

## CHEMISTRY

### BOOKS - BITSAT GUIDE

### SOLVED PAPER 2018

#### Chemistry Part II

1. A metallic element has a cubic lattice. Each edge of the unit cell is  $2\text{\AA}$ . The density of the metal is  $2.5\text{ g cm}^{-3}$ . The unit cells in 200g of the metal are

A.  $1 \times 10^{24}$

B.  $1 \times 10^{22}$

C.  $1 \times 10^{20}$

D.  $1 \times 10^{25}$

**Answer: D**



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2. Four gases P, Q, R and S have almost same values of 'b' but their 'a' values (a, b are van der Waals constants) are in the order  $Q < R < S < P$ . At a particular temperature, among the four gases the most easily liquefiable one is

A. P

B. Q

C. R

D. S

**Answer: A**



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3. If  $\left( \frac{0.51 \times 10^{-10}}{4} \right)$  m is the radius of smallest electron orbit in hydrogen like atom, then this atom is.

A. hydrogen atom

B.  $He^+$

C.  $Li^{2+}$

D.  $Be^{3+}$

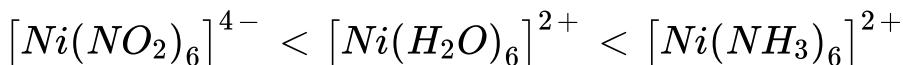
**Answer: D**

4. The correct order for the wavelength of absorption in the visible region is

A.



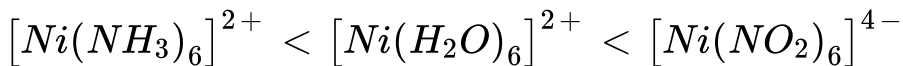
B.



C.



D.

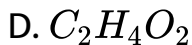
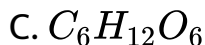
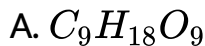


**Answer: A**



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5. The empirical formula and molecular mass of a compound are  $CH_2O$  and 180 g respectively. What will be the molecular formula of the compound ?



**Answer: C**



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6. In the correct of the Hall-Heroult process for the extraction of  $Al$ , which of the following statements is false ?

A.  $CO$  and  $CO_2$  are produced in the process.

B.  $Al_2O_3$  is mixed with  $CaF_2$  which lowers the melting point of the mixture and brings conductivity.

C.  $Al^{3+}$  is reduced at the cathode to form  $Al$

D.  $Na_3AlF_6$  serves as the electrolyte

**Answer: D**



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7. Which test among the following is not used for the distinction among  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  aliphatic amine.

- A. Hinsberg's reagent test
- B. Carbylamine reaction
- C. Azo dye test
- D. Action with nitrous acid

**Answer: C**



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8. The incorrect statement about carbonate ( $CO_3^{2-}$ ) ion is,

- A. It has planar structure

B. It has one coordinate bond

C. It has three resonating structure

D. Hydrolysis of  $CO_3^{2-}$  ion gives basic solution

**Answer: B**



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9. Under the same reaction conditions, the initial concentration of  $1.386 \text{ mol dm}^{-3}$  of a substance becomes half in 40s and 20s through first order and zero order kinetics, respectively.

The ratio  $(k_1 / k_0)$  of the rate constants for first order ( $k_1$ ) and zero order ( $k_0$ ) of the reaction is



A.  $0.5\text{mol}^{-1}\text{dm}^3$

B.  $1.0\text{mol dm}^{-3}$

C.  $1.5\text{mol dm}^{-3}$

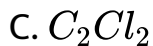
D.  $2.0\text{mol}^{-1}\text{dm}^3$

**Answer: A**



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**10. Which substance has a dipole moment ?**



D.  $C_2Cl_4$

**Answer: B**



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11. Enthalpy of combustion of methane and ethane are  $-210$  kcal/mol and  $-368$  kcal/mol respectively. The enthalpy of combustion of decane is

A.  $-1582$  kcal

B.  $-1632$  kcal

C.  $-1700$  kcal

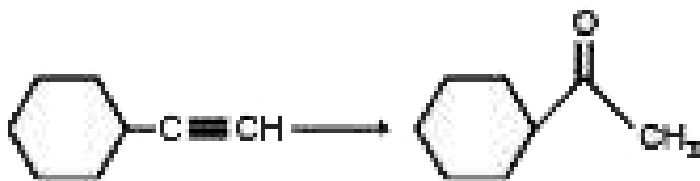
D.  $-1480$  kcal

Answer: B



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12. The correct sequence of reagents for the following conversion will be



A.  $O_3$ /Red P,  $AlCl_3$ ,  $MeCOOH$

B.  $H_2SO_4 + HgSO_4$ ,  $H_2O$ /Heat

C.  $\frac{O_3}{Zn} - AcOH$ ,  $H_2SO_4 + HgSO_4 / H_2$ /Heat

D.  $CH_3COOH$ ,  $H_2O_2 + OH^- / H_2O$

Answer: B



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13. In an atom, an electron is moving with a speed of  $600m/s$  with an accuracy of  $0.005\%$ . Certainty with which the position of the electron can be localized is :

$$(h = 6.6 \times 10^{-34} kgm^2s^{-1} ,$$

$$\text{mass of electron } (e_m) = 9.1 \times 10^{-31} kg).$$

A.  $1.52 \times 10^{-4}m$

B.  $5 \times 10 \times 10^{-3}m$

C.  $1.92 \times 10^{-3}m$

D.  $3.84 \times 10^{-3}m$

**Answer: C**



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14. Which of the following diatomic molecule would be stabilised by the removal of an electron ? .



**Answer: D**



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15.  $0.5F$  of electricity is passed through  $500\text{mL}$  of copper sulphate solution. The amount of copper which can be deposited will be

A. 63.5g

B. 31.75g

C. 15.80g

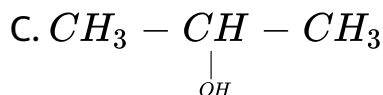
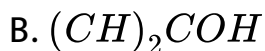
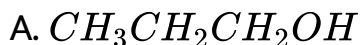
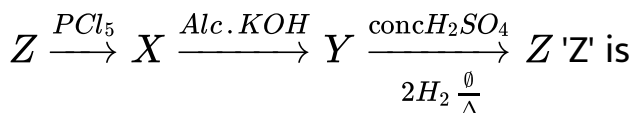
D. unpredictable

**Answer: C**



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16. Consider the following sequence of reactions.



D. None of these

**Answer: C**



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17. An equilibrium mixture at  $300K$  contains  $N_2O_4$  and  $NO_2$  at 0.28 and 1.1 atm, respectively. If the volume of container

is doubles, calculate the new equilibrium pressure of two gases.

A. 0.064 atm and 0.095 atm

B. 0.64 atm and 0.095 atm

C. 0.095 atm and 0.632 atm

D. 0.095 atm and 0.64 atm

**Answer: D**



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**18.** Which among the following actinoids does not have stable electronic configuration

A. Protactinium



B. Nobelium

C. Americium

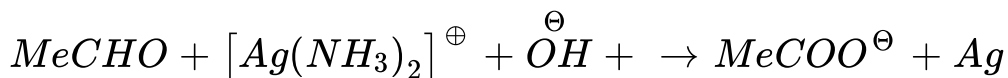
D. Lawrencium

**Answer: A**



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**19.** Which of the statements are correct about the following reactions ?



A. The equivalent weight of MeCHO is 22.

B. Three moles of  $\overline{OH}$  are required in the reaction

C. MeCHO acts as an oxidising agent

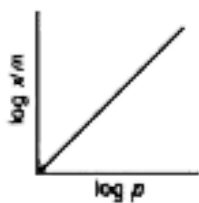
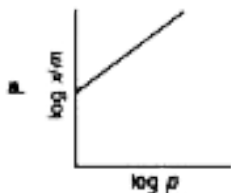
D.  $[Ag(NH_3)_2]^+$  gets reduced.

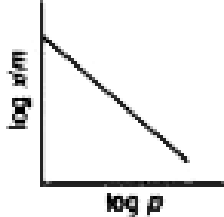
Answer: C



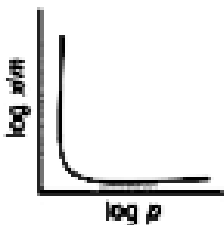
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20. Which of the following graphs represents freundlich adsorption isotherm?





C.



D.

**Answer: A**



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21. If pH of a saturated solution of  $Ba(OH)_2$  is 12, the value of its  $K_{(SP)}$  is

A.  $3.3 \times 10^{-7} M$

B.  $5.0 \times 10^{-7} M$

C.  $4.0 \times 10^{-6} M$

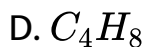
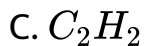
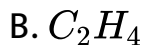
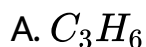
D.  $5.0 \times 10^{-6} M$

**Answer: B**



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**22.** An unsaturated hydrocarbon 'X' gives white precipitate with Tollen's reagent. If X is gaseous in nature, the molecular formula of X is



**Answer: C**



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**23.** The rate of reaction triples when temperature changes from  $20^{\circ}C$  to  $50^{\circ}C$ . Calculate the energy of activation for the reaction ( $R = 8.314 JK^{-1}mol^{-1}$ ).

A.  $181.327 Jmol^{-1}$

B.  $428.141 Jmol^{-1}$

C.  $32.4321 kJmol^{-1}$

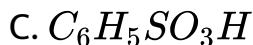
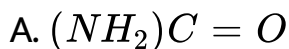
D.  $28.8118 kJmol^{-1}$

**Answer: D**



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24. Which of the following compound will give blood red colour while doing the Lassaighe's test for N?



Answer: B



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25. For a reaction,  $A + B^{2+} \rightarrow B + A^{2+}$ , at  $25^\circ C$

$E^\circ = 0.2955V$ . The value of  $K_{eq}$  is

A. 10

B.  $10^{10}$

C.  $-10$

D.  $10^{-10}$

**Answer: B**



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**26.** Which of the following is the correct order of stability of conformations for  $NH_2 - CH_2 - CH_2 - OH$

A. gauche > eclipsed > anti

B. gauche > anti > eclipsed

C. eclipsed > gauche > anti

D. anti > eclipsed > gauche

**Answer: B**



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**27.** Passing  $H_2S$  gas into a mixture of  $Mn^{2+}$ ,  $Ni^{2+}$ ,  $Cu^{2+}$  and  $Hg^{2+}$  ions in an acidified aqueous solution precipitates

A. CuS and HgS

B. MnS and CUS

C. MnS and NiS

D. NiS and HgS

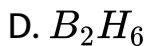
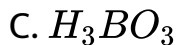
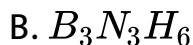
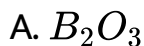


**Answer: A**



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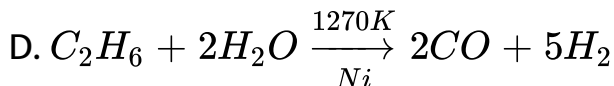
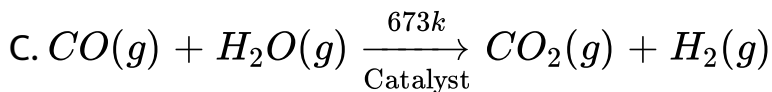
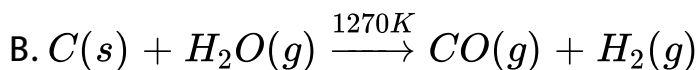
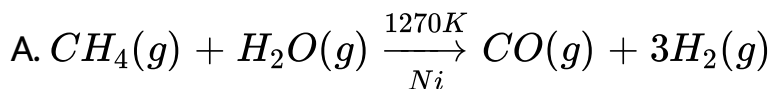
**28.** A mixture of bromo trichloride and hydrogen is subjected to silent electric discharge to form x and HCl. X is mixed with  $NH_3$  and heated to  $200^\circ C$  to form y. Then formula of y is



**Answer: B**

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29. Which of the following reaction increases, production of dihydrogen from synthesis gas ?



**Answer: C**

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30. When enthalpy and entropy change for a chemical reaction are  $-2.5 \times 10^3$  cal and  $7.4 \text{ cal deg}^{-1}$  respectively. Predict that reaction at 298 K is

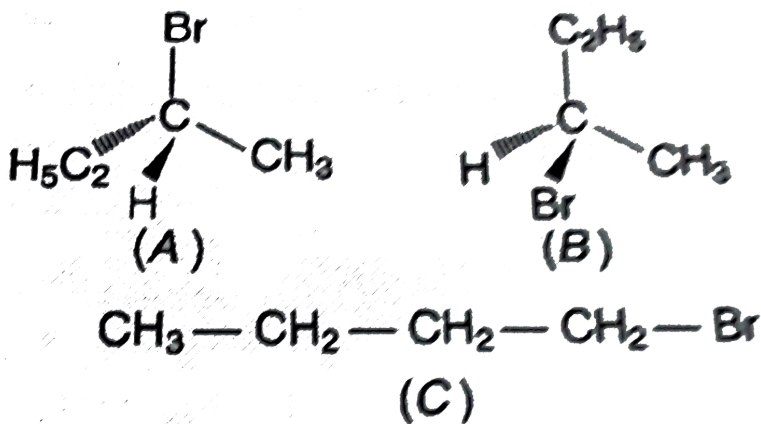
- A. reversible
- B. spontaneous
- C. non-spontaneous
- D. irreversible

**Answer: B**



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31. The addition of HBr of 1-butene gives a mixture of products A,B and C



(C)  $CH_3 - CH_2 - CH_2 - CH_2 - Br$

The mixture consists of

- A. x and y as major and z as minor products
- B. y as major, x and z as minor products
- C. y as minor, x and z as major products
- D. x and y as minor and z as major products

**Answer: A**



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32. The correct statement about silicone is

- A. They are ketones with silyl group ( $SiH_3$ ) similar to alkyl,  $(SiH_3)_2CO$
- B. They are synthetic polymer containing repeated  $R_2SiO_2$  units
- C. They are formed by hydrolysis of  $R_2SiCl_2$
- D. All of the above

Answer: C



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**33.** When dil, sulphuric acid reacts with aqueous solution of potassium chromate, the colour changes from yellow to orange. This shows that

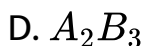
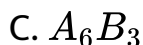
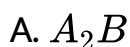
- A. Chromate ions reduced
- B. chromate ions are oxidised
- C. monocentric complex is converted into dicentric complex
- D. oxygen gets removed from chromate ions

**Answer: C**



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34. Valence electron in the element A are 3 and that in element B are 6. Most probable compound formed from A and B is



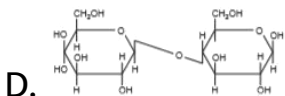
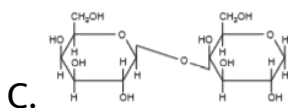
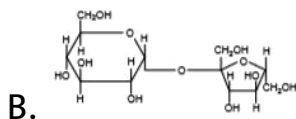
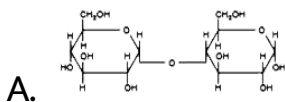
**Answer: D**



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35. In disaccharides, if the reducing groups of monosaccharides, i.e., aldehydic or ketonic groups are

bonded, these are non-reducing sugars. Which of the following disaccharide is a non-reducing sugar?



**Answer: B**

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**36.** Which of the following 0.1M aqueous solution will have lowest freezing point ?



A. Potassium sulphate

B. Sodium chloride

C. Urea

D. Glucose

**Answer: A**



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**37.** A penicillin is a member of a family of drugs that have a

A. four membered cyclic amide fused to a five membered  
thiazole ring

B. three membered cyclic amide fused to a five-membered thiazole ring

C. four-membered cyclic amide fused to have a four membered thiazole ring.

D. five -membered cyclic amide fused to have a five membered thiazole ring.

**Answer: A**



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**38.** Property of the alkaline earth metals that increases with their atomic number is

A. electronegativity

B. solubility of their hydroxides in water

C. solubility of their sulphate in water

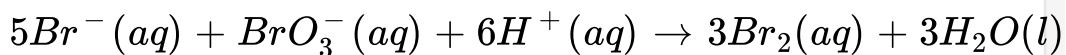
D. ionisation energy

**Answer: B**



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**39.** Which of the following expression is correct for the rate of reaction given below ?



A.  $\frac{\Delta[Br^{-}]}{\Delta t} = \frac{5}{6} \frac{\Delta[H^{+}]}{\Delta t}$

B.  $\frac{\Delta[Br^{-}]}{\Delta t} = \frac{6}{5} \frac{\Delta[H^{+}]}{\Delta t}$

$$\text{C. } \frac{\Delta[\text{Br}^-]}{\Delta t} = \frac{5\Delta[\text{H}^+]}{\Delta t}$$

$$\text{D. } \frac{\Delta[\text{Br}^-]}{\Delta t} = \frac{6\Delta[\text{H}^+]}{\Delta t}$$

**Answer: A**



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**40.** Match the polymer given in column I with correct monomer of column II and choose the correct option

Column I	Column II
<b>A.</b> Neoprene	<b>I.</b> Isoprene
<b>B.</b> Natural rubber	<b>II.</b> Tetrafluoro ethane
<b>C.</b> Teflon	<b>III.</b> Chloroprene
<b>D.</b> Acrilan	<b>IV.</b> Acrylnitrite

A.  $\begin{matrix} A & B & C & D \\ IV & III & II & I \end{matrix}$

B.  $\begin{matrix} A & B & C & D \\ I & II & III & IV \end{matrix}$

C.  $\begin{matrix} A & B & C & D \\ III & I & II & IV \end{matrix}$

D.  $\begin{matrix} A & B & C & D \\ II & IV & I & II \end{matrix}$

**Answer: C**



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