

हमारा विश्वास... हर एक विद्यार्थी है खास

JEE
MAIN
April'19

PAPER WITH SOLUTION
9 April 2019 _ Morning _ Chemistry



20000+
SELECTIONS SINCE 2007

JEE (Advanced)

4626

(Under 50000 Rank)

JEE (Main)

13953

NEET / AIIMS NTSE / OLYMPIADS

662

(since 2016)

1158

(5th to 10th class)

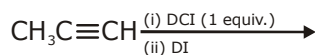
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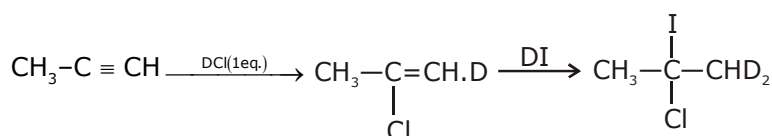
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1. The major product of the following reaction is:



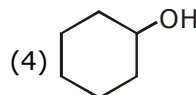
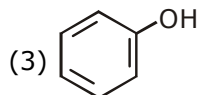
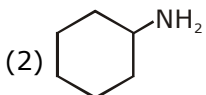
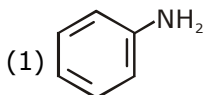
- (1) $\text{CH}_3\text{C(I)(Cl)CHD}_2$ (2) $\text{CH}_3\text{CD(I)CHD(Cl)}$
(3) $\text{CH}_3\text{CD(Cl)CHD(I)}$ (4) $\text{CH}_3\text{CD}_2\text{CH(Cl)(I)}$

Sol. (1)



2. The organic compound that gives following qualitative analysis is:

	Test	Inference
(a)	Dil. HCl	Insoluble
(b)	NaOH solution	Soluble
(c)	Br_2/water	Decolourization



Sol. (3)

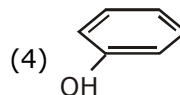
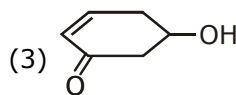
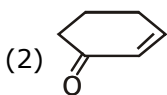
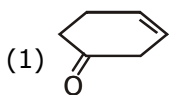
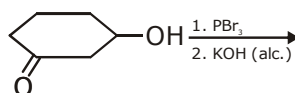
PhOH is insoluble in dil. HCl, soluble in NaOH & gives Br_2/water test.

3. Match the catalysts (Column I) with products (Column II).

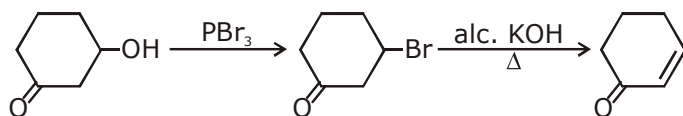
Column I Catalyst	Column II Product
(A) V_2O_5	(i) Polythylene
(B) $\text{TiCl}_4/\text{Al}(\text{Me})_3$	(ii) ethanal
(C) PdCl_2	(iii) H_2SO_4
(D) Iron Oxide	(iv) NH_3
(1) (A)-(ii); (B)-(iii); (C)-(i); (D)-(iv)	(2) (A)-(iii); (B)-(i); (C)-(ii); (D)-(iv)
(3) (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)	(4) (A)-(iv); (B)-(iii); (C)-(ii); (D)-(i)

Sol. (2)

4. The major product of the following reaction is:



Sol. (2)



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5. Among the following, the set of parameters that represents path functions, is:
 (A) $q + w$ (B) q (C) w (D) $H - TS$
 (1) (A) and (D) (2) (B), (C) and (D) (3) (B) and (C) (4) (A), (B) and (C)

Sol. (3)
 q & w are path function, rest are state function

6. For any given series of spectral lines of atomic hydrogen, let $\Delta \bar{\nu} = \bar{\nu}_{\max} - \bar{\nu}_{\min}$ be the difference in maximum and minimum frequencies is cm^{-1} . The ratio $\Delta \bar{\nu}_{\text{Lyman}} / \Delta \bar{\nu}_{\text{Balmer}}$ is:
 (1) 9 : 4 (2) 5 : 4 (3) 27 : 5 (4) 4 : 1

Sol. (1)

$$\frac{\Delta \bar{\nu}_{\text{Lyman}}}{\Delta \bar{\nu}_{\text{Balmer}}} = \frac{\left[\frac{1}{1^2} - \frac{1}{\infty^2} \right] - \left[\frac{1}{2^2} - \frac{1}{\infty^2} \right]}{\left[\frac{1}{2^2} - \frac{1}{\infty^2} \right] - \left[\frac{1}{3^2} - \frac{1}{\infty^2} \right]}$$

$$= \frac{1 - \frac{3}{4}}{\frac{1}{4} - \frac{5}{36}}$$

$$= \frac{4 - 3}{\frac{4}{9}}$$

$$= \frac{9}{4}$$

7. The element having greatest difference between its first and second ionization energies, is:
 (1) Sc (2) Ca (3) K (4) Ba

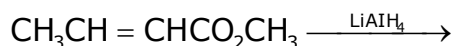
Sol. (3)

8. The degenerate orbitals of $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$ are:

- (1) d_{xz} and d_{yz} (2) d_{yz} and d_{z^2} (3) $d_{x^2-y^2}$ and d_{xy} (4) d_{z^2} and d_{xz}

Sol. (1)

9. The major product of the following reaction is:



- (1) $\text{CH}_3\text{CH}=\text{CHCH}_2\text{OH}$ (2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{CH}_3$
 (3) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ (4) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

Sol. (1)



Fee ₹ 1500

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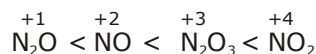
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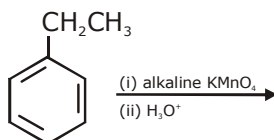
10. The correct order of the oxidation states of nitrogen in NO, N₂O, NO₂ and N₂O₃ is:

- (1) NO₂ < NO < N₂O₃ < N₂O (2) N₂O < N₂O₃ < NO < NO₂
(3) NO₂ < N₂O₃ < NO < N₂O (4) N₂O < NO < N₂O₃ < NO₂

Sol. (4)

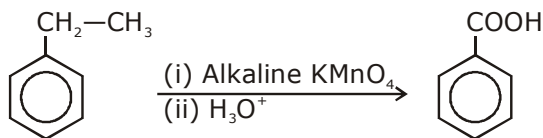


11. The major product of the following reaction is:

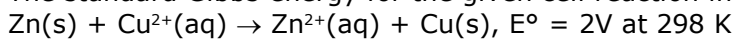


- (1) (2) (3) (4)

Sol. (1)



12. The standard Gibbs energy for the given cell reaction in kJ mol⁻¹ at 298 K is:



(Faraday's constant, F = 96000 C mol⁻¹)

- (1) 192 (2) -384 (3) -192 (4) 384

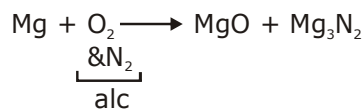
Sol. (2)

$$\begin{aligned}\Delta G &= -nFE^\circ \\ &= -2 \times 96000 \times 2 \\ &= -384 \text{ kJ/mol}\end{aligned}$$

13. Magnesium powder burns in air to give:

- (1) Mg(NO₃)₂ and Mg₃N₂ (2) MgO and Mg(NO₃)₂
(3) MgO and Mg₃N₂ (4) MgO only

Sol. (3)



14. Consider the van der Waals constants, a and b, for the following gases,

Gas	Ar	Ne	Kr	Xe
a/(atm dm ⁶ mol ⁻²)	1.3	0.2	5.1	4.1
b/(10 ⁻² dm ³ mol ⁻¹)	3.2	1.7	1.0	5.0

Which gas is expected to have the highest critical temperature?

- (1) Xe (2) Ar (3) Ne (4) Kr

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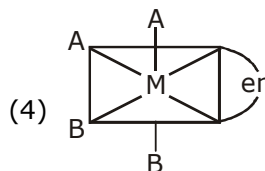
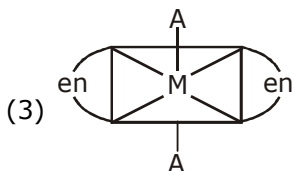
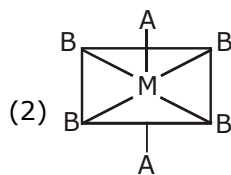
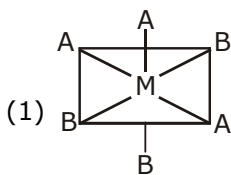
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Sol. (4)

$$T_c = \frac{8a}{27Rb}$$

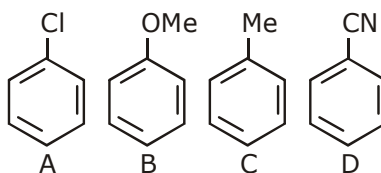
a/b for kr is maximum ie 5.1

15. The one that will show optical activity is:
(en = ethane-1, 2-diamine)



Sol. (4)

16. The increasing order of reactivity of the following compounds towards aromatic electrophilic substitution reaction is:



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

Sol. (2)

$B > C > A > D$

Rate of electrophilic substitution reaction \propto Electron donating tendency of substituted group.

17. Liquid 'M' and liquid 'N' form an ideal solution. The vapour pressures of pure liquids 'M' and 'N' are 450 and 700 mmHg, respectively, at the same temperature. Then correct statement is:
(x_M = Mole fraction of 'M' in solution; x_N = Mole fraction of 'N' in solution; y_M = Mole fraction of 'M' in vapour phase; y_N = Mole fraction of 'N' in vapour phase)

(1) $\frac{x_M}{x_N} > \frac{y_M}{y_N}$

(2) $(x_M - y_M) < (x_N - y_N)$

(3) $\frac{x_M}{x_N} < \frac{y_M}{y_N}$

(4) $\frac{x_M}{x_N} = \frac{y_M}{y_N}$

Fee ₹ 1500

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Sol. (1)

$$P_M = P_M^0 X_M = P_T Y_M \quad \dots\dots (1)$$

$$P_N = P_N^0 X_N = P_T Y_N \quad \dots\dots (2)$$

Dividing $\frac{(1)}{(2)}$

$$\frac{450}{700} \times \frac{X_M}{X_N} \times \frac{Y_M}{Y_N}$$

$$\frac{X_M}{X_N} = \frac{700}{450} \frac{Y_M}{Y_N}$$

$$\therefore \frac{X_M}{X_N} > \frac{Y_M}{Y_N}$$

18. Which of the following statements is not true about sucrose?

The glycosidic linkage is present

(1) Between C_1 of α -glucose and C_1 of β -fructose

(2) It is a non reducing sugar

(3) On hydrolysis, it produces glucose

(4) It is also named as invert sugar

Sol. (1)

In Sucrose glycosidic bond is present between C_1 of α -glucose and C_2 of fructose.

19. The aerosol is a kind of colloid in which:

(1) Solid is dispersed in gas

(2) gas is dispersed in liquid

(3) gas is dispersed in solid

(4) liquid is dispersed in water

Sol. (1)

Solid dispersed in gas.

20. C_{20} , an allotrope of carbon contains:

(1) 12 hexagons and 20 pentagons

(2) 20 hexagons and 12 pentagons

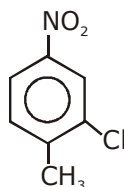
(3) 16 hexagons and 16 pentagons

(4) 18 hexagons and 14 pentagons

Sol. (2)

C_{20} an allotrope of carbon contains 12 pentagons & 20 hexagons

21. The correct IUPAC name of the following compound is:



(1) 5-chloro-4-methyl-1-nitrobenzene

(2) 3-chloro-4-methyl-1-nitrobenzene

(3) 2-methyl-5-nitro-1-chlorobenzene

(4) 2-chloro-1-methyl-4-benzene

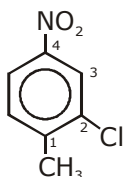
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Sol. (4)



2-chloro-1-methyl-4-nitrobenzene

22. For a reaction,
 $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$; identify dihydrogen (H_2) as a limiting reagent in the following reaction mixtures.

- (1) 35g of N_2 + 8g of H_2
 (3) 56g of N_2 + 10g of H_2

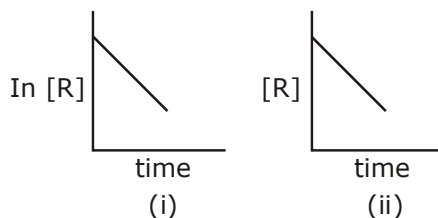
- (2) 14g of N_2 + 4g of H_2
 (4) 28g of N_2 + 6g of H_2

Sol. (3) $N_2 + 3H_2 \rightarrow 2NH_3$

$\frac{n}{\text{st. coeff.}}$	$\frac{W}{28 \times 1}$	$\frac{W}{2 \times 3}$
	$\frac{56}{28} = 2$	$\frac{10}{6} = 1.67$ (smallest)

$\therefore H_2$ is LR

23. The given plots represent the variation of the concentration of a reactant R with time for two different reactions (i) and (ii). The respective orders of the reactions are:



- (1) 1, 0 (2) 1, 1 (3) 0, 2 (4) 0, 1

Sol. (1)

For zero order

$$R_0 - R_t = kt$$

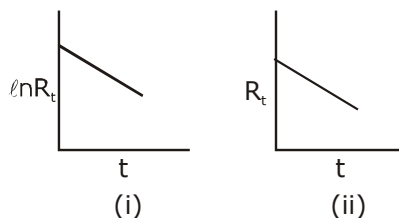
$$R_t = -Kt + R_0$$

\therefore for 1st order

$$\ln \frac{R_0}{R_t} = Kt$$

$$\ln R_0 - \ln R_t = Kt$$

$$\ln R_t = -Kt + \ln R_0$$



24. The number of water molecules(s) not coordinated to copper ion directly in $CuSO_4 \cdot 5H_2O$, is:
 (1) 3 (2) 1 (3) 2 (4) 4

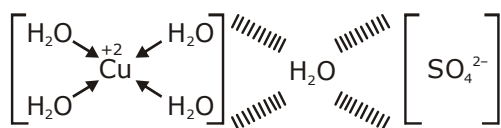
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Sol. (2)



25. The osmotic pressure of a dilute solution of an ionic compound XY in water is four times that of a solution of 0.01M BaCl₂ in water. Assuming complete dissociation of the given ionic compounds in water, the concentration of XY (in mol L⁻¹) in solution is:

- (1) 4×10^{-4} (2) 16×10^{-4} (3) 4×10^{-2} (4) 6×10^{-2}

Sol. (4)

$$\frac{\pi_1 = i_1 c_1 RT}{\pi_2 = i_2 c_2 RT} \quad \begin{matrix} (XY) \\ (BaCl_2) \end{matrix}$$

$$\frac{4x}{x} = \frac{2 \times 0.01}{3 \times 0.01}$$

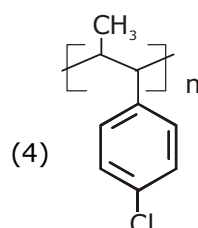
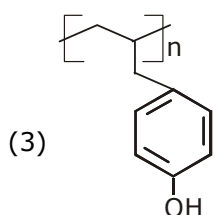
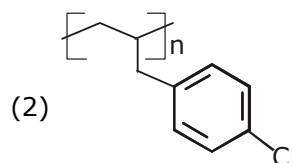
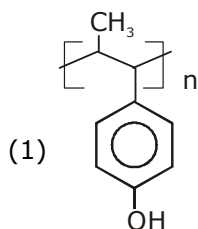
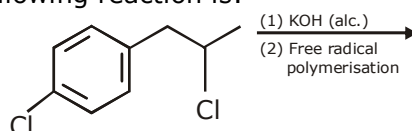
$$\frac{12 \times 0.01}{2} = C_1$$

$$\Rightarrow C_1 = 0.06$$

26. Excessive release of CO₂ into the atmosphere results in:
(1) global warming (2) polar vortex
(3) depletion of ozone (4) formation of smog

Sol. (1)
Factual

27. The major product of the following reaction is:



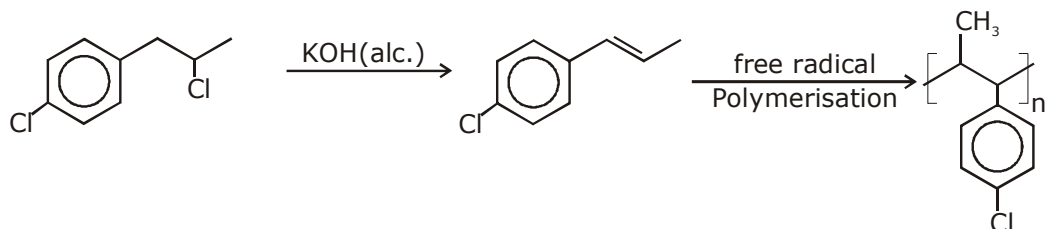
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Sol. (4)



28. The ore that contains the metal in the form of fluoride is:

- (1) magnetite (2) sphalerite (3) cryolite (4) malachite

Sol. (3)

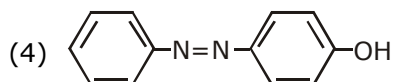
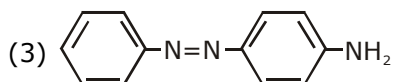
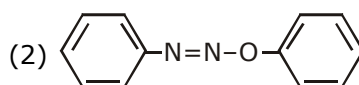
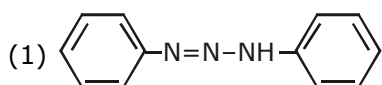
29. Among the following, the molecule expected to be stabilized by anion formation is:

C_2 , O_2 , NO , F_2

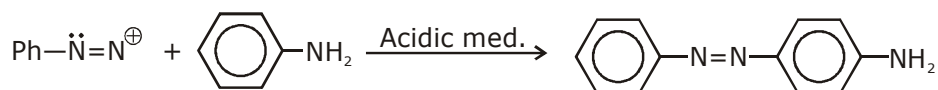
- (1) C_2 (2) O_2 (3) F_2 (4) NO_2

Sol. (1)

30. Aniline dissolved in dilute HCl is reacted with sodium nitrite at $0^\circ C$. This solution was added dropwise to a solution containing equimolar mixture of aniline and phenol in dil. HCl. The structure of the major product is:



Sol. (3)



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मोशन ने बनाया साधारण को असाधारण

JEE Main Result Jan'19

4 RESIDENTIAL COACHING PROGRAM (DRONA) STUDENTS ABOVE 99.9 PERCENTILE

 <p>99.9 percentile PHYSICS 100 percentile Nitin Gupta</p> <p>Exp. Score 335 Last yr Score 149</p>	 <p>99.9 percentile Shiv Modi</p> <p>Exp. Score 318 Last yr Score 153</p>	 <p>99.9 percentile Ritik Bansal</p> <p>Exp. Score 308 Last yr Score 218</p>	 <p>99.9 percentile Shubham Kumar</p> <p>Exp. Score 300 Last yr Score 153</p>
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Total Students Above 99.9 percentile - **17**

Total Students Above 99 percentile - **282**

Total Students Above 95 percentile - **983**

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

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 प्रत्येक 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	Above 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 बच्चों के लिए **50%** छात्रवृत्ति

प्री-मेडिकल में छात्राओं को **50%** छात्रवृत्ति