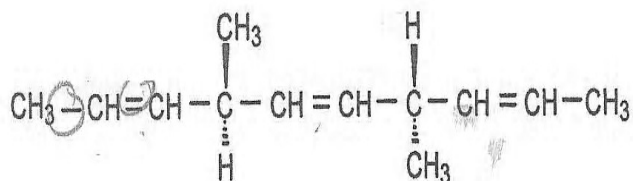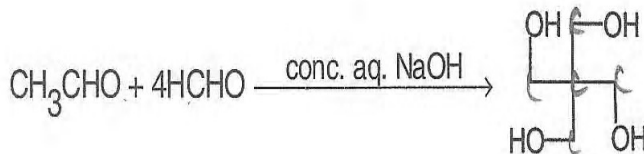

(a*) 0   (b) 1

(c) 2   (d) 4

25. A compound M_pX_q has cubiuc close packing (ccp) arrangement of X. Its unit cell structure is shown below. The expirical formula of the compound is

(a) MX   (b) MX_2

(c) M_2X (d) M_5X_{14}

26. The number of aldol reaction(s) that occurs in the given transformation is

(a) 1   (b) 2

(c*) 3   (d) 4

27. The colour of light absorbed by an aqueous solution of $CuSO_4$ is

(a*) orange-red   (b) blue-green

(c) yellow   (d) violet

28. The carboxyl functional group (–COOH) is present in

(a) picric acid   (b) barbituric acid

(c) ascorbic   (d*) aspirin

29. The kinetic energy of an electron in the second Bohr orbit of a hydrogen atom [a_0 is Bohr radius]

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(a) $\dfrac{h^2}{4\pi^2 ma_0^2}$

(b) $\dfrac{h^2}{16\pi^2 ma_0^2}$

(c*) $\dfrac{h^2}{32\pi^2 ma_0^2}$

(d) $\dfrac{h^2}{64\pi^2 ma_0^2}$

30. Which ordering of compunds is according t oteh decreasing order of the oxidation stat of nitrogen ?

(a) HNO_3, NO, NH_4Cl, N_2

(b*) HNO_3, NO, N_2, NH_4Cl

(c) HNO_3, NH_4Cl, NO, N_2

(d) NO, HNO_3, NH_4Cl, N_2

MORE THAN ONE MAY CORRECT TYPE

31. Indentify the binary mixutre(s) that can be separated into individual compounds, by differential extraction, as shown in the given scheme.


(a) C_6H_5OH and C_6H_5COOH

(b*) C_6H_5COOH and $C_6H_5CH_2OH$

(c) $C_6H_5CH_2OH$ and C_6H_5OH

(d*) $C_6H_5CH_2OH$ and C_6H_5COOH

32. Choose the correct reason(s) for the stability of the lyophobic colloidal particles.

(a*) Preferential adsorption of ions on their surface from the solution

(b) Preferential adsorption of solvent on their surface form the solution

(c) Attraction between different particles having opposite charges on their surface

(d*) Potential difference between the fixed layer and the diffused layer of opposite charges around the colloidal particles

33. Which of the following molecules, in pure form, is (are) unstable at room temperature ?

(A)

(B)

(C)

(D)
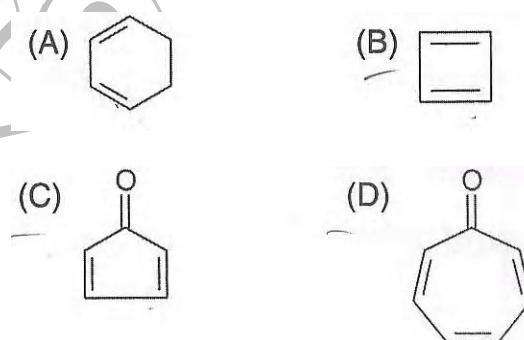
ANS. B

34. Which of the following hydrogen halides react(s) with $AgNO_3$ (aq) to give a precipitate the dissolves in $Na_2S_2O_3(aq)$?

(a*) HCl

(b) HF

(c*) HBr

(d*) HI

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35. For an ideal gas, consider only P-V work in going form an initial state X to teh final state Z. Teh final state Z can be reached by either of the two paths shown in the figure. Which of the following choice(s) is (are) correct ? [take ΔS change in entropy and w as work done]
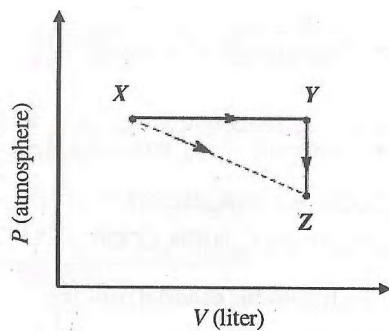
(a*) $\Delta S_{x \to z} = \Delta S_{x \to y} + \Delta S_{y \to z}$

(b) $w_{x \to z} = w_{x \to y} + w_{y \to z}$

(c*) $w_{x \to y \to z} = w_{x \to y}$

(d) $\Delta S_{x \to y \to z} = \Delta S_{x \to y}$

INTEGER ANSWER TYPE

36. The subsrtituents R_1 and R_2 for nine peptides are listed in the table given below. How many of these peptides are positively charged at pH = 7.0 ? ANS. 4
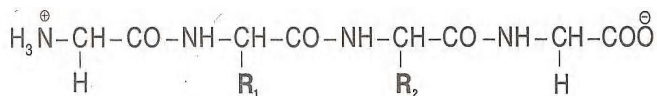

Peptide	R_1	R_2
I	H	H
II	H	CH_3
III	CH_2COOH	H
IV	CH_2CONH_2	$(CH_2)_4NH_2$
V	CH_2CONH_2	CH_2CONH_2
VI	$(CH_2)_4NH_2$	$(CH_2)_4NH_2$
VII	CH_2COOH	CH_2CONH_2
VIII	CH_2OH	$(CH_2)_4NH_2$
IX	$(CH_2)_4NH_2$	CH_3

37. The periodic table consists of 18 groups. An isotope of copper, on bombardment with protons, undergoes a nuclear reaction yielding element X as shown below. To which group, element X belongs in the periodic

$$^{63}_{29}Cu + ^1_1 H \to 6^1_0 n + \alpha + 2^1_1 H + X \text{ d}$$
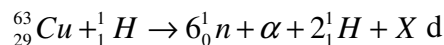
ANS. 8

38. When the following aldohexose exists in its D-condiguration, the total number of stereoisomers in its pyranose form is
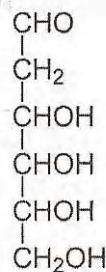
ANS 8

39. 2.9.2% (w/w) HCl stock soluition has a density of $1.25 \ g \ mL^{-1}$. The molecular weight of HCl is $36.5 g \ mol^{-1}$. The volume (mL) of stock solution required to prepare a 200 mL solution of 0.4 M HCl is

ANS 8

40. An organic compound undergoes first-order decomposition. The time taken for its decomposition to 1/8 and 1/10 of its initial concentration are $t_{1/8}$ and $t_{1/10}$ respectively.

What is the value of $\dfrac{[t_{1/8}]}{[t_{t/10}]} \times 10$? (take $\log_{10} 2 = 0.3$)

ANS. 9