हमारा विश्वास... हर एक विद्यार्थी है ख़ास

JEE MAIN April'19

PAPER WITH SOLUTION
9 April 2019 _ Evening _ Chemistry

1. The major products A and B for the following reactions are, respectively :

(1)

(2)

(3)

(4)
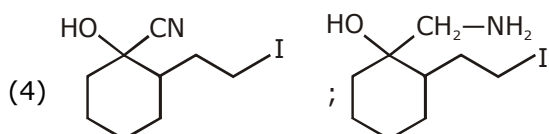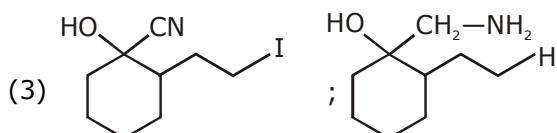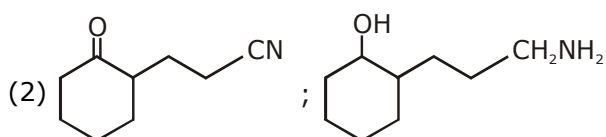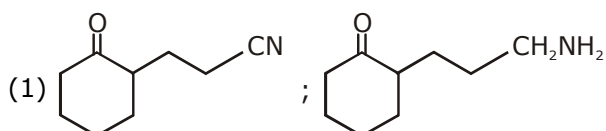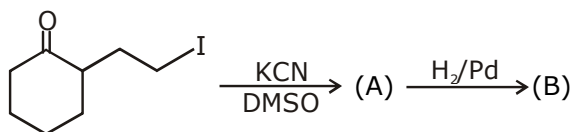
Sol. 2
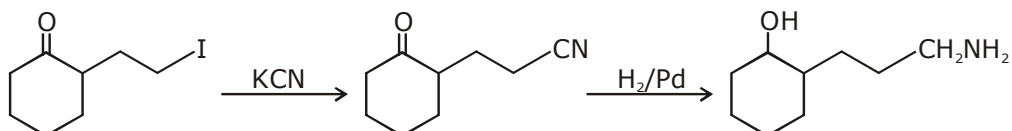
2. The maximum posible denticities of a ligand given below towards a common transition and inner-transition metal ion, respectively, are :
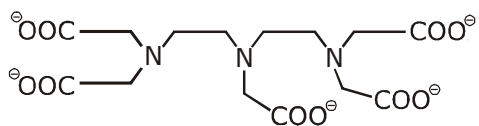
(1) 8 and 8   (2) 6 and 6   (3) 6 and 8   (4) 8 and 6

Sol. 3

3. HF has highest boiling point among hydrogen halides, because it has :
(1) lowest dissociation enthalpy   (2) strongest van der Waal's interactions
(3) lowest ionic character   (4) strongest hydrogen bonding

Sol. 4
HF has highest boiling point among
HX due to H-bonding

4. 10 mL of 1 mM surfactant solution forms a monolayer covering 0.24 cm² on a polar substrate. If the polar head is approximated as a cube, what is its edge length ?

(1) 0.1 nm   (2) 2.0 pm   (3) 2.0 nm   (4) 1.0 pm

Sol. **2**

$$M = \frac{n}{V}$$

$$n = M \times V = 10^{-3} \times \frac{10}{100} = 10^{-5}$$

∴ 1 mole occupies $0.24 \times 10^{-4} \times 10^5$ m²

1 molecule occupies $\frac{2.4}{6 \times 10^{23}} = 0.4 \times 10^{-23}$ m²

∴ edge length $= 2 \times 10^{-12}$ m
$$= 2.0 \text{ pm}$$

5. The major product of the following reaction is :

(1)   (2)   (3)   (4)
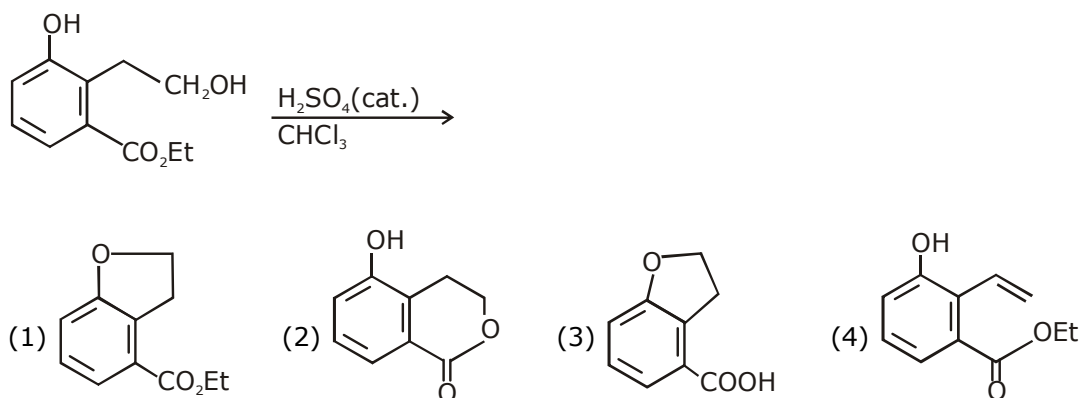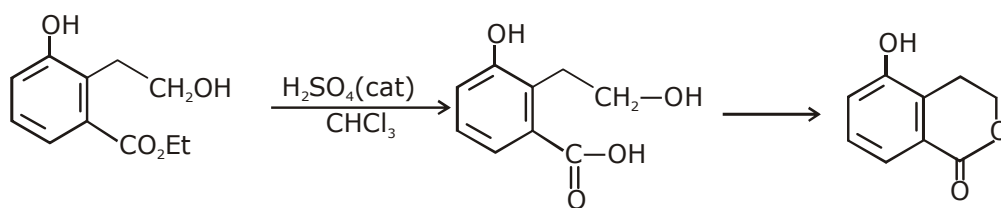
Sol. **2**

6. What would be the molality of 20% (mass/mass) aqueous solution of KI ?
(molar mass of KI = 166 g mol⁻¹)

(1) 1.48   (2) 1.51   (3) 1.08   (4) 1.35

Sol. **2**
20 gm of solute — 100 gm solution
20 gm of solute — 80 gm of solvent

$$\therefore m = \frac{20/166}{80} \times 1000 = 1.506$$

7. Noradrenaline is a / an :
(1) Antacid
(2) Antidepressant
(3) Neurotransmitter
(4) Antihistamine

Sol. **2**
Noradrenaline is a antidepressant

8. The amorphous form of silica is :
(1) Cristobalite
(2) tridymite
(3) kieselguhr
(4) quartz

Sol. **3**

9. Among the following species, the diamagnetic molecule is :
(1) CO
(2) O_2
(3) NO
(4) B_2

Sol. **1**
Follow MOT

10. The correct statements among I to III regarding group 13 element oxides are,
(I) Boron trixoide is acidic
(II) Oxides of aluminium and gallium are amphoteric
(III) Oxides of indium and thallium are basic
(1) (II) and (III) only
(2) (I) and (III) only
(3) (I) and (II) only
(4) (I), (II) and (III)

Sol. **4**
fact

11. **Assertion :**
For the extraction of iron, haematite ore is used
Reason :
Haematite is a carbonate ore of iron.
(1) Only the assertion is correct.
(2) both are assertion and reason are correct and the reason is the correct explanation for the assertion.
(3) Both the assertion and reason are correct, but the reason is not the correct explanation for teh assertion.
(4) Only the reason is correct.

Sol. **1**
fact
Fe_3O_4 haematite

12. In the following reaction

Carbonyl compound + MeOH $\xrightarrow{HCl}$ acetal, rate of the reaction is the highest for :
(1) Acetone as substrate and methanol in stoichiometric amount
(2) Acetone as substrate and methanol in excess
(3) Propanal as substrate and methanol in excess
(4) Propanal as substrate and methanol in stoichiometric amount

Sol. **3**

Carbonyl compound + $CH_3-OH \xrightarrow{HCl_3}$ Acetal
Propanal as substrate & methanol is in excess

13. A solution of $Ni(NO_3)_2$ is electrolysed between platinum electrodes using 0.1 Faraday electricity. How many mole of Ni will be deposited at the cathode ?
(1) 0.05   (2) 0.20   (3) 0.10   (4) 0.15

Sol. **1**

Equivalent of Ni^{2+} = No. of faradays
$\Rightarrow$ n × nf = 0.1

$\Rightarrow n = \dfrac{0.1}{2} = 0.05$

14. The one that is not a carbonate ore is :
(1) bauxite   (2) siderite   (3) calamine   (4) malachite

Sol. **1**

Bauxite is oxide ore, rest all are carbonate ore

15. Which one of the following about an electron occupying the 1s orbital in a hydrogen atom is incorrect ? (The Bohr radius is represented by a_0).
(1) The total energy of the electron is maximum when it is at a distance a_0 from the nucleus.
(2) The electron can be found at a distance $2a_0$ from the nucleus.
(3) The probability density of finding the electron is maximum at the nucleus.
(4) The magnitude of the potential energy is double that of its kinetic energy on an average.

Sol. **1**

Maximum e^- density that is energy is maximum at the nucleus

16. At a given temperature T, gases Ne, Ar, Xe and Kr are found to deviate from ideal gas behaviour.

Their equation of state is given as $p = \dfrac{RT}{V-b}$ at T.

Here, b is the van der Waals constant. Which gas will exhibit steepest increase in the plot of Z (compression factor) vs p ?
(1) Ar   (2) Kr   (3) Ne   (4) Xe

Sol. **4**

$p(V - b) = RT$ For a real gas
$\Rightarrow PV - Pb = RT$
$\Rightarrow PV = Pb + RT$

$\Rightarrow \dfrac{PV}{RT} = \dfrac{Pb}{RT} + \dfrac{RT}{RT}$

$\Rightarrow Z = 1 + \dfrac{Pb}{RT}$

Slope $= \dfrac{b}{RT}$

$\therefore$ Xe
larger is the size larger is the value of b.

17. Hinsberg's reagent is :
(1) $SOCl_2$ (2) C_6H_5COCl (3) $(COCl)_2$ (4) $C_6H_5SO_2Cl$

Sol. 4

$C_6H_5SO_2Cl$ is a hinsberg's reagent

18. The structures of beryllium chloride in the solid state and vapour phase, respectively, are :
(1) dimeric and chain
(2) dimeric and dimeric
(3) chain and dimeric
(4) chain and chain

Sol. **3**

$(BeCl_2)_n$ $(BeCl_2)_2$
Solid   gas

19. Increasing order of reactivity of the following compounds for S_N1 substitution is :

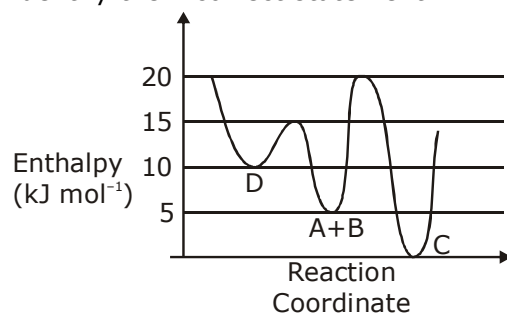(A) $(CH_3)_2CH-CH_2-Cl$ (B) H_3C-CH_2-Cl (C) $H_3CO-C_6H_4-CH_2-Cl$ (D) $C_6H_5-CH_2-Cl$
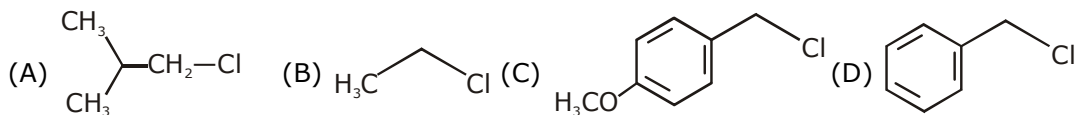
(1) (B) < (C) < (D) < (A)
(2) (B) < (C) < (A) < (D)
(3) (A) < (B) < (D) < (C)
(4) (B) < (A) < (D) < (C)

Sol. **4**

Rate of $SN_1 \propto$ stability of carbocation
B < A < D < C

20. Consider the given plot of enthalpy of the following reaction between A and B.
A + B → C + D
Identify the incorrect statement.

(1) D is kinetically stable product
(2) Activation enthalpy to form C is 5 kJ mol^{-1} less than that to form D.
(3) C is the thermodynamically stable product.
(4) Formation of A and B from C has highest enthalpy of activation.

Sol. **2**

From graph

21. During compression of a spring the work done is 10 kJ and 2 kJ escaped to the surroundings as heat. The change in internal energy, ΔU (in kJ) is :
(1) −8   (2) 12   (3) −12   (4) 8

Sol. **4**

$\Delta E = q + w$
$= -2 + 10 = 8$ kJ

22. The maximum number of possible oxidation states of actinoides are shown by :
(1) neptunium (Np) and plutonium (Pu)
(2) nobelium (No) and lawrencium (Lr)
(3) actinium (Ac) and thorium (Th)
(4) berkelium (Bk) and californium (Cf)

Sol. **1**

Np ⇒ (upto 7)

23. The layer of atmosphere between 10 km to 50 km above the sea level is called as :
(1) stratosphere   (2) mesosphere   (3) thermosphere   (4) troposphere

Sol. **1**
10 to 50 km is called as stratosphere

24. In an acid-base titration, 0.1 M HCl solution was added to the NaOH solution of unknown strength. Which of the following correctly shows the change of pH of the titration mixture in this experiment ?
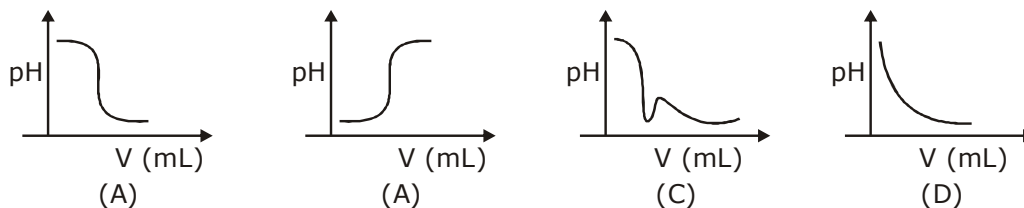

(1) (B)   (2) (C)   (3) (D)   (4) (A)

Sol. **4**
Initially strong base is given in which strong acid is added causing sharp decrease in pH
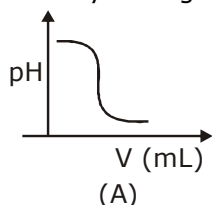
25. Molal depression constant for a solvent is 4.0 K kg mol^{-1}. The depression in the freezing point of the solvent for 0.03 mol kg^{-1} solution of K_2SO_4 is :
(Assume complete dissociation of the electrolyte)
(1) 0.18 K   (2) 0.24 K   (3) 0.36 K   (4) 0.12 K

Sol. **3**
$\Delta T_f = ik_f m = 3 \times 4 \times 0.03 = 0.36$ K

26. Which of the following potential energy (PE) diagrams represents the S_N1 reaction ?
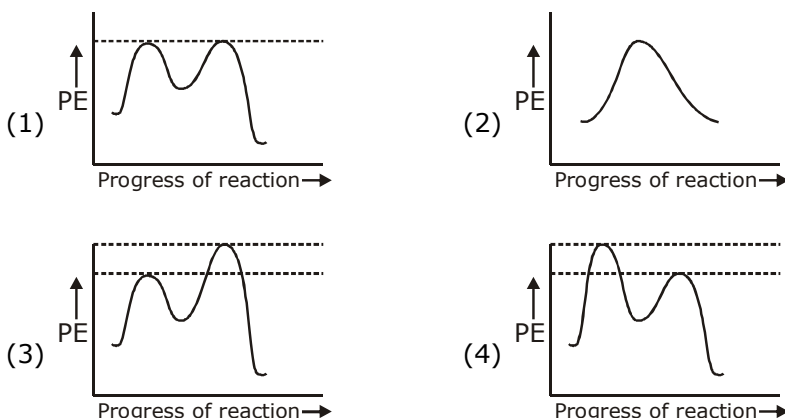
Sol. **4**
In SN_1 reaction, first step is the RDS. Hence

27. Which of the following compounds is a constituent of the polymer ?

$$\left[HN-\overset{\overset{\displaystyle O}{\|}}{C}-NH-CH_2 \right]_n \ ?$$
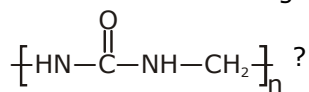
(1) Formaldehyde   (2) N–Methyl urea   (3) Ammonia   (4) Methylamine

Sol. **2**

$$\left[HN-\overset{\overset{\displaystyle O}{\|}}{C}-NH-CH_2 \right]_n$$
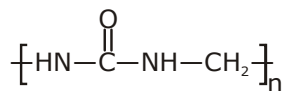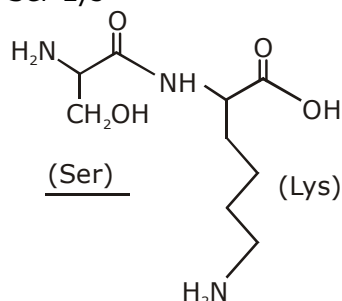
N-methyl urea

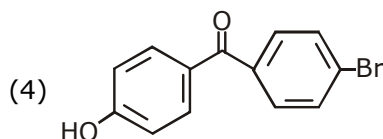**28.** The peptide that gives positive cerric ammonium nitrate and carbylamine tests is :
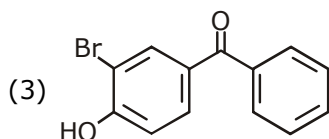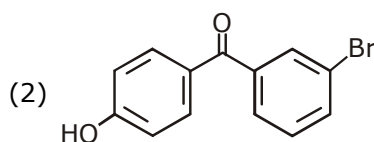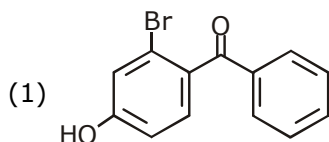
(1) Lys-Asp   (2) Gln-Asp   (3) Ser-Lys   (4) Asp-Gln

Sol. **3**
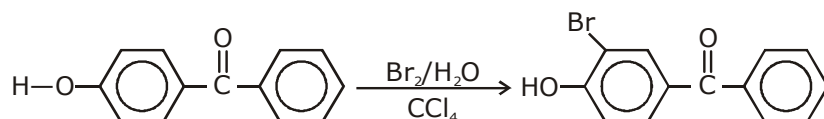
Ser-Lys

29. p–Hydroxybenzophenone upon reaction with bromine in cabon tetrachloride gives :

Sol. **3**

P-hydroxy benzophenone

30. The correct statements amont I to III are :

(I) Valence bond theory cannot explain the colour exhibited by transition metal complexes.

(II) Valence bond theory can predict quantitatively the magnetic properties of transition metal complexes.

(III) Valence bond theory cannot distinguish ligands as weak and strong field ones.

(1) (I) and (II) only   (2) (I), (II) and (III)

(3) (II) and (III) only   (4) (I) and (III) only

Sol. **4**

मोशन ने बनाया **साधारण** को **असाधारण**

JEE Main Result Jan'19

4 RESIDENTIAL COACHING PROGRAM (DRONA)
STUDENTS ABOVE 99.9 PERCENTILE

99.9 percentile
PHYSICS 100 percentile
Nitin Gupta
Exp. Score **335** | Last yr Score **149**

99.9 percentile
Shiv Modi
Exp. Score **318** | Last yr Score **153**

99.9 percentile
Ritik Bansal
Exp. Score **308** | Last yr Score **218**

99.9 percentile
Shubham Kumar
Exp. Score **300** | Last yr Score **153**

Total Students Above 99.9 percentile - **17**

Total Students Above 99 percentile - **282**

Total Students Above 95 percentile - **983**

% of Students Above 95 percentile $\frac{983}{3538} =$ **27.78%**

Scholarship on the Basis of 12th Class Result

Marks PCM or PCB	Hindi State Board	State Eng OR CBSE
70%-74%	30%	20%
75%-79%	35%	25%
80%-84%	40%	35%
85%-87%	50%	40%
88%-90%	60%	55%
91%-92%	70%	65%
93%-94%	80%	75%
95% & Above	90%	85%

New Batches for Class 11th to 12th pass
17 April 2019 & 01 May 2019

हिन्दी माध्यम के लिए पृथक बैच

Scholarship on the Basis of JEE Main Percentile

Score	JEE Mains Percentile	English Medium Scholarship	Hindi Medium Scholarship
225 Above	Above 99	Drona Free (Limited Seats)	
190 to 224	Above 97.5 To 99	100%	100%
180 to 190	Aboev 97 To 97.5	90%	90%
170 to 179	Above 96.5 To 97	80%	80%
160 to 169	Above 96 To 96.5	60%	60%
140 to 159	Above 95.5 To 96	55%	55%
74 to 139	Above 95 To 95.5	50%	50%
66 to 73	Above 93 To 95	40%	40%
50 to 65	Above 90 To 93	30%	35%
35 to 49	Above 85 To 90	25%	30%
20 to 34	Above 80 To 85	20%	25%
15 to 19	75 To 80	10%	15%

सैन्य कर्मियों के बच्चो के लिए **50%** छात्रवृति   प्री-मेडिकल में छात्राओं को **50%** छात्रवृति

Fee ₹ 1500   FOR TARGET MAY 2019 ADVANCED ASPIRANTS
Score Above 99 percentile in Jan 2019 attempt free of cost