CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

PRACTICE SET 05

Paper 1 Physics Chemistry

1. 60 mL of $\frac{N}{5}H_2SO_4$, 10 mL of $\frac{N}{2}HNO_3$, 30 mL of $\frac{N}{10}$ HCl are are mixed together. The

strength of the resulting mixture is

A. 0.10 N

B. 0.2 N

C. 0.3 N

D. 0.4 N

Answer: B

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2. An ideal gas expands from $10^{-3}m^3$ to $10^{-2}m^3$ at 300 K against a constant pressure of $10^5 Nm^{-2}$. The workdone is

A. $-10^3 kJ$

B. $10^2 kJ$

C. $-0.9kJ$

D. $-900kJ$

Answer: C

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3. 20.0 kg of $N_2(g)$ and 3.0 kg of $H_2(g)$ are mixed to produce $NH_3(g)$. The amount of $NH_3(g)$ formed is

A. 17 kg

B. 34 kg

C. 20 kg

D. 3 kg

Answer: A

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4. For a first order reaction, the ratio of $t_{1/2}$ to $t_{3/4}$ is

A. $2:3$

B. $3:2$

C. $1:1$

D. $1:2$

Answer: D

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5. Which will produce hard water ?

A. Saturation of water with $CaCO_3$

B. Saturation of water with $MgCO_3$

C. Saturation of water with $CaSO_4$

D. Addition of Na_2SO_4 to water

Answer: C

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6. Which is tribasic acid?

A. H_3PO_2

B. H_3PO_4

C. $H_4P_2O_7$

D. H_3PO_3

Answer: B

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7. Which of the following has the highest bond energy?

A. F_2

B. Cl_2

C. Br_2

D. I_2

Answer: B

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8. The highest oxidation state is exhibited by the transition metals with configuration:

A. $(n-1)d^3ns^2$

B. $(n-1)d^5ns^1$

C. $(n-1)d^5ns^2$

D. $(n-1)d^8ns^2$

Answer: C

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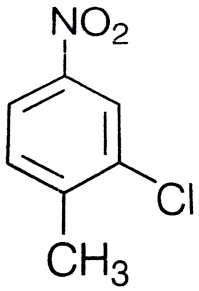
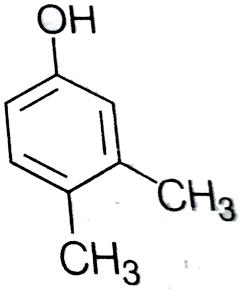
9.

(I)  and (II) 

The correct IUPAC name of the following.

are, respectively

A. 2-chloro-1-methyl-4-nitrobenzene and 3,4-dimethylphenol

B. 4-methyl-5-chloronitrobenzene and 3,4-dimethylphenol

C. 2-methyl-1-chloro-5-nitrobenzene and dimethylphenol

D. 3-chloro-4-methyl nitrobenzene and dimethylphenol.

Answer: A

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10. Absolute ether is

A. that which contains absolule alcohol

B. solution of ethers

C. free from H_2O and alcohol

D. anhydrous

Answer: C

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11. The system that forms maximum boiling azeotrope is CS_2, acetone

A. benzenen, toluene

B. acetone, chloroform

C. n-hexane, n-heptane

D.

Answer: C

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12. Ionic compounds are formed most easily with

A. low electron affinity, high ionisation energy

B. high electron affinity, low ionisation energy

C. low electron affinity, low ionisation energy

D. high electron affinity, high ionisation energy

Answer: B

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13. The function of salt bridge is

A. to provide link between two half-cells

B. to allow ions to go from one cell to another

C. to keep the emf of the cell positive

D. to maintain electrical neutrality of the solution in two half-cells

Answer: D

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14. During the kinetic study of the reaction, $2A + B \rightarrow C + D$, following results were obtained

Run	[A]/(mol/ L)	[B]/ (mol/ L)	Initial rate of formation of D (mol/L/min)
I.	0.1	0.1	6.0×10^{-3}
II.	0.3	0.2	7.2×10^{-2}
III.	0.3	0.4	2.88×10^{-1}
IV.	0.4	0.1	2.40×10^{-2}

Order of the reaction is

A. 2

B. 3

C. 1

D. 0

Answer: B

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15. The available space occupied by spheres of equal size in three dimensions in both hcp and ccp arrangement is

A. 0.74

B. 0.7

C. 0.604

D. 0.524

Answer: A

16. The final step for the extraction of copper from copper from copper pyrite in Bessmer converter involves the reaction

A. $4Cu_2 + FeS \rightarrow 8Cu + FeSO_4$

B. $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$

C. $2Cu_2O + FeS \rightarrow 4Cu + Fe + SO_2$

D.

$$Cu_2S + 2FeO \rightarrow 2Cu + 2FeCO + SO_2$$

.

Answer: B

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17. In case of nitrogen, NCl_3 is possible but not NCl_5 while in case of phosphorous, PCl_5 are possible. It is due to

A. availability of vacant d-orbitals in P but not in N

B. lower electronegativity of P than N

C. lower tendency of H-bond formation in P than N

D. occurrence of P in solid while N in gaseous state at room temperature.

Answer: A

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18. Arrange the following ions in the order of decreasing $X - O$ bond length where X is the central atom:

A. $ClO_4^- > SO_4^{2-} > PO_4^{3-} > SiO_4^{4-}$

B. $SiO_4^{4-} > PO_4^{3-} > SO_4^{2-} > ClO_4^-$

C. $SiO_4^{4-} > PO_4^{3-} > ClO_4^- > SO_4^{2-}$

D. $SiO_4^{5-} > SO_4^{2-} > PO_4^{3-} > ClO_4^-$

Answer: B

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19. Treatment of calcium carbide with water gives

A. ethene

B. ethyne

C. ethane

D. benzene

Answer: B

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20. Which of the following has highest boiling point?

A. Methoxyethane

B. Butane

C. propanol

D. propanone

Answer: C

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21. The order of osmotic prssure of equimolar solutions of $BaCl_2$, $NaCl$ and glucose will be:

A. $BaCl_2 > NaCl >$ glucose

B. $NaCl > BaCl_2$gtglucose

C. glucose $> BaCl_2 > NaCl$

D. glucose $> NaCl > BaCl_2$

Answer: A

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22. 'If a system A is in thermal equilibrium with B and B is in thermal equilibrium with C, then A and C are in thermal equilibrium with each other." This is a statement of

A. cyclic rule

B. zeroth law of thermodynamics

C. first law of thermodynamics

D. second law of thermodynamics

Answer: B

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23. The surface tension of which of the following liquid is maximum?

A. H_2O

B. C_6H_6

C. CH_3OH

D. C_2H_5OH

Answer: A

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24. A given sample of milk turns sour at room temperature $(27^\circ C)$ in five hours. In a refrigerator at $-3^\circ C$, it can be stored 10 times longer. The energy of acrivation for the souring of milk is

A. $2.303 \times 10R \quad kJ/mol$

B. $2.303 \times 5R \quad \mathrm{R} \quad kJ/mol$

C. $2.303 \times 3 \quad \mathrm{R} \quad kJ/mol$

D. $2.303 \times 2.7 \quad \mathrm{R} \quad kJ/mol$

Answer: D

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25. Oxidation number if iodine in IO_3^-, IO_4^-, KI and I_2 respectively are

A. $-1, \ -1, 0, \ +1$

B. $+3,\ +5,\ +7, 0$

C. $+5,\ +7,\ -1, 0$

D. $-1,\ -5,\ -1, 0$

Answer: C

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26. The electronic configuration of Te is

A. $[Kr]5s^2, 5p^4$

B. $[Ar]4d^{10}, 5s^2, 5p^4$

C. $[Ar]3d^{10}, 4s^2, 4p^4$

D. $[Kr]4d^{10}, 5s^2, 5p^4$

Answer: D

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27. Which of the following metal in solution forms a precipitate with $NaOH$ which is not soluble in an excess of the base?

A. Fe

B. Sn

C. Pb

D. Zn

Answer: A

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28. Elements after atomic number of 92 are called

A. Lathanoids

B. transuranic elements

C. actinoids

D. inner transition elements

Answer: B

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29. $CHCl_3 \xrightarrow{Ag\,.\,\Delta}$ ethyne, the reaction is known as

A. dehalogenation

B. decarbocation

C. dehydration

D. dehydrohalogenation

Answer: A

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30. An aldehyde that does not give red precipitate on heating with Fehling's reagent is

A. methanal

B. ethanal

C. benzaldehyde

D. propanal

Answer: C

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31. Ozone does not oxidise which one of the following

A. $FeSO_4$

B. K_2MnO_4

C. $KMnO_4$

D. All of these

Answer: C

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32. The order of acidic strenght boron trihalides is:

A. $BF_3 < BCl_3 < BBr_3 < B_3$

B. $B_3 < BBr_3 < BCl_3 < BF_3$

C. $BBr_3 < BCl_3 < BF_3 < B_3$

D. $BF_3 < B_3 < BCl_3 < BBr_3$

Answer: A

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33. Ligand(s) with lone pair of elecftron(s) with vacant orbital to receive back the electrons donated to the metal is/are

A. CO

B. H_2O

C. NH_3

D. F^-

Answer: A

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34. Dehydration of ethanol with sulphuric acid produces

A. ethylene

B. ethoxy ethane

C. mixture of ethylene and ethoxy ethane

D. ethyne

Answer: C

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35. Which of the following compound(s) is/are used to obtain acetic aciid by hydrolysis?

A. The next homologous of $CHCl_3$

B. The next homologous of HCN

C. The next homologous of formamide

D. all of the above

Answer: D

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36. Which one of the following tests can be used to identify primary amino group in a given organic compound

A. iodoform test

B. victor meyer's test

C. carbylamine reaction

D. Leibermann's reaction

Answer: C

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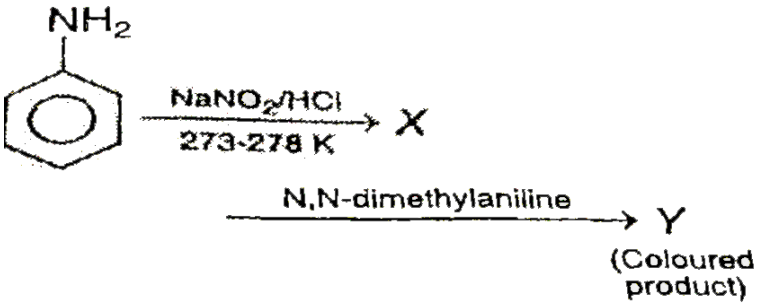
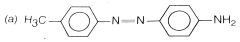
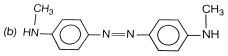
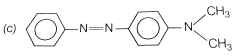
37. Aniline yields a coloured product Y through the following series of reaction:

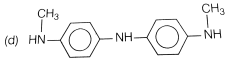


The structure of Y is

A. 

B. 

C. 

D. 

Answer: C

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38. Correct order of calorific value is

A. fatsgtcarbohydratesgtproteins

B. proteinsgtcarbohydratesgtfats

C. carbohydratesgtfatsgtproteins

D. None of these above

Answer: A

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39. Order of stability of vinyl , allyl, tertiary radicals is

A. tertiary, viinyl, allyl

B. vinyl, tertiary, allyl

C. tertiary, allyl, vinyl

D. allyl, teritary, vinyl

Answer: D

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40. Phenacetin is an example of

A. antibiotic

B. anaesthetic

C. antipyretic

D. antiseptic

Answer: C

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41. On heating, chloric acid decomposes to

A. $HClO_4, Cl_2, O_2$ and H_2O

B. $HClO_2, Cl_2, O_2$ and H_2O

C. $HClO, Cl_2O$ and H_2O_2

D. $HCl, HClO_2, Cl_2O$ and H_2O

Answer: A

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42. Merthyl bromide is converted into ethan by heating it in ether medium with:

A. Al

B. Zn

C. Na

D. Cu

Answer: C

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43. EDTA is a/an

A. monodentate ligand

B. bidentate ligand

C. tridentate ligand

D. hexadentate ligand

Answer: D

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44. Phenol gives 2,4,6-tribromophenol when treated with bromine in aqueous solution but only o- and p-bromophenol in CCl_4 solution because

A. in aqueous solution, the bromine is ionised

B. in aqueous solution, phenol exists in equilibrium with phenoxide ion which has more activating effect

C. in CCl_4, the electrophilicity of Br_2 increases

D. In CCl_4, the other position of benzene rings are blocked by the solvent.

Answer: B

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45. Acetic acid on reaction with PCl_5 gives compound.

A. $CH_3COOPCl_3$

B. CH_3COOCl

C. CH_3COCl

D. $ClCH_2COOH$

Answer: C

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46. Mendius reaction involves the reduction of-

A. cyanoalkanes

B. alkyl isocyanides

C. oximes

D. nitroalkanes

Answer: A

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47. The structural feature which distinguishes proline from other natural α-amino acids is

A. it is optically inactive

B. it contains aromatic group

C. it contains two amino groups

D. it is a secondary amine

Answer: D

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48. Glyptal polymer is obtained from glycerol on reacting with:

A. malonic acid

B. phthalic acid

C. maleic acid

D. terephthalic acid

Answer: B

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49. Hydrogen peroxide is used as an antiseptic under the name of

A. iodoform

B. perhydrol

C. hydrol

D. none of these

Answer: B

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50. Following reaction is catalysed by Br^-

$$2H_2O_2(aq) \rightarrow 2H_2O(/) + O_2(g)$$

This is an example of

A. homogeneous catalysis

B. heterogeneous catalysis

C. autocatalysis

D. enzyme catalysis

Answer: A

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