

**Questions & Answers**

Time : 3 hrs. 20 Min.

M.M. : 720

*for***NEET (UG)-2022**

Read carefully the Instructions on the Cover of this Test Booklet.

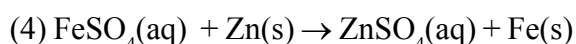
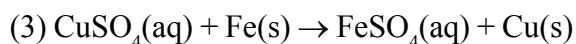
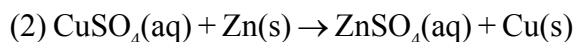
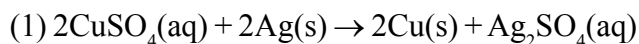
Important Instructions :

1. The test is of 3.20 hours duration and the Test Booklet contains 200 multiple choice questions (Four options with a single correct answer). There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15. (Candidates are advised to read all 15 questions in each subject of Section-B before they start attempting the question paper. In the event of a candidate attempting more than ten questions, the first ten questions answered by the candidate shall be evaluated.)
2. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For every wrong response 1 mark shall be deducted from the total scores. The maximum marks are 720.
3. Use Blue / Black Ball point Pen only for writing particulars on this page / marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must handover the Answer Sheet to the Invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The CODE for this Booklet is R3.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/ Answer Sheet. Use of white fluid for correction is NOT permissible on the Answer Sheet.
8. Each candidate must show on-demand his/her Admission Card to the Invigilator.
9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
12. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
13. The candidates will write the Correct Test Booklet Code as given in the Test Booklet / Answer Sheet in the Attendance Sheet.



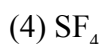
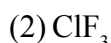
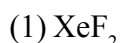
51. At 298 K, the standard electrode potentials of Cu^{2+}/Cu , Zn^{2+}/Zn , Fe^{2+}/Fe and Ag^{+}/Ag are 0.34 V, -0.76 V, -0.44 V and 0.80 V, respectively.

On the basis of standard electrode potential, predict which of the following reaction can not occur ?



Answer (1)

52. Amongst the following which one will have maximum 'lone pair - lone pair' electron repulsions ?



Answer (1)

53. The incorrect statement regarding enzymes is :

(1) Enzymes are very specific for a particular reaction and substrate.

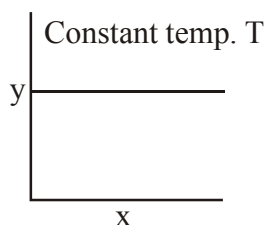
(2) Enzymes are biocatalysts.

(3) Like chemical catalysts enzymes reduce the activation energy of bio processes.

(4) Enzymes are polysaccharides.

Answer (4)

54. The given graph is a representation of kinetics of a reaction.



The y and x axes for zero and first order reactions, respectively are

(1) Zero order ($y = \text{rate}$ and $x = \text{concentration}$), first order ($y = \text{rate}$ and $x = t_{1/2}$)

(2) Zero order ($y = \text{concentration}$ and $x = \text{time}$), first order ($y = t_{1/2}$ and $x = \text{concentration}$)

(3) Zero order ($y = \text{concentration}$ and $x = \text{time}$), first order ($y = \text{rate constant}$ and $x = \text{concentration}$)

(4) Zero order ($y = \text{rate}$ and $x = \text{concentration}$), first order ($y = t_{1/2}$ and $x = \text{concentration}$)

Answer (4)



55. Given below are two statements :

Statement I :

Primary aliphatic amines react with HNO_2 to give unstable diazonium salts.

Statement II :

Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K.

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

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct but Statement II is incorrect.

Answer (4)

56. The IUPAC name of the complex -

$[\text{Ag}(\text{H}_2\text{O})_2][\text{Ag}(\text{CN})_2]$ is :

- (1) diaquasilver(I) dicyanidoargentate(I)
- (2) dicyanidosilver(II) diaquaargentate(II)
- (3) diaquasilver(II) dicyanidoargentate(II)
- (4) dicyanidosilver(I) diaquaargentate(I)

Answer (1)

57. Match List-I with List-II.

List-I (Drug class)	List-II (Drug molecule)
(a) Antacids	(i) Salvarsan
(b) Antihistamines	(ii) Morphine
(c) Analgesics	(iii) Cimetidine
(d) Antimicrobials	(iv) Seldane

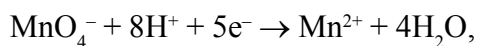
Choose the correct answer from the options given below :

- (1) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)
- (2) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)
- (3) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (iii)
- (4) (a) - (i), (b) - (iv), (c) - (ii), (d) - (iii)

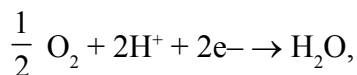
Answer (3)



58. Given below are half cell reactions :



$$E_{\text{Mn}^{2+}/\text{MnO}_4^-}^\circ = -1.510\text{V}$$



$$E_{\text{O}_2/\text{H}_2\text{O}}^\circ = +1.223\text{V}$$

Will the permanganate ion, MnO_4^- liberate O_2 from water in the presence of an acid ?

(1) No, because $E_{\text{cell}}^\circ = -2.733\text{V}$

(2) Yes, because $E_{\text{cell}}^\circ = +0.287\text{V}$

(3) No, because $E_{\text{cell}}^\circ = -0.287\text{V}$

(4) Yes, because $E_{\text{cell}}^\circ = +2.733\text{V}$

Answer (2)

59. Match List-I with List-II.

List-I

List-II

(Products formed)

(Reaction of carbonyl compound with)

(a) Cyanohydrin

(i) NH_2OH

(b) Acetal

(ii) RNH_2

(c) Schiff's base

(iii) alcohol

(d) Oxime

(iv) HCN

Choose the correct answer from the options given below :

(1) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)

(2) (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)

(3) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)

(4) (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)

Answer (1)

60. $\text{RMgX} + \text{CO}_2 \xrightarrow[\text{ether}]{\text{dry}} \text{Y} \xrightarrow{\text{H}_3\text{O}^+} \text{RCOOH}$. What is Y in the above reaction ?

(1) $(\text{RCOO})_2\text{Mg}$

(2) $\text{RCOO}^-\text{Mg}^+\text{X}$

(3) $\text{R}_3\text{CO}^-\text{Mg}^+\text{X}$

(4) RCOO^-X^+

Answer (2)

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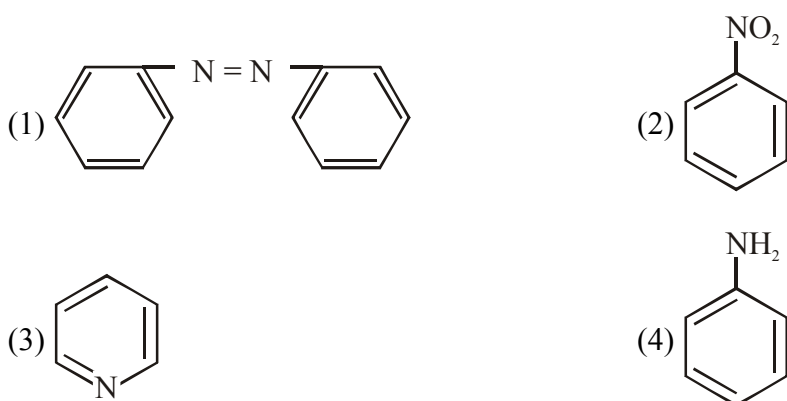
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61. Identify the incorrect statement from the following.
- (1) The shapes of d_{xy} , d_{yz} , and d_{zx} orbitals are similar to each other ; and $d_{x^2-y^2}$ and d_{z^2} are similar to each other.
 - (2) All the five 5d orbitals are different in size when compared to the respective 4d orbitals.
 - (3) All the five 4d orbitals have shapes similar to the respective 3d orbitals.
 - (4) In an atom, all the five 3d orbitals are equal in energy in free state.

Answer (1)

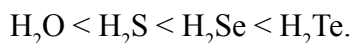
62. The Kjeldahl's method for the estimation of nitrogen can be used to estimate the amount of nitrogen in which one of the following compounds ?

**Answer (4)**

63. Given below are two statements :

Statement I :

The boiling points of the following hydrides of group 16 elements increases in the order :

**Statement II :**

The boiling points of these hydrides increase with increases in molar mass.

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

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct but Statement II is incorrect

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64. The IUPAC name of an element with atomic number 119 is :

- (1) Ununoctium (2) Ununennium
(3) Unnilennium (4) Unununnium

Answer (2)

65. Match List-I with List-II.

List-I

- (a) Li
(b) Na
(c) KOH
(d) Cs

List-II

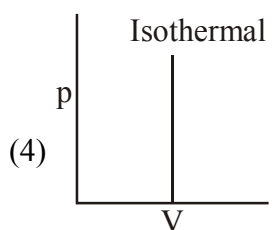
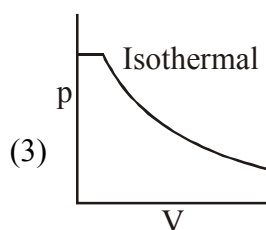
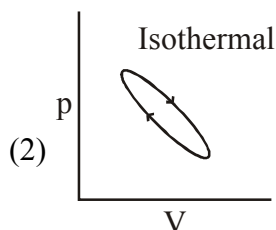
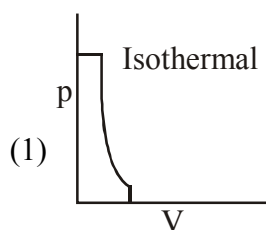
- (i) Absorbent for carbon dioxide
(ii) Electrochemical cells
(iii) Coolant in fast breeder reactors
(iv) Photoelectric cell

Choose the correct answer from the options given below :

- (1) (a) - (ii), (b) - (iii), (c) - (i), (d) - (iv) (2) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)
(3) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i) (4) (a) - (i), (b) - (ii), (c) - (iv), (d) - (ii)

Answer (1)

66. Which of the following P-V curve represents maximum work done ?



Answer (3)

67. Which amongst the following is incorrect statement ?

- (1) O_2^+ ion is diamagnetic.
(2) The bond orders of O_2^+ , O_2 , O_2^- and O_2^{2-} are 2.5, 2, 1.5 and 1, respectively
(3) C_2 molecule has four electrons in its two degenerate π molecular orbitals.
(4) H_2^+ ion has one electron.

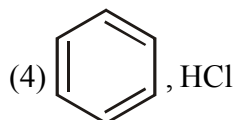
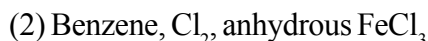
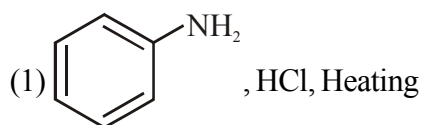
Answer (1)

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68. Which of the following is suitable to synthesize chlorobenzene ?



Answer (2)

69. Match List-I with List-II.

List-I

(Hydrides)

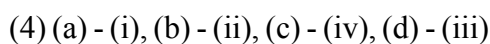
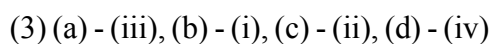
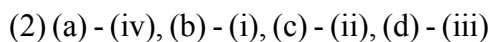
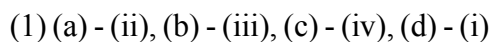
- (a) MgH_2
- (b) GeH_4
- (c) B_2H_6
- (d) HF

List-II

(Nature)

- (i) Electron precise
- (ii) Electron deficient
- (iii) Electron rich
- (iv) Ionic

Choose the correct answer from the options given below :



Answer (2)

70. Given below are two statements :

Statements I :

In the coagulation of a negative sol, the flocculation power of the three given ions is in the order -
 $\text{Al}^{3+} > \text{Ba}^{2+} > \text{Na}^+$

Statement II :

In the coagulation of a positive sol, the flocculation power of the three given salts is in the order -
 $\text{NaCl} > \text{Na}_2\text{SO}_4 > \text{Na}_3\text{PO}_4$

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

- (1) Statement I is incorrect but Statement II correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct but Statement II incorrect.

Answer (4)

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71. Which one is not correct mathematical equation for Dalton's Law of partial pressure ? Here p = total pressure of gaseous mixture

(1) $p_i = x_i p_i^\circ$, where x_i = mole fraction of i^{th} gas in gaseous mixture p_i° = pressure of i^{th} gas in pure state

(2) $p = p_1 + p_2 + p_3$

(3) $p = n_1 \frac{RT}{V} + n_2 \frac{RT}{V} + n_3 \frac{RT}{V}$

(4) $p_i = x_i p$, where p_i = partial pressure of i^{th} gas x_i = mole fraction of i^{th} gas in gaseous mixture

Answer (1)

72. The incorrect statement regarding chirality is :

(1) A racemic mixture shows zero optical rotation.

(2) S_N1 reaction yields 1 : 1 mixture of both enantiomers.

(3) The product obtained by S_N2 reaction of haloalkane having chirality at the reactive site shows inversion of configuration.

(4) Enantiomers are superimposable mirror images on each other.

Answer (4)

73. Which of the following statements is not correct about diborane ?

(1) Both the Boron atoms are sp^2 hybridised.

(2) There are two 3-centre-2-electron bonds.

(3) The four terminal B-H bonds are two centre two electron bonds.

(4) The four terminal Hydrogen atoms and the two Boron atoms lie in one plane.

Answer (1)

74. Identify the incorrect statement from the following

(1) Lithium is the strongest reducing agent among the alkali metals.

(2) Alkali metals react with water to form their hydroxides

(3) The oxidation number of K in KO_2 is +4

(4) Ionisation enthalpy of alkali metals decreases from top to bottom in the group.

Answer (3)

75. Which statement regarding polymers is not correct ?

(1) Thermosetting polymers are reusable.

(2) Elastomers have polymer chains held together by weak intermolecular forces.

(3) Fibers possess high tensile strength.

(4) Thermoplastic polymers are capable of repeatedly softening and hardening on heating and cooling respectively.

Answer (1)

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76. The pH of the solution containing 50 mL each of 0.10 M sodium acetate and 0.01 M acetic acid is

[Given pK_a of $CH_3COOH = 4.57$]

- (1) 2.57 (2) 5.57
(3) 3.57 (4) 4.57

Answer (2)

77. What mass of 95% pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction



[Calculate upto second place of decimal point]

- (1) 9.50 g (2) 1.25 g
(3) 1.32 g (4) 3.65 g

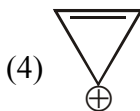
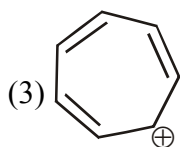
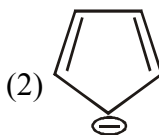
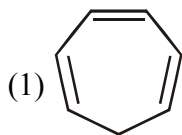
Answer (3)

78. Choose the correct statement :

- (1) Both diamond and graphite are used as dry lubricants.
(2) Diamond and graphite have two dimensional network
(3) Diamond is covalent and graphite is ionic
(4) Diamond is sp^3 hybridised and graphite is sp^2 hybridized

Answer (4)

79. Which compound amongst the following is not an aromatic compound ?



Answer (1)



80. Given below are two statements :

Statement I : The boiling points of aldehydes and ketones are higher than hydrocarbons of comparable molecular masses because of weak molecular association in aldehydes and ketones due to dipole - dipole interactions.

Statement II : The boiling points of aldehydes and ketones are lower than the alcohols of similar molecular masses due to the absence of H-bonding.

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

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct.
- (3) Both Statement I and Statement II are incorrect.
- (4) Statement I is correct but Statement II is incorrect.

Answer (2)

81. Gadolinium has a low value of third ionisation enthalpy because of

- (1) high basic character
- (2) small size
- (3) high exchange enthalpy
- (4) high electronegativity

Answer (3)

82. Given below are two statements : one is labelled as :

Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : ICl is more reactive than I₂.

Reason (R) : I-Cl bond is weaker than I-I bond.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

- (1) (A) is not correct but (R) is correct
- (2) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- (4) (A) is correct but (R) is not correct.

Answer (2)



83. Given below are two statements : One is labelled as

Assertion (A) : and the other is labelled as Reason (R).

Assertion : In a particular point defect, an ionic solid is electrically neutral, even if few of its cations are missing from its unit cells.

Reason (R) : In an ionic solid, Frenkel defect arises due to dislocation of cation from its lattice site to interstitial site, maintaining overall electrical neutrality.

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

- (1) (A) is not correct but (R) is correct
- (2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
- (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- (4) (A) is correct but (R) is not correct

Answer (3)

84. In one molal solution that contains 0.5 mole of a solute, there is :

- (1) 1000 g of solvent
- (2) 500 mL of solvent
- (3) 500 g of solvent
- (4) 100 mL of solvent

Answer (3)

85. Given below are two statements :

Statement I : The acidic strength of monosubstituted nitrophenol is higher than phenol because of electron withdrawing nitro group.

Statement II : o-nitrophenol, m-nitrophenol and p-nitrophenol will have same acidic strength as they have one nitro group attached to the phenolic ring.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct.
- (3) Both Statement I and Statement II are incorrect.
- (4) Statement I is correct but Statement II is incorrect.

Answer (4)

**SECTION B**

86. Given below are two statements :

Statement I : In Lucas test, primary, secondary and tertiary alcohols are distinguished on the basis of their reactivity with conc. $\text{HCl} + \text{ZnCl}_2$, known as Lucas Reagent.

Statement II : Primary alcohols are most reactive and immediately produce turbidity at room temperature of reaction with Lucas reagent.

In the light of the above statements, choose the **most appropriate** answer from the options given below

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct.
- (3) Both Statement I and Statement II are incorrect.
- (4) Statement I is correct but Statement II is incorrect.

Answer (4)

87. Match List-I with List-II.

List-I (Ores)

List-II (Composition)

- (a) Haematite
- (b) Magnetite
- (c) Calamine
- (d) Kaolinite

- (i) Fe_3O_4
- (ii) ZnCO_3
- (iii) Fe_2O_3
- (iv) $[\text{Al}_2(\text{OH})_4\text{Si}_2\text{O}_5]$

Choose the correct answer from the options give below :

- (1) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)
- (2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
- (3) (a)-(iii), (b)-(i), (c)-(ii), (d)-(iv)
- (4) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

Answer (3)

88. $3\text{O}_2(\text{g}) \rightleftharpoons 2\text{O}_3(\text{g})$

For the above reaction at 298 K, K_c is found to be 3.0×10^{-59} . If the concentration of O_2 at equilibrium is 0.040 M then concentration of O_3 in M is :

- (1) 1.2×10^{21}
- (2) 4.38×10^{-32}
- (3) 1.9×10^{-63}
- (4) 2.4×10^{31}

Answer (2)

89. For a first order reaction $\text{A} \rightarrow \text{Products}$, initial concentration of A is 0.1 M, which becomes 0.001 M after 5 minutes. Rate constant for the reaction for the reaction in min^{-1} is :

- (1) 0.2303
- (2) 1.3818
- (3) 0.9212
- (4) 0.4606

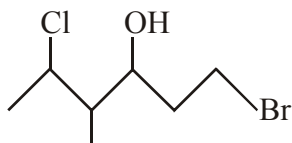
Answer (3)

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90. The correct IUPAC name of the following compound is :



- (1) 6-bromo-4-methyl-2-chlorohexan-4-ol (2) 1-bromo-5-chloro-4-methylhexan-3-ol
 (3) 6-bromo-2-chloro-4-methylhexan-4-ol (4) 1-bromo-4-methyl-5-chlorohexan-3-ol

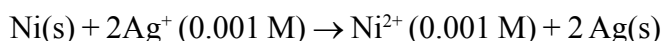
Answer (2)

91. If radius of second Bohr orbit of the He^+ ion is 105.8 pm, what is the radius of third Bohr orbit of Li^{2+} ion ?

- (1) 158.7 Å (2) 158.7 pm
 (3) 15.87 pm (4) 1.587 pm

Answer (2)

92. Find the emf of the cell in which the following reaction takes place at 298 K



(Given that $E_{\text{cell}}^{\circ} = 1.05 \text{ V}$, $\frac{2.303 RT}{F} = 0.059$ at 298 K)

- (1) 1.05 V (2) 1.0385 V
 (3) 1.385 V (4) 0.9615 V

Answer (Bonus)

93. A 10.0 L flask contains 64 g of oxygen at 27°C . (Assume O_2 gas is behaving ideally). The pressure inside the flask in bar is

(Given $R = 0.0831 \text{ L bar K}^{-1} \text{ mol}^{-1}$)

- (1) 4.9 (2) 2.5
 (3) 498.6 (4) 49.8

Answer (1)

94. The order of energy absorbed which is responsible for the colour of complexes

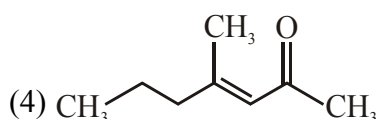
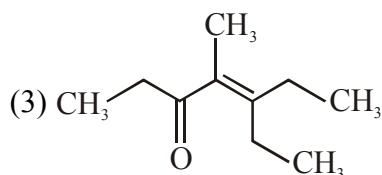
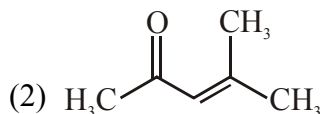
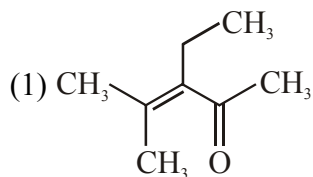


- (1) (B) > (A) > (C) (2) (A) > (B) > (C)
 (3) (C) > (B) > (A) (4) (C) > (A) > (B)

Answer (4)



95. Which one of the following is not formed when acetone reacts with 2-pentanone in the presence of dilute NaOH followed by heating ?



Answer (3)

96. In the neutral or faintly alkaline medium, KMnO_4 oxidises iodide into iodate. The change in oxidation state of manganese in this reaction is from :

(1) +6 to +5

(2) +7 to +4

(3) +6 to +4

(4) +7 to +3

Answer (2)

97. The pollution due to oxides of sulphur gets enhanced due to the presence of :

(a) particulate matter

(b) ozone

(c) hydrocarbons

(d) hydrogen peroxide

Choose the **most appropriate** answer from the options given below :

(1) (a), (c), (d) only

(2) (a), (d) only

(3) (a), (b), (d) only

(4) (b), (c), (d) only

Answer (3)

98. Copper crystallises in fcc unit cell with cell edge length of 3.608×10^{-8} cm. The density of copper is 8.92 g cm^{-3} . Calculate the atomic mass of copper.

(1) 65 u

(2) 63.1 u

(3) 31.55 u

(4) 60 u

Answer (2)

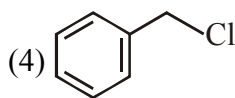
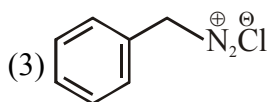
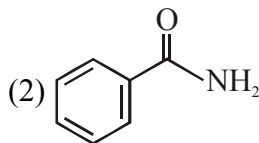
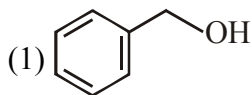
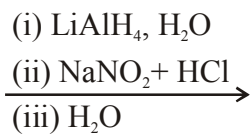
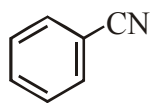
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99. The product formed from the following reaction sequence is :



Answer (1)

100. Compound X on reaction with O_3 followed by $\text{Zn}/\text{H}_2\text{O}$ gives formaldehyde and 2-methyl propanal as products.

The compound X is :

(1) Pent-2-en

(2) 3-Methylbut-1-ene

(3) 2-Methylbut-1-ene

(4) 2-Methylbut-2-en

Answer (2)