CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

MOCK TEST 2

Mcqs

1. If $'a'$ stands for the edge length of the cubic systems: simple cubic,body centred cubic and face

centred cubic then the ratio of radii of the spheres

inthese systems will be respectively,

A. $\dfrac{1}{a} : \dfrac{\sqrt{3}}{4}a : \dfrac{1}{2\sqrt{2}}a$

B. $\dfrac{1}{2}a : \dfrac{\sqrt{3}}{4}a : \dfrac{1}{2\sqrt{2}}a$

C. $\dfrac{1}{2}a : \dfrac{\sqrt{3}}{2}a : \dfrac{\sqrt{2}}{2}a$

D. $1a : \sqrt{3}a : \sqrt{2}a$

Answer: A

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2. $1.520g$ of the hydroxide of a metal on ignition gave $0.995g$ of oxide. The equivalent weight of metal is

A. 1.52

B. 0.995

C. 19

D. 9

Answer: D

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3. Equimolal solutions in the same solvents have :

A. sam boiling points but difference freezing
points

B. same freezing points, but different boilinlg
points

C. same boiling points and same freezing points

D. different boiling points and different freezing
points.

Answer: C

4. A substance (A) is completely trimerised on dissolution in solvent B. The van't Hoff factor (i) for such change is:

A. 1

B. 2

C. 3

D. $1/3$

Answer: D

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5. Mole fraction of vapour of A above solution in mixture of A and $B(X_A = 0.4)$ will be $\left(P_A^\circ = 100mm, P_B^\circ = 200mm\right)$:

A. 0.4

B. 0.8

C. 0.25

D. none of these

Answer: C

6. the magnitude of surface tension of liquid dpends on the attractive forces between the molecules. Arrange the following in increasing order of surface tension :

Water,   alcohol (C_2H_5OH) and   hexane $[CH_3(CH_2)_4CH_3)]$.

A. Water $<$ alcohol $<$ hexane

B. hexane $<$ alcohol $<$ water

C. alcohol $<$ water $<$ hexane

D. hexane $<$ water $<$ alcohol

Answer: B

7. The chemical process in the production of steel from haematite ore involves

A. Reduction

B. Oxidation

C. Reduction followed by oxidation

D. Oxidation followed by reduction

Answer: A

8. For an ionic solid of the general formula AB and coordination number 6, the value of ther radius ratio will be:

A. greater than 0.73

B. between 0.73 and 0.41

C. between 0.41 and 0.22

D. less than 0.22

Answer: B

9. Which one of the following statement is false?

A. Work is a state function

B. temperature is a state function

C. change in the state is completely defined when intial and final states are specified

D. work appears at the boundary of the system

Answer: A

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10. A gas expands isothermally and reversibly. The work done by the gas is

A. zero

B. minimum

C. maximum

D. equal to work done

Answer: C

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11. The enthalpy change for a reaction does not depend upon:

    A. the nature of intermediate state

    B. the differences in initial and final temperature

    C. the physical state of reactants and product

    D. use of different reactants for same reaction

Answer: A

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12. Molar heat capacity of water in equilibrium with the ice at constant pressure is :

A. zero

B. infinity (∞)

C. 40.45 kJ $K^{-1}mol^{-1}$

D. 75.48 $JK^{-1}mol^{-1}$.

Answer: B

13. A reaction involiving two different reactants can never be:

    A. unimolecular reaction

    B. first order reaction

    C. second order reaction

    D. bimolecular reaction

Answer: A

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14. Two hybrid orbitals have a bond angle of $120°$. The percentage of s-character in the hybrid orbitals is nealy:

A. 0.25

B. 0.33

C. 0.5

D. 0.66

Answer: B

15. In a first order reaction, the concentration of the reactant decreases form 800mol dm^{-3} to 50mol dm^{-3} in $2 \times 10^4 s$. The rate constant of the reaction (in s^{-1}) is

    A. 2×10^4

    B. 3.45×10^{-5}

    C. 1.386×10^{-4}

    D. 2×10^{-4}

Answer: C

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16. One mole of N_2H_4 loses ten moles of electrons to form a new compound A. Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in A? (There is no change in the oxidation state of hydrogen.)

A. -1

B. -3

C. $+3$

D. $+5$

Answer: C

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17. The auto reduction process is not used in the metallurgy of

   A. Hg

   B. Cu

   C. Pb

   D. Fe

Answer: D

18. PCl_3 reacts with water to form :

A. PH_3

B. H_3PO_3, HCl

C. $POCl_3$

D. H_3PO_4
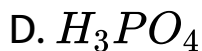
Answer: B

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19. Noble gases do not react with other elements

because

A. they are monoatomic

B. they are found in abundance

C. the sizez of their atoms is very small

D. they are completely paired up and have stable

electron shell

Answer: D

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20. Which of the following phosphorus is the most

reactive?

A. Red phosphorus

B. White phosphorus

C. Scarlet phosphorus

D. Violet phosphorus

Answer: B

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21. Oxidation number of P in PO_4^{3-}, of S in SO_4^{2-}

and that of $Cr_2O_7^{2-}$ are respectively

A. $+5, +6$ and $+6$

B. $+3, +6$ and $+5$

C. $+5, +3$ and $+6$

D. $-3, +6$ and $+6$

Answer: A

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22. When HCl gas is passed through propene in the presence of benzoyl peroxide, it gives :

A. 2-chloropropene

B. alkyl chloride

C. no reaction

D. n-propyl chloride

Answer: A

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23. What will be the Freundlich's adsorption isotherm equation at high pressure?

A. $\dfrac{x}{m} = k$

B. $\dfrac{x}{m} = kp^{1/n}$

C. $\dfrac{x}{m} = kp$

D. None of these

Answer: A

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24. The magnetic moment of a complex ion is

$2.83 BM$ The complex ion is

(a) $[Cr(H_2O)_6]^{3+}$

(b) $[Cu(CN)_6]^{2-}$

(c) $[V(H_2O)_6]^{3+}$

(d) $[MnCI_4]^{2-}$.

A. $[V(H_2O)_6]^{3+}$

B. $[Cr(H_2O)_6]^{3+}$

C. $[Cu(CN)_4]^{2-}$

D. $[MnCl_4]^{2-}$
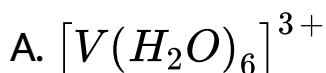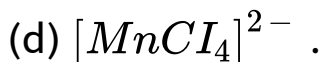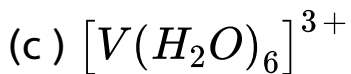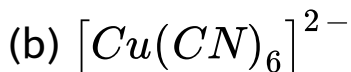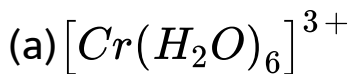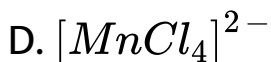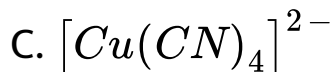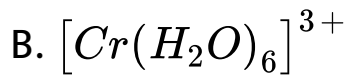
Answer: A

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25. A biological catalyst is

A. ann amino acid

B. a carbohydrate

C. a nitrogenn molecule

D. an enzyme

Answer: D

26. The transition elements have a general electronic configuration:

A. $ns^2np^6nd^{1-10}$

B. $(n-1)d^{1-10}, ns^{0-2}, np^{0-6}$
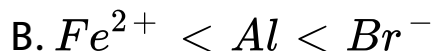
C. $(n-1)d^{1-10}, ns^{1-2}$

D. $nd^{1-10}ns^2$
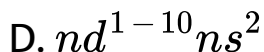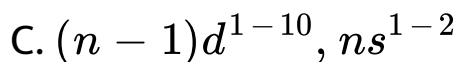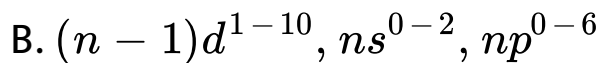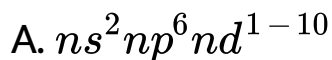
Answer: C

27. Electrode potential data are given below:

$$Fe^{3+}(aq) + e^- \rightarrow Fe^{2+}(aq) : E^\circ = +0.77V$$

$$Al^{3+} + 3e^- \rightarrow Al(s) : E^\circ = -1.66V$$

$$Br_2(aq) + 2e^- \rightarrow 2Br^-(aq) : E^\circ = +1.08V,$$
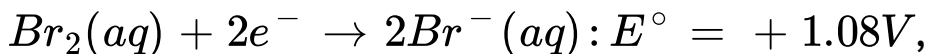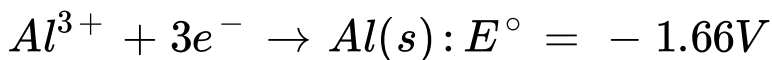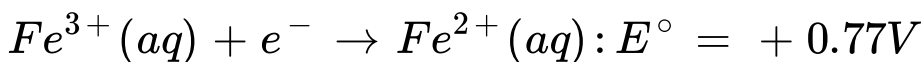
Based on the data, the reducing power of Fe^{2+} Al and Br^- will increase in the order

A. $Br^- < Fe^{2+} < Al$

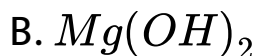B. $Fe^{2+} < Al < Br^-$

C. $Al < Br^- < Fe^{2+}$
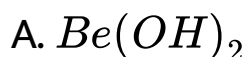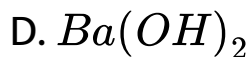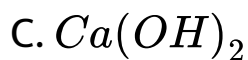
D. $Al < Fe^{2+} < Br^-$
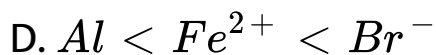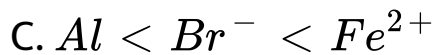
Answer: A

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28. Amphoteric hydroxides react with both alkalies and acids. Which of the following Group 2 metal hydroxides is soluble in sodium hydroxide?

A. $Be(OH)_2$
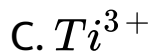
B. $Mg(OH)_2$

C. $Ca(OH)_2$

D. $Ba(OH)_2$

Answer: A

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29. Which of the following ions is the most stable in aqueous solution ?

$(At.\ No.\ Ti = 22, V = 23, Cr = 24, Mn = 25)$

A. Cr^{3+}

B. V^{3+}

C. Ti^{3+}

D. Mn^{3+}

Answer: D

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30. The number of P-O-P bonds in cyclic trimetaphosphoric acid is :

A. zero

B. two

C. three

D. four

Answer: C

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31. Select the incorrect statement about hydrides of group 15 elements.

A. The central atom in the hydride is sp^2-hybridised

B. NH_3 readily from NH_4^+ salts with H^+, PH_4^+ salts are formed with H^+ under
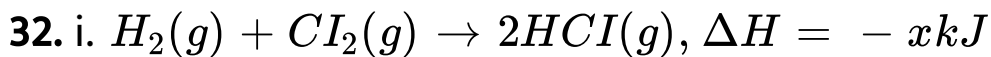
anhydrous condition

C. The tetrahedron is distorted due to repulsion between the lone pair of electrons and the bond pairs

D. The bond energy of the M-H bond decreases from NH_3 to BiH_3, because of increase in the size of the element.

Answer: A

32. i. $H_2(g) + CI_2(g) \rightarrow 2HCI(g), \Delta H = -xkJ$

ii.

$NaCI + H_2SO_4 \rightarrow NaHSO_4 + HCI, \Delta H = -ykJ$

iii. $2H_2O + 2CI_2 \rightarrow 4HCI + O_2, \Delta H = -zkJ$

From the above equations, the value of ΔH of

HCI is

   A. $-xkJ$

   B. $-ykJ$

   C. $-zkJ$

   D. $-x\,/\,2kJ$

Answer: D
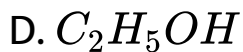
33. Which cannot undergo E2 reaction?

A.
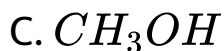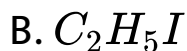
B.

C.

D. None of these

Answer: C

34. Both methane and ethane may be obtained by suitable one step reaction from

A. CH_3I

B. C_2H_5I

C. CH_3OH

D. C_2H_5OH

Answer: A

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35. The chemical reaction of acetaldehyde and ammonia results in:

A. ethylamine
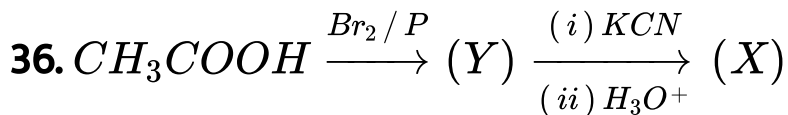
B. hexamethylene tetraamine

C. acetic acid

D. acetaldehyde ammonia

Answer: D

36. $CH_3COOH \xrightarrow{Br_2/P} (Y) \xrightarrow[(ii)\,H_3O^+]{(i)\,KCN} (X)$

Here, (X) is :

A. glycolic acid

B. α-hydroxypropionic acid

C. succinic acid

D. malonic acid

Answer: D

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37. The method of choice for determining the molecular weight of a polymer is

    A. osmotic pressure

    B. gas density

    C. lowering of freezing point

    D. direct weighing of a single molecule

Answer: A

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38. Among the following polymers, the strongest molecular forces are present in:
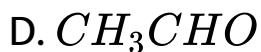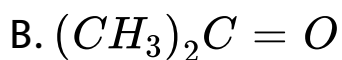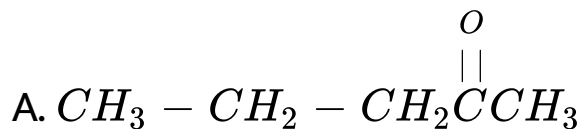
A. elastomers

B. thermoplastics

C. fibres

D. thermosetting polymers

Answer: D

39. Nucleophilic addition reaction will be most favoured in

A. $CH_3 - CH_2 - CH_2\overset{\overset{O}{\|}}{C}CH_3$

B. $(CH_3)_2 C = O$

C. $CH_3 CH_2 CHO$

D. $CH_3 CHO$

Answer: D

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40. Which of the following ether is called phenetole?

A. $PhOCH_3$

B. $PhOC_2H_5$

C. $PhOC_3H_7$

D. $p - NO_2 - C_6H_4OC_2H_5$
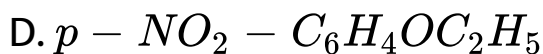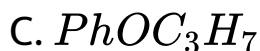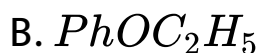
Answer: B

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41. When phenyl magnesium bromide reacts with $t-bu\tan ol$ the product would be :

A. benzene

B. phenol

C. t-butyl benzene

D. t-butyl phenyl ether

Answer: A

42. Methyl cyanide on treatment with methyl magnesium bromide followed by of subsequent hydrolysis gives:
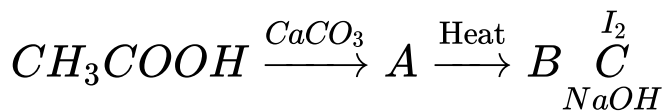
    A. propanone

    B. ethanone
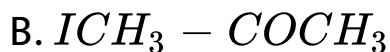
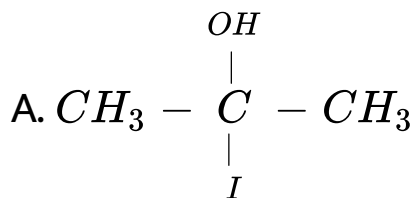   C. ethanal

    D. propanal

Answer: A

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43. Consider the following transformations

$$CH_3COOH \xrightarrow{CaCO_3} A \xrightarrow{Heat} B \quad \overset{I_2}{\underset{NaOH}{C}}$$

The molecular formula of C is

A. $CH_3 - \overset{\displaystyle OH}{\underset{\displaystyle I}{\overset{|}{C}}} - CH_3$

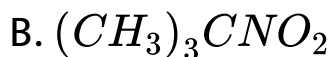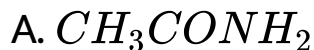B. $ICH_3 - COCH_3$

C. CHI_3

D. CHI_3I

Answer: C

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44. Which of the following cannot react with HNO_2?

A. CH_3CONH_2

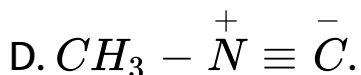B. $(CH_3)_3CNO_2$

C. $(CH_3CH_2)_2NH$
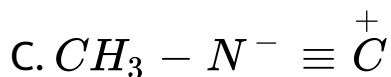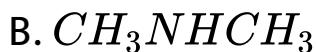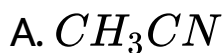
D. $CH_{30CH_2NH_2}$

Answer: B

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45. $CH_3CH_2 + CHCl_3 + KOH \rightarrow$ nitrogen containing compound $+ KCl + H_2O$. Nitrogen containing compound is

A. CH_3CN

B. CH_3NHCH_3

C. $CH_3 - \overset{-}{N} \equiv \overset{+}{C}$

D. $CH_3 - \overset{+}{N} \equiv \overset{-}{C}.$

Answer: D

46. Amides can be converted into amines by a reactions named after .

    A. Perkin

    B. Claisen

    C. Hofmann

    D. Kekule

Answer: C

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47. $\alpha - D$ glucose and $\beta - D$-glucose differ from each other due to the difference in one of the carbon atoms, with respect to its.

A. conformation

B. configuration

C. number of $-OH$ groups

D. size of hemiacetal ring

Answer: B

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48. Which among the following is not an essential amino acids?

    A. Tyrosine

    B. Leucine

    C. Lysine

    D. Valine

Answer: A

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49. A compound liberates CO_2 with $NaHCO_3$ and also gives colour with neutral $FeCl_3$ solution. Compound can be

A.

B.

C.

D.

Answer: B

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50. An element reacts with hydrogen to form a compound A which on treatment with water liberates hydrogen gas. The element can be

    A. chlorine

    B. selenium

    C. calcium

    D. nitrogen

Answer: C