1. During the change of O_2 to O_2, the incoming electron goes to the orbital :

(1) $\pi^* 2p_x$ (2) $\pi 2p_y$ (3) $\pi 2p_x$ (4) $\sigma^* 2p_z$

Sol. **1**

According to MOT energy order of MO of O_2 is -

$\sigma 1s < \sigma^* 2s < \sigma 2s < \sigma^* 2s < \sigma 2P_z < \pi 2P_x < \pi^* 2px = \pi^* 2py < \sigma^* 2p_z$

2. The isoelectronic set of ions is :

(1) F^-, Li^+, Na^+ and mg^{2+} (2) Li^+, Na^+, O^{2-} and F^-

(3) N^{3-}, Li^+, Mg^{2+} and O^{2-} (4) N^{3-} O^2 , F^- and Na^+

Sol. **4**

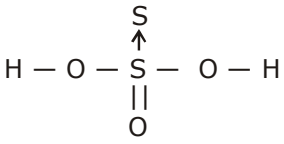
All species have 10 electrons

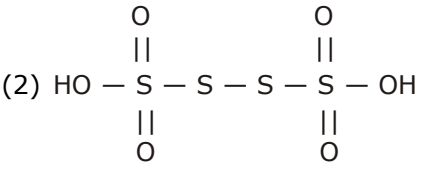
3. The oxoacid of sulphur that does not contain bond between sulphur atoms is :

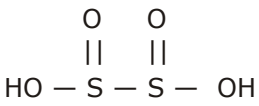
(1) $H_2S_2O_3$ (2) $H_2S_4O_6$ (3) $H_2S_2O_4$ (4) $H_2S_2O_7$

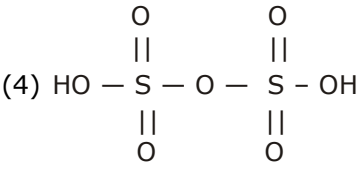
Sol. **4**

Factual

(1)


(2)


(3)


(4)


4. Match the refining methods (Column I) With metals (Column II).

Column I (Refining methods)		**Column II (Metals)**
(I) Liquation	(a)	Zr
(II) Zone Refining	(b)	Ni
(III) Mond process	(c)	Sn
(IV) Van Arkel Method	(d)	Ga

(1) (I) – (b); (II) – (d); (III) – (a); (IV) – (c)

(2) (I) – (c); (II) – (d); (III) – (b); (IV) – (a)

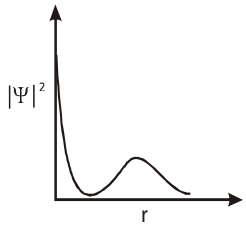
(3) (I) – (b); (II) – (c); (III) – (d); (IV) – (a)

(4) (I) – (c); (II) – (a); (III) – (b); (IV) – (d)

Sol. **2**

Fact

5. The Graph between $|\Psi|^2$ and r(radial distance) is Shown below. This represents :

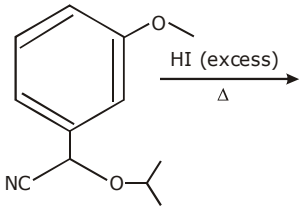


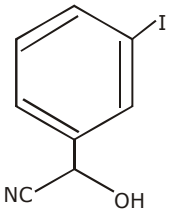
(1) 2p orbital (2) 2s orbital (3) 3s orbital (4) 1s orbital

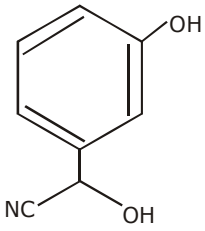
Sol. **2**

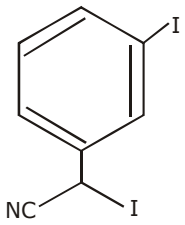
No. of Radid Node = 2 – 0 — 1 = 1

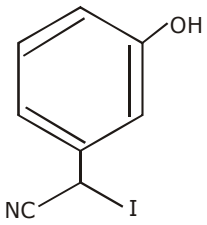
6. The major product of the following reaction is :



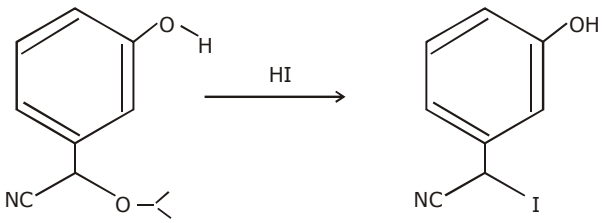
(1) 

(2) 

(3) 

(4) 

Sol. **4**



7. The principle of column chromatography is :

(1) Capillary action.

(2) Differential absorption of the
Substances on the solid phase.

(3) Gravitational force.

(4) Differential adsorption of the substances on the solid phase.

Sol. **4**

Differential adsorption of the substance on the solid phase

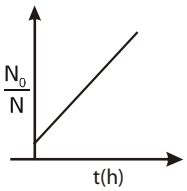
8. The regions of the atmosphere, where clouds form and where we live, respectively, are :
(1) Stratosphere and Troposphere (2) Stratosphere and Stratosphere
(3) Troposphere and Stratosphere (4) Troposphere and Troposphere

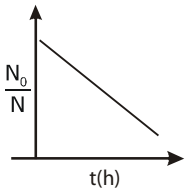
Sol. **4**

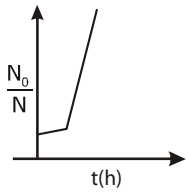
9. The synonym for water gas when used in the production of methanol is :
(1) laughing gas (2) natural gas (3) fuel gas (4) syn gas

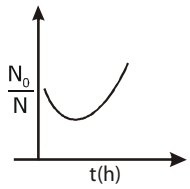
Sol. **4**
Fact

10. A bacterial infection in an internal wound grow as $N'(t) = N_0 \exp(t)$, where the time t is in hours. A dose of antibiotic, taken orally, needs 1 hour to reach the wound. Once it reaches there, the bacterial population goes down as $\frac{dN}{dt} = -5N^2$. What will be the plot of $\frac{N_0}{N}$ vs. t after 1 hour

(1) 

(2) 

(3) 

(4) 

Sol. **1**

$N = N_0 e^{-\lambda t}$

$\frac{N_0}{N} = e^{\lambda t}$

11. The alloy used in the construction of aircrafts is :
(1) Mg – Zn (2) Mg – Al (3) Mg – Mn (4) Mg – Sn

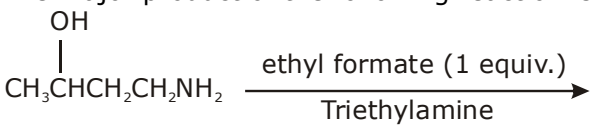
Sol. **2**
because it is more resist to corrosin and light weighted

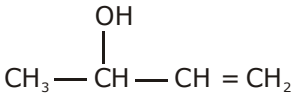
12. Three complexes,
$[CoCl(NH_3)_5]^{+2}$ (I),
$[Co(nh_3)_5\ H_2O]^{+3}$ (II) and
$[Co(NH_3)_6]^{3+}$ (III)
absorb light in the visible region. The correct order of the wavelength of light absorbed by them is :
(1) (I) > (II) > (III) (2) (II) > (I) > (III)
(3) (III) > (II) > (I) (4) (III) > (I) > (II)

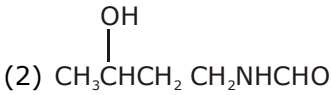
Sol. **1**

NH_3 H_3O Cl $\longrightarrow$
strength of ligands ↓
splitting of d - orbitals ↓
energy diff. b/c t_2g and eg orbitals ↓
wavelength of absorbed light ↑

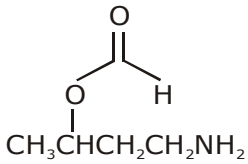
13. The major product of the following reaction is:



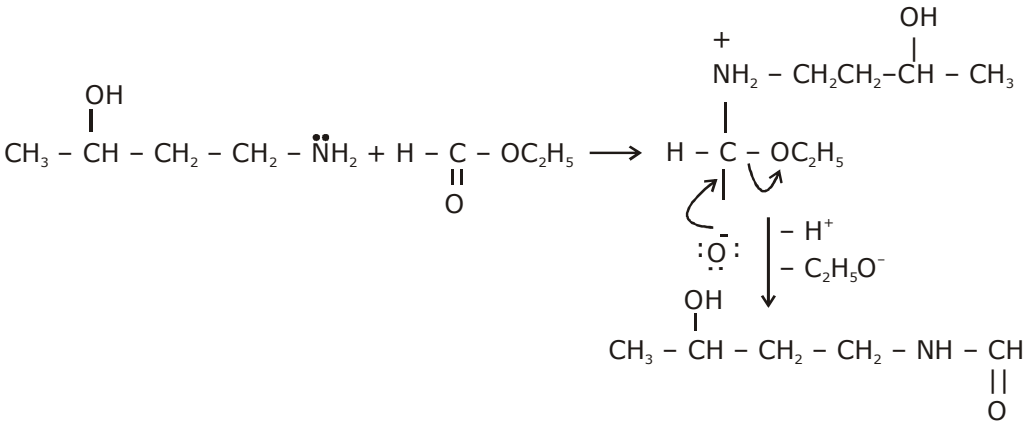
(1) 

(2) 

(3) $CH_3CH=CH-CH_2NH_2$

(4) 

Sol. **2**



14. Amylopectin is composed of :
(1) α-D-glucose, $C_1 - C_4$ and $C_1 - C_6$ Linkages
(2) β-D-glucose, C_1–C_4 adn C_1–C_6 linkages
(3) α-D-glucose, C_1–C_4 and C_2 –C_6 linkages
(4) β-D- glucose, C_1–C_4 and C_2–C_6 linkages

Sol. **1**
α-D-Glucose, $C_1 - C_4$ and $C_1 - C_6$ linkage

15. Condsider the statements S1 and S2 :
S1 : Conductivity always increases with decrease in the concentration of electrolyte.
S2 : Molar conductivity always increases with decrease in the concentratio of electrolyte.
The correct option among the following is :
(1) Both S1 and S2 are correct
(2) S1 is correct and S2 is wrong
(3) Both S1 and S2 are wrong
(4) S1 is wrong and S2 is correct

Sol. **4**

16. Consider the hydrated ions of Ti^{2+}, V^{2+}, Ti^{3+} and Sc^{3+}. The correct order of their spin-only magnetic moments is :

(1) $Sc^{3+} < Ti^{3+} < V^{2+} < Ti^{2+}$ (2) $Ti^{3+} < Ti^{2+} < Sc^{3+} < V^{2+}$

(3) $V^{2+} < Ti^{2+} < Ti^{3+} < Sc^{3+}$ (4) $Sc^{3+} < Ti^{3+} < Ti^{2+} < V^{2+}$

Sol. **1**

$Sc^{3+}(3d^0\ 4s^0)$, $\mu = 0$

$T_i^{2+}(3d^2\ 4s^0)$, $\mu = \sqrt{8}$

$T_i^{3+}(3d^1 4s^0)$ $\mu = \sqrt{3}$

$v^{2+}(3d^3\ 4s^0)$, $\mu = \sqrt{15}$

17. Consider the following statements

(a) The pH of a mixture containing 400 mL of 0.1 M H_2SO_4 and 400 mL of 0.1 M NaOH will be approximately 1.3.

(b) Ionic product of water is temperature dependent.

(c) A monobasic acid with $K_a = 10^{-5}$ has a pH = 5. The degree of dissociation of this acid is 50%.

(d) The Le Chatelier's principle is not applicable to common-ion effect.

The correct statements are :

(1) (a), (b) and (c) (2) (a), (b) and (d)

(3) (b) and (c) (4) (a) and (b)

Sol. **1**

(a) $\frac{40}{800} = \frac{1}{20}$ $P^H = \log(1/20)$

$P^H = 1.3$ (b) Theoritical

(c) $10^{-5} = 0.5 \times \frac{10^{-5}}{0.5}$

18. The correct order of catenation is :

(1) C > Si > Ge ≈ Sn (2) Ge > Sn > Si > C

(3) Si > Sn > C > Ge (4) C > Sn > Si ≈ Ge

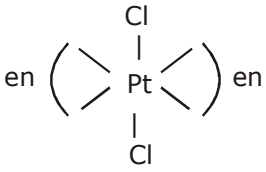
Sol. **1**

$\text{Catenation} \propto \frac{1}{\text{BDE}}$

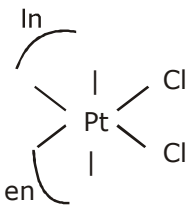
19. Ethylamine ($C_2H_5NH_2$) can be obtained from N-ethylphthelimide on treatment with :

(1) $NaBH_4$ (2) NH_2NH_2 (3) CaH_2 (4) H_2O

Sol. **2**



Trans-Isomer



Cis - Isomer

20. Consider the following table :

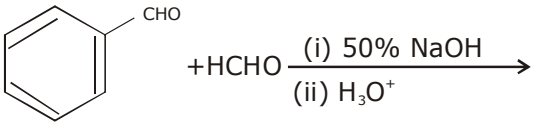
Gas	a/(k ta dm^6 mol^{-1})	b/(dm^3 mol^{-1})
A	642.32	0.05196
B	155.21	0.04136
C	431.91	0.05196
D	155.21	0.4382

a and b are van der Walls constants. The correct statement about the gases is :
(1) Gas C will occupy more volume than Gas A; gas B will be lesser compresible than gas D
(2) Gas C will occupy lesser volume than Gas A; gas B will be more compressible than gas D.
(3) Gas C will occupy lesser volume than Gas A; gas B will be lesser compressible than gas D
(4) Gas C will occupy more volume than Gas A; gas B will be more compressible than gas D

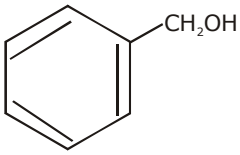
Sol. **4**

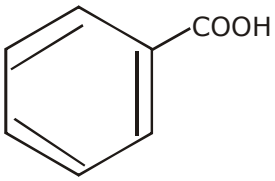
$$z = 1 + \left(b - \frac{a}{R_T}\right)\frac{1}{v_n}$$

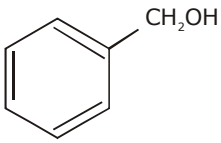
21. Major products of the following reaction are :

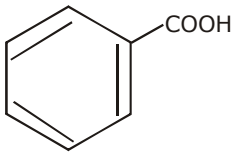


(1) CH_3OH and HCO_2H

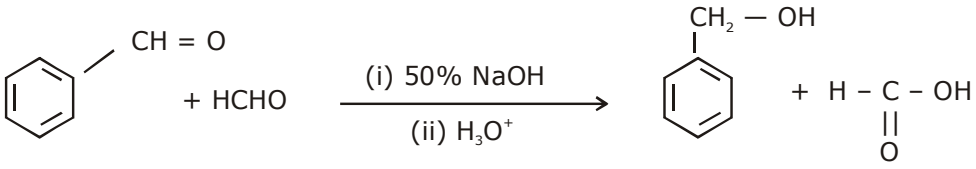
(2) HCOOH and 

(3) CH_3OH and 

(4) 

and 

Sol. **2**



22. A process will be spontaneous at all temperatures if :
(1) $\Delta H > 0$ and $\Delta S > 0$
(2) $\Delta H > 0$ and $\Delta S < 0$
(3) $\Delta H < 0$ and $\Delta S < 0$
(4) $\Delta H < 0$ and $\Delta S > 0$

Sol. **4**

$$\Delta G = [\Delta H - T\Delta S] < 0$$

$\Delta H < 0$

$\Delta S > 0$

23. Which of the following is a condensation polymer ?

(1) nylon 6,6 (2) Teflon (3) Neoprene (4) Buna - S

Sol. **1**

$H_2N - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - NH_2 + HOOC - CH_2 - CH_2 - CH_2 - CH_2 - COOH$

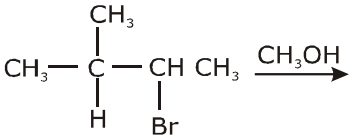
hexamethylene diamine

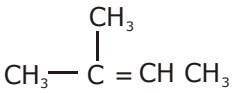
$\downarrow -H_2O$

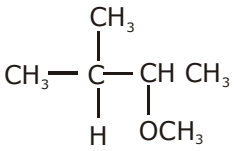
$-NH-(CH_2)_6-NH-\overset{O}{\overset{\|}{C}}-(CH_2)_4-\overset{O}{\overset{\|}{C}}-$

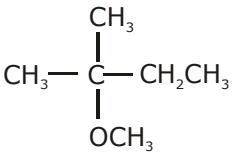
(Nylone - 66)

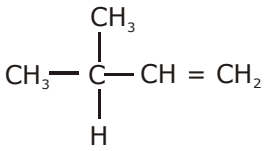
24. The major product of the following reaction is :



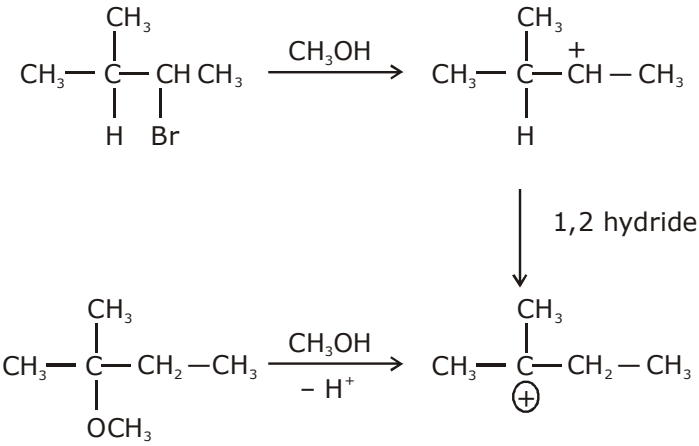
(1) 

(2) 

(3) 

(4) 

Sol. **3**



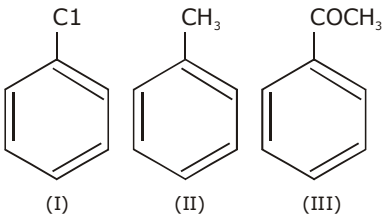
25. The species that can have a trans-isomer is :

(en = ethane-1,2-diamine, ox = oxalate)

(1) $[Zn(en)Cl_2]$ (2) $[Pt(en)_2Cl_2]^{2+}$ (3) $[Pt(en)Cl_2]$ (4) $[Cr(en)_2(ox)]^+$

Sol. **2**

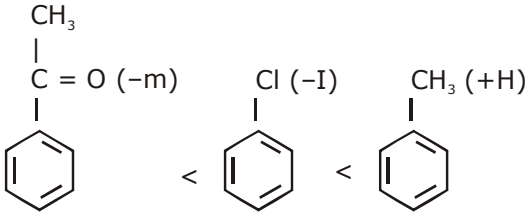
26. The increasing order of the reactivity of the following compounds towards electrophilic aromatic substitution reactions is :



(1) III < I < II (2) III < II < I (3) II < I < III (4) I < III < II

Sol. **1**

Rate of Electrophilic substribtion reaction $\propto$ e^- density of benzene ring



27. At 300 K and 1 atmospheric pressure, 10 mL of a hydrocarbon required 55 mL of O_2 for complete combustion, and 40 mL of CO_2 is formed. The formula of the hydrocarbon is :

(1) C_4H_7C1 (2) C_4H_6 (3) C_4H_{10} (4) C_4H_8

Sol. **2**

$$C_nH_{2n-2} + \frac{(3n-1)}{\alpha}O_2 \longrightarrow nCO_2 + (n-1)\,H_2O$$

n = 4

$$C_4H_6 + \frac{11}{2}\,O_2 \rightarrow 4CO_2 + 3\,H_2O$$

$$C_4H_Y + (4 + \frac{y}{6}) + O_2 \rightarrow 4CO_2 + \frac{y}{2}H_2O$$

$$4 + \frac{y}{4} = 5.5$$

y = 6

28. At room temperature, a dilute solution of urea is prepared by dissoving 0.60g of urea in 360 g of water. If the vapour pressure of pure water at this temperature is 35 mm Hg, lowering of vapour pressure will be :

(molar mass of urea = 60g mol^{-1})

(1) 0.028 mmHg (2) 0.031mmHg (3) 0.027 mmHg (4) 0.017 mmHg

Sol. **4**

$$\frac{0.6}{60} = 10^{-2}\,\text{mol} \qquad \frac{\Delta P}{35} = \frac{10^{-2}}{20} \qquad \Delta P = \frac{35}{20} \times 10^{-2} = 17.5 \times 10^{-3}$$

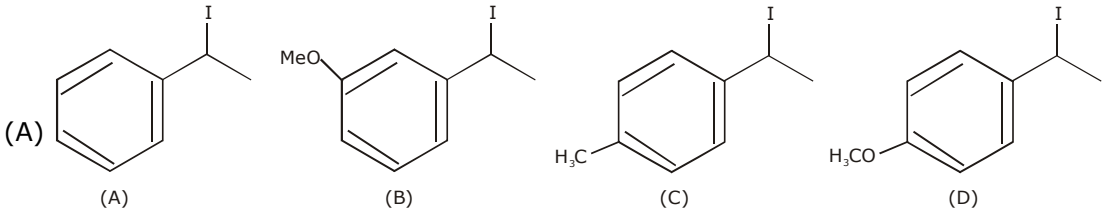
29. A gas undergoes physical adsorption on a surface and follows the given freundlich adsorption isotherm equation

$$\frac{x}{m} = kp^{0.5}$$

Adsorption of the gas increases with :

(1) Increase in p and decrease in T
(2) Increase in p and increase in T
(3) Decrease in p and decrease in T
(4) Decrease in p and increase in T

30. Increasing rate of S_N 1 reaction in the following compounds is :



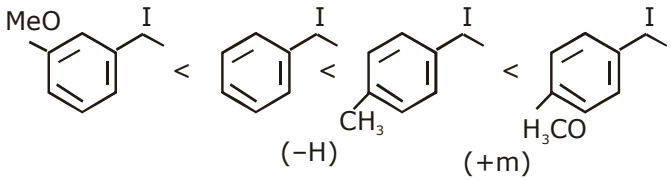
(A) (B) (C) (D)

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

Sol. **1**

Rate of SN_1 reaction α stabilitty of carbocation

(B) < (A) < (C) < (D)



मोशन ने बनाया साधारण को असाधारण

JEE Main Result Jan'19

4 RESIDENTIAL COACHING PROGRAM (DRONA) STUDENTS ABOVE 99.9 PERCENTILE

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% छात्रवृत्ति

प्री-मेडिकल में छात्राओं को 50% छात्रवृत्ति