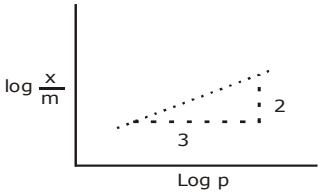
1. Assertion: Ozone is destroyed by CFCs in the upper stratosphere.
Reason: Ozone holes increase the amount of UV radiation the earth.
(1) Assertion and reason are incorrect.
(2) Assertion and reason are both correct, and the reason is the correct explanation for the assertion.
(3) Assertion and reason are correct but, the reason is not the explanation for the assertion.
(4) Assertion is false, but the reason is correct.

Sol. (3)
Fact

2. Adsorption of a gas follows freundlich adosorbed isotherm. x is the mass of the gas adsorbed on mass m of the adsorbent. The plot log $\frac{x}{m}$ versus log p is shown in the given graph. $\frac{x}{m}$ is proportional to :



(1) P^3 (2) $P^{2/3}$ (3) $P^{3/2}$ (4) P^2

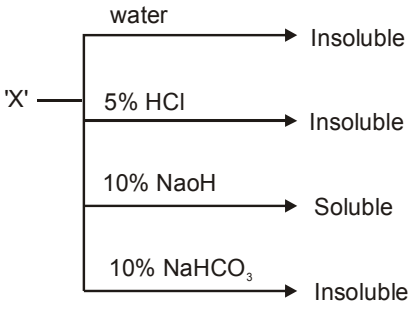
Sol. (2)

$$\log\left(\frac{x}{m}\right) = \frac{2}{3}\log(P) + \text{const.}$$

$$\frac{x}{m} \propto P\frac{2}{3}$$

$$= P\frac{2}{3}$$

3. An organic compound 'X' showing the following solubility profile is :



(1) Benzamide (2) Oleic acid (3) o-Toluidine (4) m-Cresol

Sol. (4)
Both m-(re so) and olek and form salt with 10% NaOH, but m=(re so) salt is soluble whereas oeic acid salt is insoluble due to very long unsaturated carbon chain.

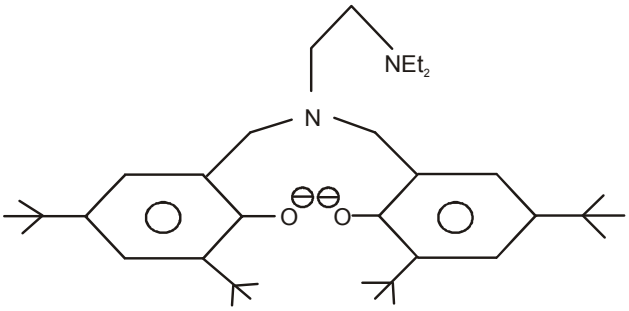
4. The correct order of hydration enthapies of alkali metal ions is :
(1) $Li^+ > Na^+ > Cs^+ > Rb^+$ (2) $Na^+ > Li^+ > K^+ > Rb^+ > Cs^+$
(3) $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$ (4) $Na^+ > Li^+ > K^+ > Cs^+ > Rb^+$

Sol. (3)

$$H.E \propto \frac{Charge}{Size}$$

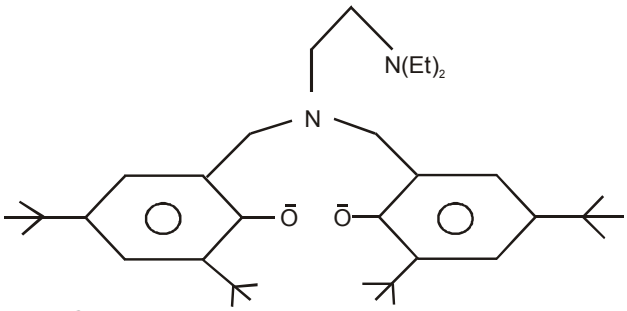
$Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$
$L \rightarrow R$ charge = const. size $\uparrow$ $\therefore$ HE$\downarrow$

5. The following ligand is :



(1) hexadentate (2) tridentate
(3) bidentate (4) tetradentate

Sol. (4)



Two $_{-}O^{-}$
Two N

6. Maltose on treatment with dilute HCI
(1) D-Glucose and D-Fructose (2) D-Glucose
(3) D-Fructose (4) D-Galactose

Sol. (1)

$$Maltose \xrightarrow{dil.HCl} D-Glucose$$

7. With respect to an ore, Ellingham diagram helps to predict the feasibility of its.
(1) Thermal reducation (2) Electrolysis
(3) Vapour phase refining (4) Zone refining

Sol. (1)
Ellingham diagram in a graph between $\Delta G°_f$ of oxide/mole O_2 vs temp. which help to predict suitable reducing agent for therma reduction of oxide.

8. Given that $E^{\Theta}_{O_2/H_2O} = 1.23\,V$;

$E^{\Theta}_{S_2O_8^{2-}/SO_4^{2-}} = 2.05V$

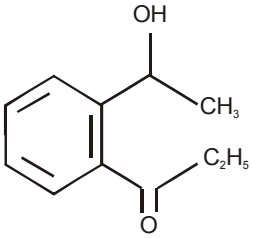
$E^{\Theta}_{Br_2/Br^-} = 1.09V$

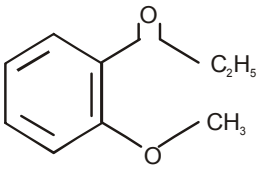
$E^{\Theta}_{Au^{3+}/Au} = 1.4V$

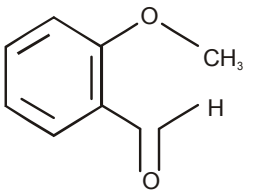
The strongest oxidizing agent is :
(1) O_2 (2) Au^{3+}
(3) Br_2 (4) $S_2O_8^{2-}$

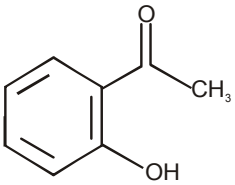
Sol. (4)
Species having highest value of SRP, will be strongest oxidising agent.

9. An organic compound neither reacts with natural ferric chloride solution nor with fehling solution. it however, reacts with Grignard reagent and gives positive iodoform test. The compound is :

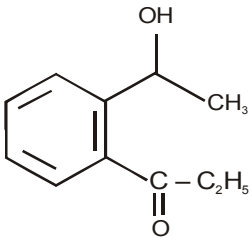
(1) 

(2) 

(3) 

(4) 

Sol. (1)



Neutral $FeCl_3$ → No reaction (phenol is absent)

Fehling's Sol. → No reaction (–CHO is absent)

Grignard reg. → Nucleophilic addition & Acid base reaction with –OH

Iodo form Reac. → (Positive (presence of $-\overset{\overset{O}{\|}}{C}-CH_3$)

10. Diborane (B_2H_6) reacts indepndently with O_2 and H_2O to produce, resopectively :
(1) HBO_2 and H_3BO_3 (2) B_2O_3 and $[BH_4]^-$
(3) B_2O_3 and H_3BO_3 (4) H_3BO_3 and B_2O_3

Sol. (3)

$B_2H_6 + O_2 \longrightarrow B_2O_3 + H_2O$

$B_2H_6 + H_2O \longrightarrow H_3BO_3 + H_2$

11. For silver, $C_p(J\,K^{-1}\,mol^{-1})=23+0.01T$. If the temperature (T) of 3 moles of silver is raised from 300 K to 1000 K at 1 atm pressure, the value of ΔH will be close to :
(1) 16 KJ (2) 21 KJ
(3) 62 KJ (4) 13 KJ

Sol. (3)

$$\Delta H = \int nc_p dt$$

$$\Delta H = 3\times\int\left(23+\frac{T}{100}\right)dt$$

$$\Delta H = 3\left[23\times(1000-300)+\frac{1}{2}(1000-300)(1000+300)\right]$$

$= 3[23 \times 700 + 7 \times 650]$

$\Delta H = 3 \times [230 + 65] \times 70$

$\Delta H = 62$ KJ

12. The vapour pressures of pure liquids A and B are 400 and 600 mmHg, respectively at 298 K On mixing the two liquids, the sum of their initial volume is equal ot the volume of the final mixture. The mole fraction of liquid B is 0.5 in the mixture, The vapour pressure of the final solution, the mole fractions of components A and B in vapour phase, respectively are :
(1) 500 mmHg. 0.5,0.5
(2) 450 mmHg.0.5,0.5
(3) 450 mmHg, 0.4,0.6
(4) 500 mmHg, 0.4, 0.6

Sol. (4)

$$P_{Total} = x_A P_A^O + x_B P_B^O = \frac{400+600}{2} = 500$$

$$y_A \times P_{Total} = x_A \times P_A^O$$

$$y_A \times 500 = \frac{1}{2} \times 400$$

$$y_A = \frac{2}{5}$$

$$y_B = \frac{3}{5}$$

13. Which is wrong with respect to our responsiblity as a human being to protect our environment ?
(1) Restricting the use of vehicles
(2) Setting up compost tin in gardens.
(3) Using plastic bags.
(4) Avoiding the use of floodlighted facilities

Sol. (3)
Plastic in a non-biodegradable pollutant thus its use is harmfull to the environment.

14. If solublity product of $Zr_3(PO_4)_4$ is denoted by K_{sp} and its molar solubility is denoted by S, then which of the following relation between S and K_{sp} is correct ?

(1) $S = \left(\frac{K_{sp}}{6912}\right)^{1/7}$ (2) $S = \left(\frac{K_{sp}}{929}\right)^{1/9}$ (3) $S = \left(\frac{K_{sp}}{216}\right)^{1/7}$ (4) $S = \left(\frac{K_{sp}}{144}\right)^{1/6}$

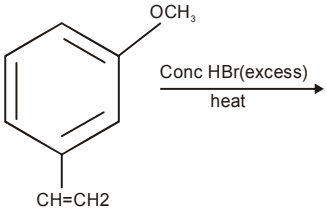
Sol. (1)

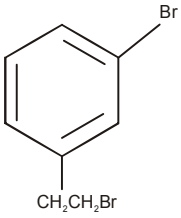
$$Zr_3(P_4^0)_4 \rightleftharpoons \underset{3s}{3Zr^{+4}} + \underset{4s}{P_4^{0^{3-}}}$$

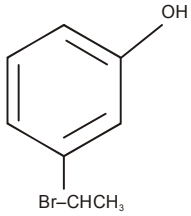
$$K_{SP} = (3s)^3(4s)^4$$

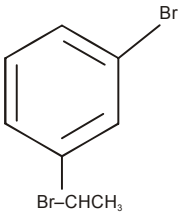
$$S = \left[\frac{K_{SP}}{6912}\right]^{\frac{1}{7}}$$

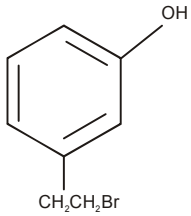
15. The major product of the following reaction is :



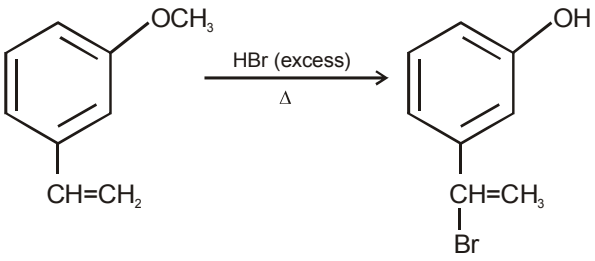
(1) 

(2) 

(3) 

(4) 

Sol. (2)

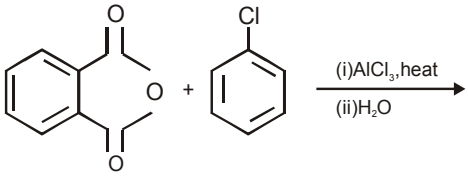


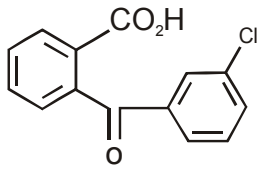
16. The size of the iso-electronic species Cl^- Ar and Ca^{2+} is affected by :
(1) Principal quantum number of valence shell
(2) electron-electron interaction in the outer orbitals
(3) nulcear charge
(4) azimuthal quantum number of valence shell

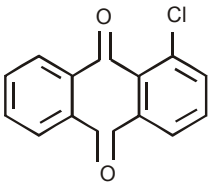
Sol. (3)
Fact

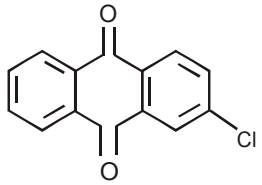
$$\text{Size} \propto \frac{1}{\text{Nuclear Charge}}$$

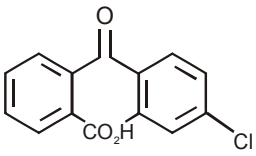
17. The major product of the following reaction is :



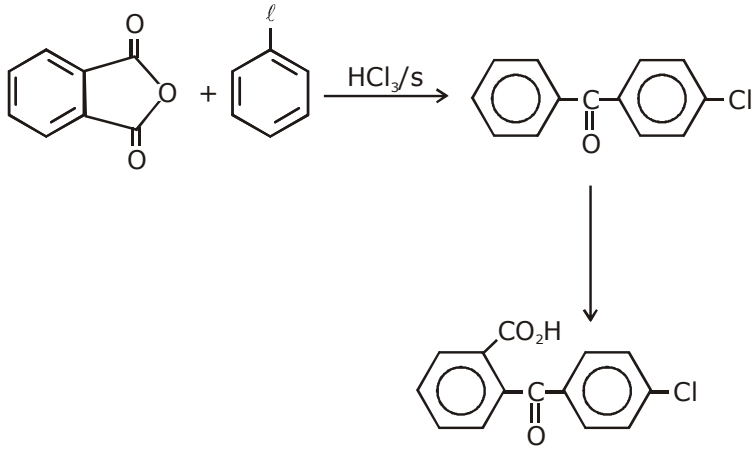
(1) 

(2) 

(3) 

(4) 

Sol. (4)



18. In order to oxidise a mixture of one mole of each of FeC_2O_4, $Fe_2(C_2O_4)_3$, $FeSO_4$ and $Fe_2(SO_4)_3$ in acidic medium, the number of moles of $KMnO_4$ required is :

(1) 1.5 (2) 2 (3) 3 (4) 1

Sol. (2)

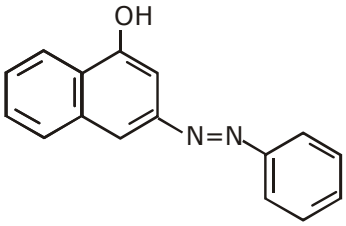
$$\underset{1\,mol}{FeC_2O_4} + \underset{1\,mol}{Fe_2(C_2O_4)_2} + \underset{1\,mol}{FeSO_4} + \underset{1\,mol}{Fe_2(SO_4)_3} \xrightarrow{KMnO_4} Fe^{+3} + CO_2 + Mn + 2$$

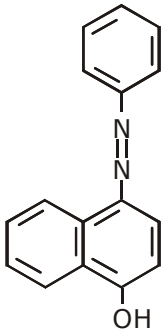
Equivalents of $KMnO_4$ = Total Equivalents of reactants

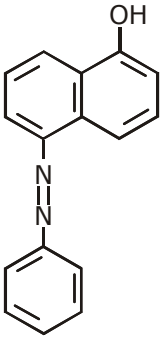
$5 \times$ moles of $KMnO_4 = 1 \times 3 + 1 \times 6 + 1 \times 1$

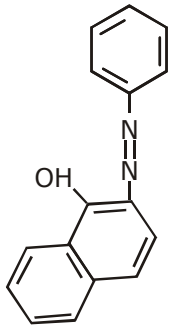
$5 \times$ moles of $KMnO_4 = 10$ mol

19. Coupling of benzene diazonium chloride with 1 - naphthol in alkaline medium will give :

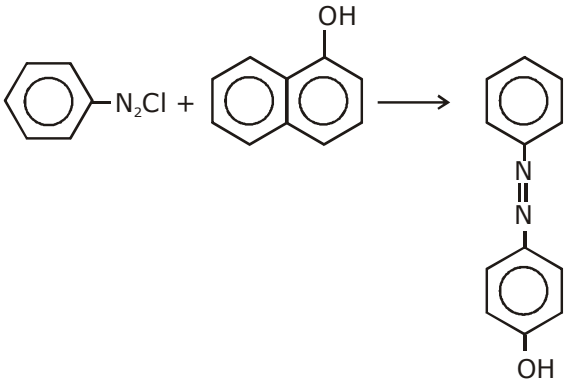
(1) 

(2) 

(3) 

(4) 

Sol. (2)



20. For the reaction 2A + B $\rightarrow$ C, the values of initial rate at diffrent reactant concentrations are given in the table below. The rate law for the reaction is :

[A](mol L–1)	[B](mol L–1)	Initial Rate (mol $L^{-1}S^{-1}$)
0.05	0.05	0.045
0.10	0.05	0.090
0.20	0.10	0.72

(1) Rate = $k[A]^2[B]^2$ (2) Rate = $k[A][B]^2$
(3) Rate = $k[A][B]$ (4) Rate = $k[A]^2[B]$

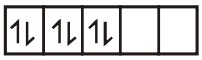
Sol. (2)

$0.045 = K(0.05)^x (0.05)^y$ ..... (1)
$0.090 = K(0.1)^x (0.05)^y$ ..... (2)
$0.72 = K(0.2)^x (0.1)^y$ ..... (3)
(1) ÷ (2) (2) ÷ (3)
x = 1 y = 2
$\therefore$ Rate = $K[A][B]^2$

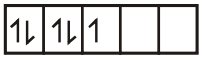
21. The correct order of the spin-only magnetic moment of metal ions in the following low-spin complexes, $[V(CN_6)]^{4-}$,$[Fe(CN)_6]^{4-}$, $[Ru(NH_3)_6]^{3+}$, and $[Cr(NH_3)_6]^{2+}$, is :
(1) $V^{2+} > Ru^{3+} > Cr^{2+} > Fe^{2+}$ (2) $Cr^{2+} > V^{2+} > Ru^{3+} > Fe^{2+}$
(3) $V^{2+} > Cr^{2+} > Ru^{3+} > Fe^{2+}$ (4) $Cr^{2+} > Ru^{3+} > Fe^{2+} > V^{2+}$

Sol. (3)

$[(CN)_6]^{4-}$ V^{+2} $3d^3$ n = 3

$[(CN)_6]^{4-}$ Fe^{+2} $3d^6$  n = 0

Back pairing

$[(NH_3)_6]^{3+}$ Ru^{3+} $4d^5$  n = 1

Back pairing

$[(NH_3)_6]^{2+}$ Cr^{2+} $3d^4$  n = 2

Back pairing

$\therefore$ $V^{2+} > Cr^{2+} > Ru^{3+} > Fe^{2+}$

n = 3

22. The lathanide ion that would show colour is :
(1) Sm^{3+} (2) Gd^{3+} (3) Lu^{3+} (4) La^{3+}

Sol. (1)

Sm^{+3} in a yellow ion

La^{3+} $4f$
Lu^{3+} $4f^{14}$ } Colour less
Gd^{3+} $4f^7$

23. 100 mL of a water sample contains 0.81 g of calcium bicrabonate and 0.73 g of magnesium bicarbonate. The hardness of this water sample expressed in terms of equivalents of $CaCO_3$ is : (Molar mass of calcium bicarbonate is 162 g mol^{-1} and magnesium bicarbonate is 146 g mol^{-1})

(1) 100 ppm (2) 1,000 ppm

(3) 10,000 ppm (4) 5,000 ppm

Sol. (3)

Equ. of $CaCO_3$ = equ. of $Ca(HCO_3)_2$ + equ. of $Mg(HCO_3)_2$

$$= \left[\frac{0.81}{162}\times 2 + \frac{0.73}{146}\times 2\right]$$

$$2 \times \text{moles of } CaCO_3 = \frac{1}{100}\times 2$$

Mass of $CaCO_3$ = 1 gm in 100 ml

$$\therefore \text{ Hardness} = \frac{1}{100}\times 10^6 = 10^4 \text{ ppm}$$

24. The quantum number of four electrons are given below :

n = 4, l = 2, m_l = −2, m_s = −1/2

n = 3, l = 2, m_l = 1, m_s = +1/2

n = 4, l = 1, m_l = 0, m_s = +1/2

n = 3, l = 1, m_l = 1, m_s = −1/2

The correct order of their increasing enegies will be :

(1) IV < III < II < I (2) IV < II < III < I

(3) I < III < II < IV (4) I < II < III < IV

Sol. (2)

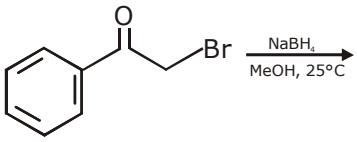
(i) 4d (ii) 3d (iii) 4p (iv) 3p

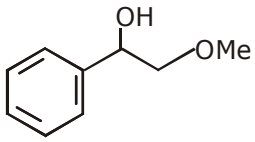
energy order

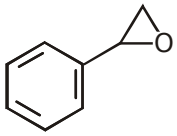
3p < 3d < 4p < 4d

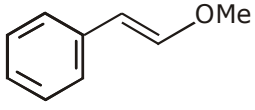
Ans. IV < II < III < I

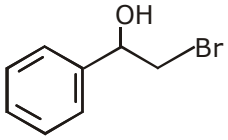
25. The major product of the following reaction is :



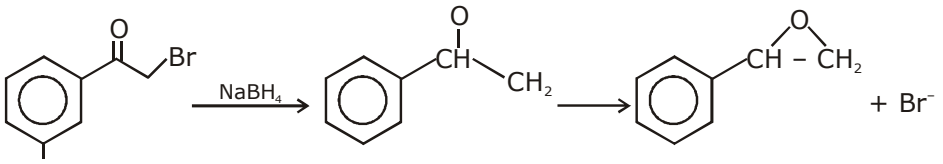
(1) 

(2) 

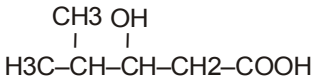
(3) 

(4) 

Sol. (2)

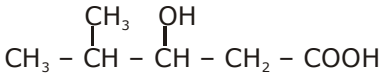


26. The IUPAC name of the following compound is :



(1) 4,4-Dimethyl-3-hydroxybutanoic acid (2) 3-Hydroxy-4-methylpentanoic acid
(3) 2-Methyl-3-hydroxypentan-5-oic acid (4) 4-Methyl-3-hydroxypentanoic acid

Sol. (2)



3-hydroxy-4-methyl pentanoic acid

27. Element 'B' forms ccp structure and 'A' occupies half of the octahedral voids, while oxygen atoms occupy all the tetrahedral voids, The structure of bimetallic oxide is :

(1) A_4B_2O (2) A_2B_2O (3) A_2BO_4 (4) AB_2O_4

Sol. (4)

$$A_{\frac{1}{2}\times 4}B_4O_8 + A_2B_4O_8 \rightarrow AB_2O_4$$

28. In the following compounds, the decreasing order of basic strength will be :

(1) $(C_2H_5)_2NH > NH_3 > C_2H_5NH_2$ (2) $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH$
(3) $C_2H_5NH_2 > NH_3 > (C_2H_5)_2NH$ (4) $(C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

Sol. (4)

$(C_2H_5)_2$ NH > $C_2H_5NH_2$ > NH_3

29. Which one of the following equations does not correctly represent the first law of thermodynamics for the given processes involving an ideal gas ? (Assume non-expansion work is zero)

(1) Cyclic process : q = –w
(2) Adiabatic process : $\Delta U = -w$
(3) Isochoric process : $\Delta U = q$
(4) Isothermal process : q = – w

Sol. (2)

Theoritical

30. Which of the following amines can be prepared by Gabriel phthalimide reaction ?

(1) n-butylamine (2) neo-pentylamine
(3) t-butylamine (4) triethylamine

Sol. (1)

Gabrial phthalimide reaction is used to formatin of 1° amine.

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