

JEE Main 2023 April 10 Shift 1 Chemistry Question Paper

Total Time Allowed : 180 minutes	Maximum Marks : 300	Total Questions : 90	Questions to be answered : 90
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General Instructions

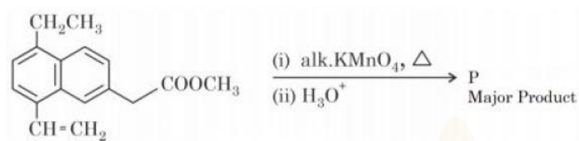
Read the following instructions very carefully and strictly follow them:

- (1) The test is of 3 hours duration.
- (2) The question paper consists of 90 questions. 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.

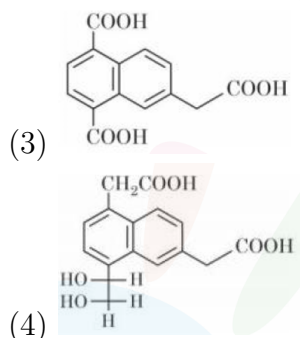
Chemistry

Section A

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



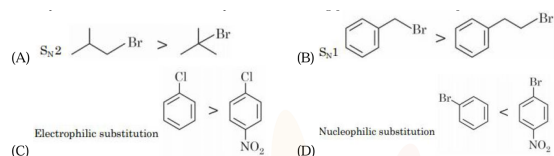
- (1)
- (2)



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

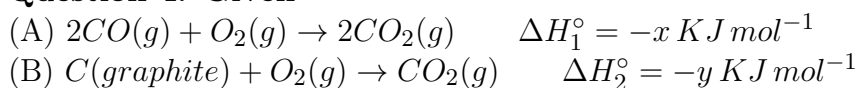
- (1) prevent hydrolysis
- (2) prevent reduction
- (3) prevent breaking
- (4) prevent oxidation

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

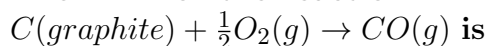


- (1) (A), (C) and (D) only
- (2) (A), (B) and (D) only
- (3) (B), (C) and (D) only
- (4) (A), (B), (C) and (D)

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

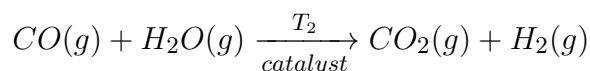
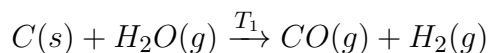
Question 9: The one that does not stabilize 2° and 3° structures of proteins is

- (1) H-bonding
- (2) $-\text{S}-\text{S}-$ linkage
- (3) van der waals forces
- (4) $-\text{O}-\text{O}-$ 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 M^{3+}/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) $[NiCl_4]^{2-}$
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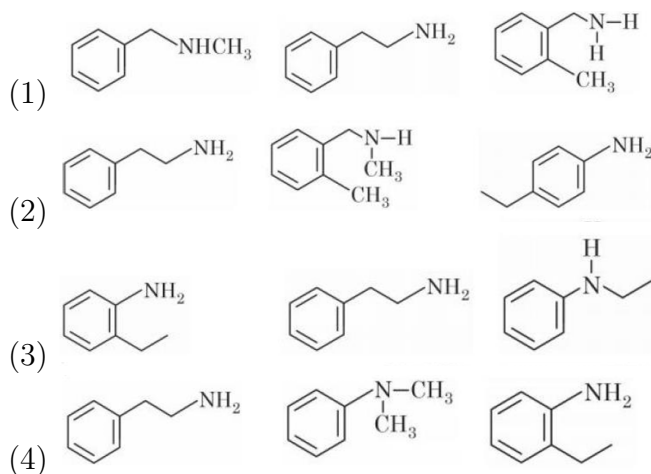
Question 18: Isomeric amines with molecular formula $C_8H_{11}N$ given the following tests:

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:



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:

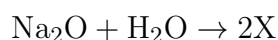
- (1) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
 (2) (A)-(II), (B)-(I), (C)-(IV), (D)-(III)
 (3) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)
 (4) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)

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

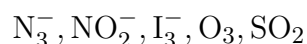
integer)

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.
