

(ENGLISH VERSION)

1. Answer the following questions (Alternatives are to be noted) : $2 \times 5 = 10$

- (a) KBr undergoes 80% dissociation in its 0.5 (M) aqueous solution. Calculate osmotic pressure of the solution at 27°C temperature. 2

OR

What is azeotropic mixture ? Can it be considered as ideal solution ?

(1 + 1) = 2

- (b) Write two differences between physisorption and chemisorption. 2

OR

What is peptisation ? Give one example.

(1 + 1) = 2

- (c) Mention two differences between bleaching action of SO_2 and Cl_2 . 2

OR

Which of the halogen hydracids forms bi-salt ? Write reasons.

(1 + 1) = 2

- (d) Which type of isomerism is shown by the two complexes : $[\text{Co}(\text{NH}_3)_5\text{SO}_4]\text{Br}$ and $[\text{Co}(\text{NH}_3)_5\text{Br}]\text{SO}_4$? How would you distinguish between two complexes ?

(1 + 1) = 2

- (e) Write the name of monomer units of Dacron and mention one use of it.

(1 + 1) = 2

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2. Answer the following questions (Alternatives are to be noted) : $3 \times 9 = 27$

- (a) (i) Which type of stoichiometric defects is shown by AgBr crystal ?
- (ii) Chromium (atomic mass = 52) metal has body-centred cubic structure. The radius of chromium atom is 124.3 pm. Calculate the density of chromium metal. $(1 + 2) = 3$

OR

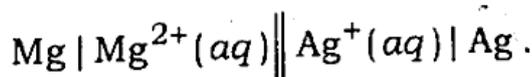
- (i) What do you mean by packing fraction of cubic unit cell ?
- (ii) Calculate packing fraction of a face-centred cubic unit cell.

$(1 + 2) = 3$

(b) (i) What is the vapour pressure of pure water at 100°C temperature ? <https://www.westbengalboard.com>

- (ii) 12 gm of a solid solute is dissolved in 90 gm pure water. Vapour pressure of the resulting solution is 750 mm Hg at 100°C temperature. Calculate molecular mass of the solute. [Solute does not undergo any dissociation or association in its aqueous solution.] $(1 + 2) = 3$

(c) Write cell reaction and calculate electrical work obtained from the following galvanic cell at standard condition :



[Given : $E^{\circ}_{\text{Mg}^{2+}/\text{Mg}} = -2.36$ volt & $E^{\circ}_{\text{Ag}^{+}/\text{Ag}} = 0.80$ volt.]

$(1 + 2) = 3$

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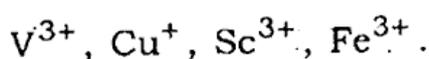
- (d) (i) Write composition of copper matte.
(ii) Write balanced equations for the reactions involved in the extraction of copper from copper matte. (1 + 2) = 3

OR

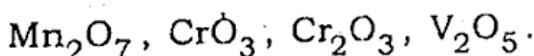
- (i) Which type of ores is concentrated by froth floatation process ?
(ii) What is thermit mixture ? Mention one use of it.

1 + (1 + 1) = 3.

- (e) (i) Which of the following are coloured in aqueous solution ? Give reasons :



- (ii) Which of the following oxides are amphoteric ?



(1 + 1) + 1 = 3

OR

- (i) Explain why most of the Cu(I) compounds are unstable in aqueous solution.

- (ii) What happens when MnO_4^{2-} ion is kept in acid medium ?

Write balanced equation.

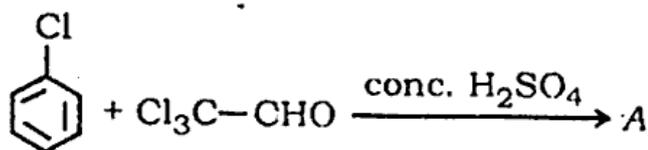
(2 + 1) = 3

- (f) (i) Write R/S configurations of $H \begin{array}{c} \text{OH} \\ | \\ \text{---} \\ | \\ \text{COOH} \end{array} CH_3$ and $H_3C \begin{array}{c} \text{D} \\ | \\ \cdots \\ | \\ \text{NH}_2 \\ \uparrow \\ \text{H}^1 \end{array}$

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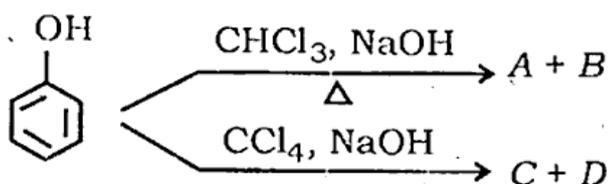
- (ii) Write structural formula of 'A' for the following reaction :



1

- (iii) Distinguish between propanone and pentan-3-one by a suitable chemical test. 1

- (g) (i) Write the structural formulae of A, B, C, D in the following reactions :



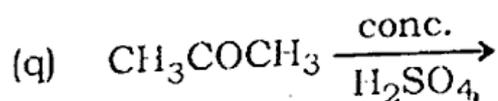
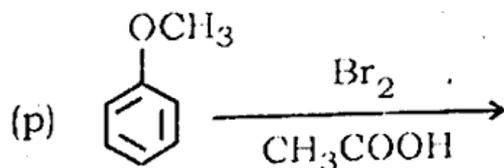
- (ii) Write equation of the following conversion :

Salicylic acid to aspirin.

(1 + 1) + 1 = 3

OR

- (i) Write structural formulae of products obtained in the following reactions :



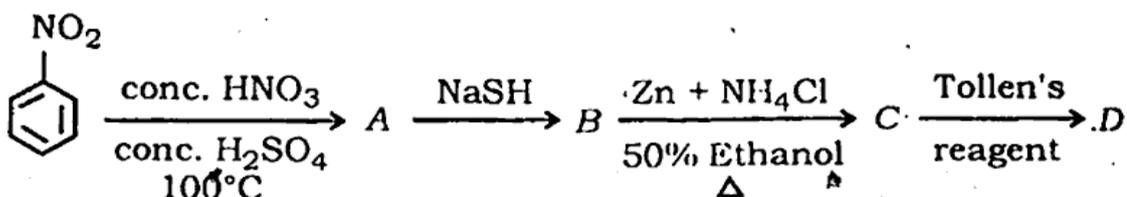
- (ii) Mention one use of Lucas' reagent.

(1 + 1) + 1 = 3

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- (h) (i) Convert aniline to fluorobenzene.
(ii) Write structural formula of the compounds A to D :

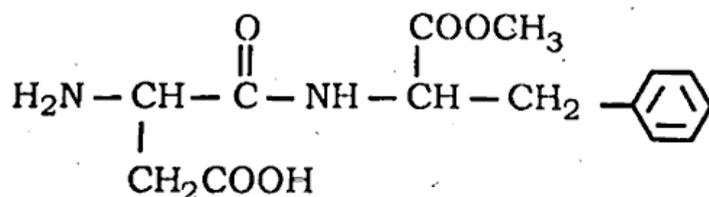


(1 + 2) = 3

OR

An organic compound A (C₃H₈O) on treatment with Cu dust at 573 K gives B. B does not reduce Fehling's solution but gives a yellow precipitate of compound C with I₂/NaOH. Deduce the structures of A, B and C and their IUPAC names. 3

- (i) (i) The following compound is an example of peptide :



- (r) Write Zwitterion structure of the compound.
(s) How many amino acids will be obtained on hydrolysis of the compound ?
(ii) Write equation for the reaction of glucose with periodic acid.

(1 + 1) + 1 = 3

3. Answer the following questions (Alternatives are to be noted) : $5 \times 3 = 15$

(a) (i) Draw the graph of half-life period ($t_{\frac{1}{2}}$) versus initial concentration of reactant ($[A]_0$) for a zero order reaction.

Give reasons in favour of your answer.

(ii) The rate of a reaction at 400 K is 10 times than the rate of the reaction at 200 K. Calculate activation energy of the reaction.

(2 + 3) = 5

OR

(i) The unit of rate constant of a chemical reaction is $L^2 \text{mol}^{-2} \text{s}^{-1}$. Calculate order of the reaction.

(ii) The rates of a first order reaction after 10 mins and 20 mins from the commencement of the reaction are $0.04 \text{ mol L}^{-1} \text{s}^{-1}$ and $0.03 \text{ mol L}^{-1} \text{s}^{-1}$ respectively. Calculate half-life period of the reaction.

(2 + 3) = 5

(b) (i) What is the shape of XeF_4 molecule ? Write the chemical equation of the reaction of XeF_4 and KI ?

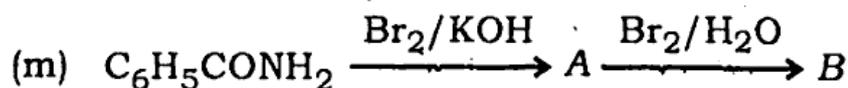
NH_3

(ii) What is Nessler's reagent ? Where is it used ?

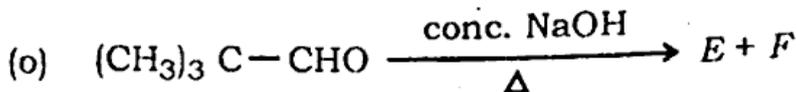
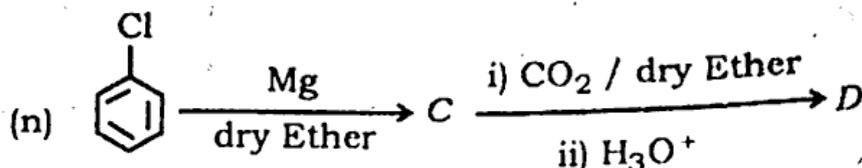
(iii) IF_7 can be prepared but BrF_7 cannot be prepared. Why ?

(2 + 2 + 1) = 5

(c) (i) Write structural formula of the compounds A to F.



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(ii) Convert the following :

(p) Benzaldehyde to Cinnamic acid.

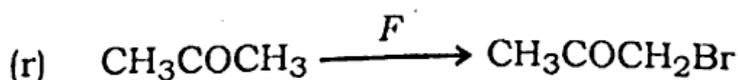
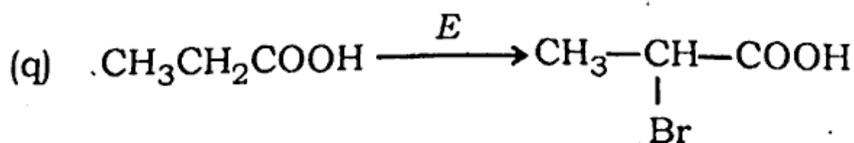
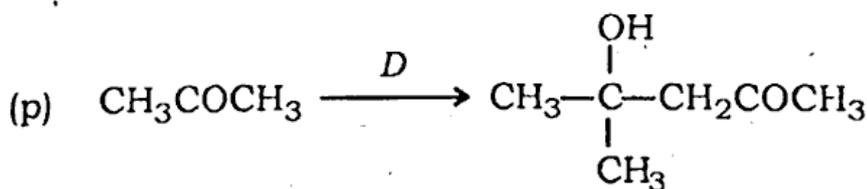
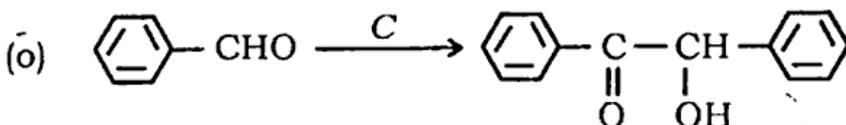
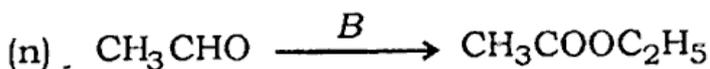
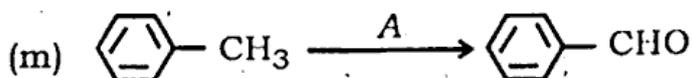
(q) Acetic acid to acetaldehyde.

(3 + 2) = 5

OR

(i) What is the reason for the reducing property of formic acid ?
Give example of its reducing property.

(ii) Mention the reagents used for the following conversions :



(1 + 1) + 3 = 5

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(HINDI VERSION)

1. निम्नलिखित प्रश्नों के उत्तर दीजिए (वैकल्पिक प्रश्नों पर ध्यान दें) : 2 × 5 = 10
- (a) 0.5 (M) जलीय विलयन में KBr 80% वियोजित हो जाता है। 27°C तापमान पर उस विलयन का परासरण दाब की गणना कीजिए। 2

अथवा

एजीओट्रोपिक मिश्रण क्या है ? क्या इसे आदर्श विलयन के रूप में माना जा सकता है ? (1 + 1) = 2

- (b) भौतिक शोषण तथा रासायनिक शोषण के बीच दो अंतर लिखिए। 2

अथवा

पेप्टाइजेशन क्या है ? एक उदाहरण दीजिए। (1 + 1) = 2

- (c) SO₂ तथा Cl₂ के विरंजक क्रिया के बीच दो अंतरों का उल्लेख कीजिए। 2

अथवा

कौन-सा हैलोजेन हाइड्रासिड बाइ-लवण निर्मित करता है ? कारणों को लिखिए।

(1 + 1) = 2

- (d) [Co(NH₃)₅SO₄]Br तथा [Co(NH₃)₅Br]SO₄ संकर (complex) दो यौगिक किस तरह की समावयवता प्रदर्शित करते हैं ? इन दो संकर यौगिकों के बीच आप कैसे अंतर स्पष्ट करेंगे ? (1 + 1) = 2

- (e) डेक्रॉन के एकलक इकाइयों के नाम लिखिए तथा उसके एक प्रयोग का उल्लेख कीजिए। (1 + 1) = 2

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