

JEE Main 2023 April 10 Shift 1 Chemistry Question Paper with Solutions

Time Allowed :3 Hours

Maximum Marks :300

Total Questions :90

General Instructions

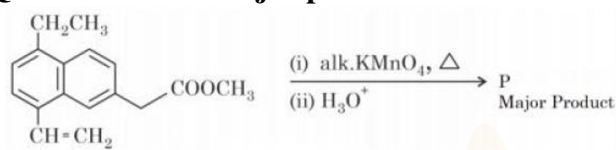
Read the following instructions very carefully and strictly follow them:

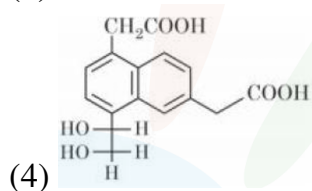
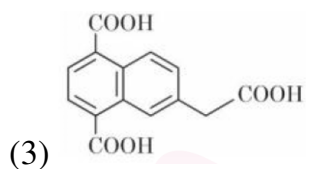
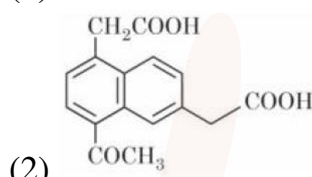
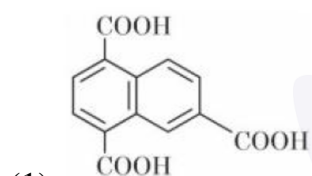
1. The test is of 3 hours duration.
2. The question paper consists of 90 questions, out of which 75 are to attempted.
The maximum marks are 300.
3. There are three parts in the question paper consisting of Physics, Chemistry and Mathematics having 30 questions in each part of equal weightage.
4. Each part (subject) has two sections.
(i) Section-A: This section contains 20 multiple choice questions which have only one correct answer. Each question carries 4 marks for correct answer and –1 mark for wrong answer.
(ii) Section-B: This section contains 10 questions. In Section-B, attempt any five questions out of 10. The answer to each of the questions is a numerical value. Each question carries 4 marks for correct answer and –1 mark for wrong answer. For Section-B, the answer should be rounded off to the nearest integer

Chemistry

Section-A

Question 1: The major product 'P' formed in the given reaction is

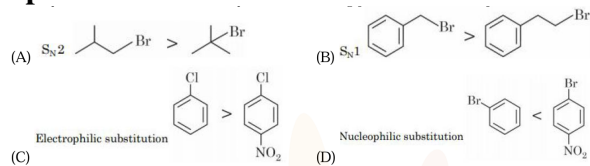




Question 2: Prolonged heating is avoided during the preparation of ferrous ammonium sulphate to

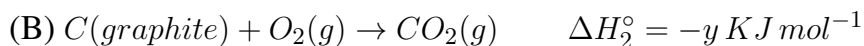
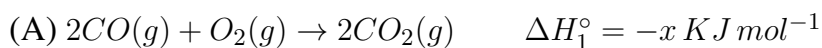
- (1) prevent hydrolysis
- (2) prevent reduction
- (3) prevent breaking
- (4) prevent oxidation

Question 3: Identify the correct order of reactivity for the following pairs towards the respective mechanism

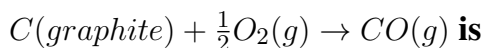


- (1) (A), (C) and (D) only
- (2) (A), (B) and (D) only
- (3) (B), (C) and (D) only
- (4) (A), (B), (C) and (D)

Question 4: Given



The ΔH° for the reaction



(1) $\frac{x-2y}{2}$

(2) $\frac{x+2y}{2}$

(3) $\frac{2x-y}{2}$

(4) $2y - x$

Question 5: Using column chromatography mixture of two compounds 'A' and 'B' was separated. 'A' eluted first, this indicates 'B' has

- (1) high R_f , weaker adsorption
- (2) high R_f , stronger adsorption
- (3) low R_f , stronger adsorption
- (4) low R_f , weaker adsorption

Question 6: Lime reacts exothermally with water to give 'A' which has low solubility in water. Aqueous solution of 'A' is often used for the test of CO_2 . a test in which insoluble B is formed. If B is further reacted with CO_2 then soluble compound is formed. 'A' is

- (1) Quick lime
- (2) Slaked lime
- (3) White lime
- (4) Lime water

Question 7: Match List I with list II

List I: Industry	List II: Waste Generated
(A) Steel plants	(I) Gypsum
(B) Thermal power plants	(II) Fly ash
(C) Fertilizer industries	(III) Slag
(D) Paper mills	(IV) Bio-degradable wastes

Choose the correct answer from the options given below.

- (1) (A)-(III), (B)-(II), (C)-(I), (D)-(IV)
 - (2) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)
 - (3) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
 - (4) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
-

Question 8: Suitable reaction condition for preparation of Methyl phenyl ether is

- (1) Benzene, MeBr
 - (2) $\text{PhO}^{\ominus}\text{Na}^{\oplus}$, MeOH
 - (3) Ph-Br, $\text{MeO}^{\ominus}\text{Na}^{\oplus}$
 - (4) $\text{PhO}^{\ominus}\text{Na}^{\oplus}$, MeBr
-

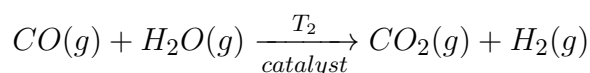
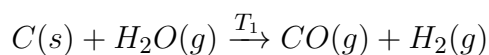
Question 9: The one that does not stabilize 2° and 3° structures of proteins is

- (1) H-bonding
 - (2) –S–S– linkage
 - (3) van der waals forces
 - (4) –O–O– linkage
-

Question 10: The compound which does not exist is

- (1) PbEt_4
 - (2) BeH_2
 - (3) NaO_2
 - (4) $(\text{NH}_4)_2\text{BeF}_4$
-

Question 11: Given below are two reactions, involved in the commercial production of dihydrogen (H_2). The two reactions are carried out at temperature “ T_1 ” and “ T_2 ”, respectively



The temperatures T_1 and T_2 are correctly related as

- (1) $T_1 = T_2$
- (2) $T_1 < T_2$
- (3) $T_1 > T_2$

(4) $T_1 = 100 \text{ K}$, $T_2 = 1270 \text{ K}$

Question 12: The enthalpy change for the adsorption process and micelle formation respectively are

- (1) $\Delta H_{ads} < 0$ and $\Delta H_{mic} < 0$
 - (2) $\Delta H_{ads} > 0$ and $\Delta H_{mic} < 0$
 - (3) $\Delta H_{ads} < 0$ and $\Delta H_{mic} > 0$
 - (4) $\Delta H_{ads} > 0$ and $\Delta H_{mic} > 0$
-

Question 13: The pair from the following pairs having both compounds with net non-zero dipole moment is

- (1) cis-butene, trans-butene
 - (2) Benzene, anisidine
 - (3) CH_2Cl_2 , CHCl_3
 - (4) 1,4-Dichlorobenzene, 1,3-Dichlorobenzene
-

Question 14: Which of the following is used as a stabilizer during the concentration of sulphide ores?

- (1) Xanthates
 - (2) Fatty acids
 - (3) Pine oils
 - (4) Cresols
-

Question 15: Which of the following statements are correct?

- (A) The $\text{M}^{3+}/\text{M}^{2+}$ reduction potential for iron is greater than manganese
- (B) The higher oxidation states of first row d-block elements get stabilized by oxide ion.
- (C) Aqueous solution of Cr^{2+} can liberate hydrogen from dilute acid.
- (D) Magnetic moment of V^{2+} is observed between 4.4-5.2 BM.

Choose the correct answer from the options given below:

- (1) (C), (D) only
- (B) (B), (C) only
- (C) (A), (B), (D) only

(D) (A), (B) only

Question 16: Given below are two statements:

Statement I: Aqueous solution of $K_2Cr_2O_7$ is preferred as a primary standard in volumetric analysis over $Na_2Cr_2O_7$ aqueous solution.

Statement II: $K_2Cr_2O_7$ has a higher solubility in water than $Na_2Cr_2O_7$.

In the light of the above statements, choose the correct answer from the options given below:

- (1) Statement I is false but Statement II is true
- (2) Statement I is true but Statement II is false
- (3) Both Statement I and Statement II are true
- (4) Both Statement I and Statement II are false

Question 17: The octahedral diamagnetic low spin complex among the following is

- (1) $[CoF_6]^{3-}$
- (2) $[CoCl_6]^{3-}$
- (3) $[Co(NH_3)_6]^{3+}$
- (4) $[NiCl_4]^{2-}$

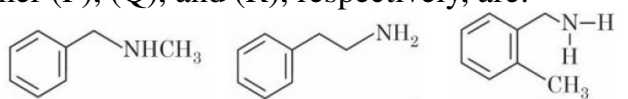
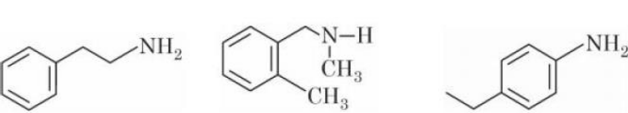
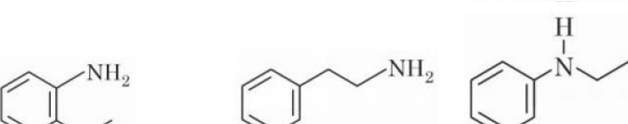
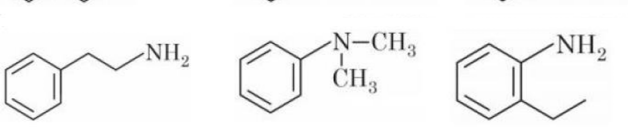
Question 18: Isomeric amines with molecular formula $C_8H_{11}N$ given the following tests:

Isomer (P): Can be prepared by Gabriel phthalimide synthesis.

Isomer (Q): Reacts with Hinsberg's reagent to give a solid insoluble in NaOH.

Isomer (R): Reacts with HONO followed by β -naphthol in NaOH to give a red dye.

Isomer (P), (Q), and (R), respectively, are:

- (1) 
- (2) 
- (3) 
- (4) 

Question 19: The number of molecules and moles in 2.8375 litres of O_2 at STP are respectively

- (1) 7.527×10^{22} and 0.125 mol
 - (2) 1.505×10^{23} and 0.250 mol
 - (3) 7.527×10^{23} and 0.125 mol
 - (4) 7.527×10^{22} and 0.250 mol
-

Question 20: Match List I with List II

List I	Polymer	List II
(A)	Nylon-2-Nylon-6	(I) Thermosetting polymer
(B)	Buna-N	(II) Biodegradable polymer
(C)	Urea-Formaldehyde resin	(III) Synthetic rubber
(D)	Dacron	(IV) Polyester

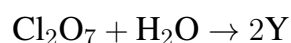
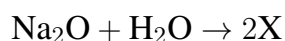
Choose the correct answer from the options given below:

- (1) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
 - (2) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
 - (3) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
 - (4) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
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Section B

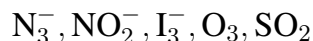
Question 21: If the degree of dissociation of an aqueous solution of weak monobasic acid is determined to be 0.3, then the observed freezing point will be _____ % higher than the expected/theoretical freezing point. (Nearest integer)

Question 22: In the following reactions, the total number of oxygen atoms in X and Y is _____



Question 23: The sum of lone pairs present on the central atom of the interhalogens IF_5 and IF_7 is _____

Question 24: The number of bent-shaped molecule(s) from the following is -----



Question 25: The number of correct statement(s) involving equilibria in physical from the following is -----

- (1) Equilibrium is possible only in a closed system at a given temperature.
- (2) Both the opposing processes occur at the same rate.
- (3) When equilibrium is attained at a given temperature, the value of all its parameters.
- (4) For dissolution of solids in liquids, the solubility is constant at a given temperature.

Question 26: At constant temperature, a gas is at a pressure of 940.3 mm Hg. The pressure at which its volume decreases by 40% is ----- mm Hg. (Nearest integer)

Question 27: $\text{FeO}_4^{2-} \xrightarrow{+2.2\text{ V}} \text{Fe}^{3+} \xrightarrow{+0.70\text{ V}} \text{Fe}^{2+} \xrightarrow{-0.45\text{ V}} \text{Fe}^0$

$E^\circ_{\text{FeO}_4^{2-}/\text{Fe}^{2+}}$ is $x \times 10^{-3}\text{ V}$. The value of x is -----

Question 28: A molecule undergoes two independent first-order reactions whose respective half-lives are 12 min and 3 min. If both the reactions are occurring, then the time taken for the 50% consumption of the reactant is ----- min. (Nearest integer)

Question 29: The number of incorrect statement(s) about the black body from the following is -----

- (1) Emit or absorb energy in the form of electromagnetic radiation.
- (2) Frequency distribution of the emitted radiation depends on temperature.
- (3) At a given temperature, intensity vs frequency curve passes through a maximum value.
- (4) The maximum of the intensity vs frequency curve is at a higher frequency at higher temperature compared to that at lower temperature.

Question 30: In potassium ferrocyanide, there are ----- pairs of electrons in the t_{2g} set of orbitals.
