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# JEE (MAIN) 2025

MEMORY BASED QUESTIONS & TEXT SOLUTION

**SHIFT-2**

**DATE & DAY:** 28<sup>th</sup> January 2025 & Tuesday

**PAPER-1**

Duration: 3 Hrs.

Time: 03:00 PM – 06:00 PM

**SUBJECT: CHEMISTRY**

Selections in JEE (Advanced)/  
IIT-JEE Since 2002

**52395**

Selections in JEE (Main)/  
AIEEE Since 2009

**257576**

Selections in NEET (UG)/  
AIPMT/AIIMS Since 2012

**22494**

## PART : CHEMISTRY

1. Which of the following has maximum oxidizing power

- (1)  $\text{VO}_2^{\oplus}$                       (2)  $\text{Cr}_2\text{O}_7^{2-}$                       (3)  $\text{MnO}_4^{\ominus}$                       (4)  $\text{TiO}_2$

Ans. (3)

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2. A Solution contain 40% (w/w)  $\text{HNO}_3$ , with density 1.25 gram / ml, then Find volume of solution which contain 30 gram of  $\text{HNO}_3$ .

- (1) 60 ml.                      (2) 100 ml.                      (3) 75 ml.                      (4) 50 ml.

Ans. (1)

Sol. 
$$M = \frac{\%(\text{w/w}) \times 10d}{\text{GMM}}$$

$$M = \frac{40 \times 10 \times 1.25}{63}$$

$$M = \frac{30 \times 1000}{V_m \times 63} = \frac{40 \times 10 \times 1.25}{63} = \frac{300}{V} = 4 \times 1.25$$

$$V = \left[ \frac{300}{4 \times 1.25} \right] = \left[ \frac{300}{5} \right] = 60 \text{ ml}$$

Ans. =60 ml.

3.  $\text{A} + \text{B} \longrightarrow \text{C} + \text{D}$  for the above elementary reaction if volume of container is reduced  $\frac{1}{3}$  of initial volume, then rate of reaction become \_\_\_\_\_ of initial rate

- (1) 9                      (2)  $\frac{1}{9}$                       (3) 3                      (4)  $\frac{1}{3}$

Ans. (1)

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4. Which of the following code of compound is yellow in colour.

- (a)  $\text{CdS}$                       (b)  $\text{PbS}$                       (c)  $\text{CuS}$                       (d)  $(\text{NH}_4)_2\text{SO}_4$   
 (1) a, b only                      (2) a, c, d only                      (3) a, d only                      (4) c, d only

Ans. (3)

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5. How many of the following compound are paramagnetic in colour.

$O_2$ ,  $O_2^{\oplus}$ ,  $O_2^{\ominus}$ , NO, CO,  $[Co(NH_3)_6]^{3+}$ ,  $[Ni(CN)_4]^{2-}$ ,  $NO_2$

Ans. 5

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6. Identify the correct increasing order of solubility of HgS, PbS, AgBr,  $Ca(OH)_2$ .

- (1)  $HgS < PbS < AgBr < Ca(OH)_2$                       (2)  $PbS < HgS < Ca(OH)_2 < AgBr$   
(3)  $AgBr < PbS < HgS < Ca(OH)_2$                       (4)  $Ca(OH)_2 < HgS < AgBr < PbS$

Ans. (1)

Sol.

	Salt	$K_{sp}$
1.	AgBr	$5 \times 10^{-13}$
2.	HgS	$4 \times 10^{-53}$
3.	PbS	$8 \times 10^{-28}$
4.	$Ca(OH)_2$	$5.5 \times 10^{-6}$

7. Bohr's model is applicable for hydrogen atom, the dependency of frequency of rotation of electron in  $n^{\text{th}}$  principal quantum number is proportional to \_\_\_\_\_

- (1)  $\frac{1}{n^2}$                       (2)  $\frac{1}{n^3}$                       (3)  $n^3$                       (4)  $n^2$

Ans. (2)

Sol.  $F \propto \left(\frac{Z}{n}\right) \left(\frac{Z}{n^2}\right)$

$$F \propto \frac{Z^2}{n^3}$$

8. From the following oxide of Vanadium,  $V_2O_3$ ,  $V_2O_4$  and  $V_2O_5$ , the oxidation state of Vanadium in product when amphoteric oxide reacts with base.

- (1) 4                      (2) 5                      (3) 3                      (4) 1

Ans. (2)

Sol.  $\overset{+5}{V_2O_5} \xrightarrow{\text{Base}} \overset{+5}{VO_4}{}^{3-}$

9. A group 15 element can form  $d\pi - d\pi$  bond with transition element and form most basic hydride among other element of group which can form  $d\pi - d\pi$  bond with transition element, then atomic number of that element is \_\_\_\_\_.

Ans. 15



**Sol.** 15<sup>th</sup> group – N, P, As, Sb, Bi

Only P, As, Sb, Bi can form  $d\pi - d\pi$  bond.

Hydride  $\Rightarrow$   $\text{PH}_3, \text{AsH}_3, \text{SbH}_3, \text{BiH}_3$

$\text{PH}_3$  is most basic

So, atomic number of P = 15

Ans. = 15

**10.** Identify the correct order of energy in hydrogen atom.

(1)  $1s < 2s < 3p < 3d$

(2)  $1s < 2s = 2p < 3s = 3p = 3d$ .

(3)  $1s < 2s < 2p < 3s < 3p < 3d$ .

(4)  $1s = 2s = 2p = 3s = 3p = 3d$ .

**Ans.** (2)

**Sol.** [Watch Video Solution](#)

**11.** Match the following.

	List-I	List-II
a	$[\text{CoF}_6]^{3-}$	(i) $sp^3d^2$
b	$[\text{Co}(\text{NH}_3)_6]^{3+}$	(ii) $d^2sp^3$
c	$[\text{NiCl}_4]^{2-}$	(iii) $sp^3$
d	$[\text{Ni}(\text{CN})_4]^{2-}$	(iv) $dsp^2$

(1) a – I, b – II, c – III, d – IV

(2) a – II, b – I, c – III, d – IV

(3) a – I, b – II, c – IV, d – III

(4) a – II, b – I, c – IV, d – III

**Ans.** (1)

**Sol.** [Watch Video Solution](#)

**12. Consider the following statements**

**Statement-I :** In law of octaves, elements were arranged in increasing order of their atomic numbers.

**Statement-II:** Lothar meyer, plotted the physical properties against atomic weight.

Choose the correct answer from the options given below.

(1) Both statement-I and Statement-II are correct.

(2) Both statement-I and Statement-II are incorrect.

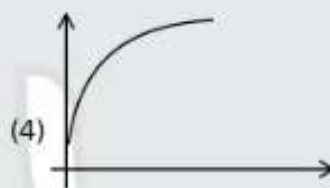
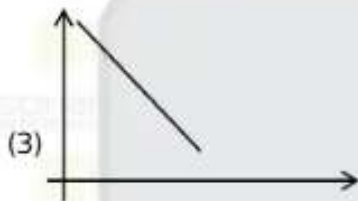
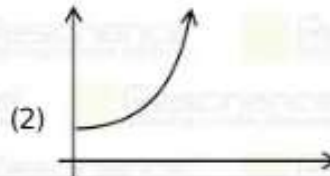
(3) Statement-I is correct but statement-II is incorrect.

(4) Statement-I is incorrect but statement-II is correct.

**Ans.** (4)

**Sol.** [Watch Video Solution](#)

13. In a bacterial growth similar to radioactive decay, if ' $N_0$ ' is initial population, and population at time ' $t$ ' is  $N$ , then pick correct plot for  $\frac{N}{N_0}$  vs  $t$



Ans. (2)

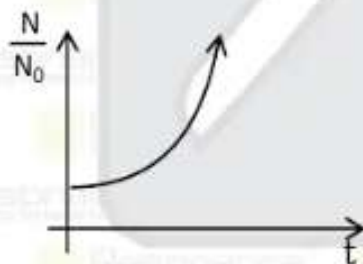
Sol.  $\because \lambda > 0$

$$\frac{dN}{dt} = \lambda N \rightarrow \text{growth like radioactive decay}$$

$$\int_{N_0}^N \frac{dN}{N} = \int_0^t \lambda dt \Rightarrow \ln\left(\frac{N}{N_0}\right) = \lambda t$$

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

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



Ans. (2)

14. When current is pass from 600 ml NaCl solution for 10 min, pH of solution is increase upto 12, then current is \_\_\_\_\_  $\times 10^{-3}$  amp (Nearest integer)  
(assuming 100% efficiency &  $F = 96500C$ )

Ans. 965

**Sol.** Initially  $\Rightarrow$  pH = 7  $\Rightarrow$   $[H^+] = [OH^-] = 10^{-7}$

Finally  $\Rightarrow$  pH = 12  $\Rightarrow$   $[H^+] = 10^{-12}$

$\Rightarrow$   $[OH^-] = 10^{-2}$

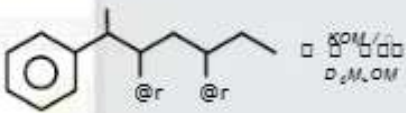
At cathode  $\Rightarrow 2H_2O + 2e^- \rightarrow H_2(g) + 2OH^-(aq)$   $10^{-2}$

$0.6 \times 10^{-2}$  mole.  $(10^{-2} \times 0.6)$  mole

$Q = it = i \times 10 \times 60 = 6 \times 10^{-3} \times 96500$

$i = 0.965$  amp.

Ans. = 965

**15.**  Major product, Major product is

(1) 2-Phenylhepta-2,5-diene

(2) 2-Phenylhepta-3,5-diene

(3) 2-Phenylhepta-2,4-diene

(4) 2-Phenylheptane-3,5-diol

**Ans. (3)**

**Sol. Watch Video Solution**

**16.**  $CH_3-C \equiv CH \xrightarrow[\text{H}_2]{\text{Pd/C}}$  A  $\xrightarrow[2. H_2O, Zn]{1. O_3}$  B + C

What are A, B & C respectively in the given reaction

(1)  $CH_3-CH_2-CH_3$ ,  $CH_3-CH=CH_2$ , HCHO

(2)  $CH_3-CH=CH_2$ ,  $CH_3-CH=O$ , HCHO

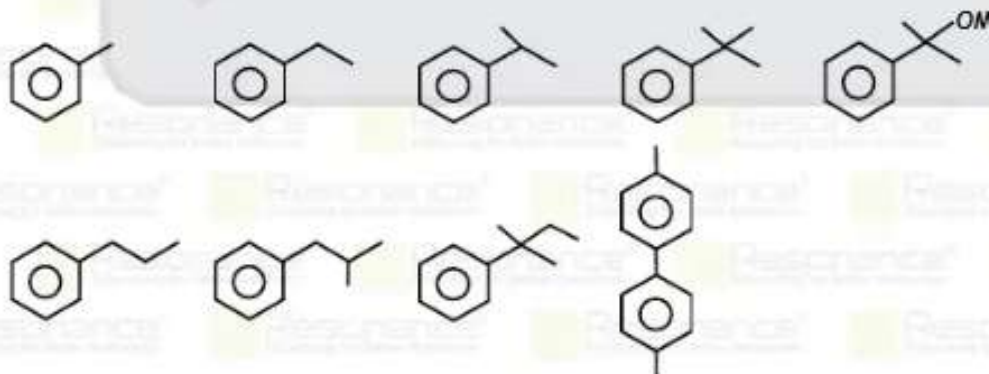
(3)  $CH_3-CH=CH_2$ ,  $CH_3-CH=O$ , HCOOH

(4)  $CH_3-CH=CH_2$ ,  $CH_3-CH=O$ ,  $CH_3-OH$

**Ans. (2)**

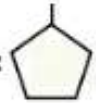

**Sol. Watch Video Solution**

**17.** How many of the following will give Benzoic acid on oxidation with  $KMnO_4$



**Ans. (5)**



18. **Statement-I :**  and  are isomeric pair

**Statement-II :**  and  NH<sub>2</sub> are functional isomers

- (1) Both Statement I and statement II are true
- (2) Both statement I and statement II are false
- (3) Statement I is true but statement II is false
- (4) Statement I is false but statement II is true

**Ans. (1)**

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19. Match the Column I with Column II :

Column - I		Column - II	
(A)	Sucrose	(P)	$\beta, \beta$ 1-4
(B)	Cellulose	(Q)	$\alpha, \alpha$ 1-4 and 1-6
(C)	Lactose	(R)	$\alpha, \beta$ 1-4
(D)	Amylopectin	(S)	$\alpha, \beta$ 1-2

	A	B	C	D	A	B	C	D	
(1)	S	R	P	Q	(2)	P	R	P	S
(3)	S	P	P	Q	(4)	S	R	P	P

**Ans. (3)**

**Sol. Watch Video Solution**

20. Which of the following statements are incorrect

- (a) 1<sup>o</sup> amines give carbylamines reaction.
- (b) 2<sup>o</sup> and 3<sup>o</sup> amines give carbylamine reaction.
- (c) Benzenesulphonyl chloride is also known as Hinsberg reagent.
- (d) Aromatic and Aliphatic both give Carbylamine reaction.
- (e) Benzene sulphonylchloride is used in Cabylamine reaction with CHCl<sub>3</sub> and KOH.

- (1) b and c only
- (2) b and e only
- (3) c, d, e only
- (4) d and e only

**Ans. (2)**

**Sol. Watch Video Solution**

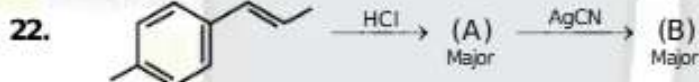
21. Identify correct statements for the acidic hydrolysis of the following

- (a) Starch gives Galactose
- (b) Cane sugars gives Glucose and Fructose in equal amount on Hydrolysis
- (c) Milk sugar gives Glucose and Galactose
- (d) Amylopectin gives Glucose and Fructose
- (e) Amylose gives only Glucose

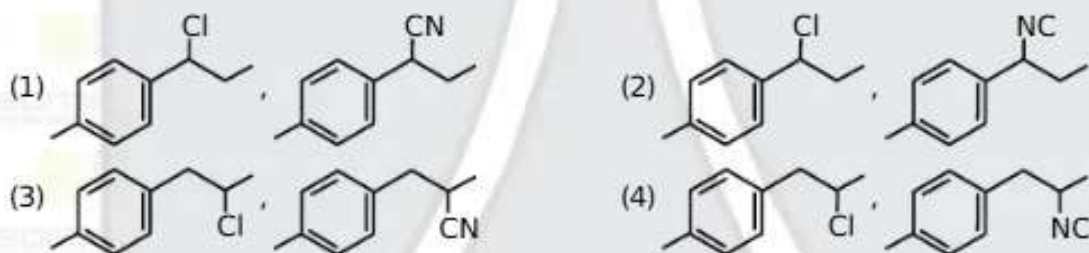
- (1) a and b only      (2) b and c only      (3) a and d only      (4) c and d only

Ans. (2)

Sol. Watch Video Solution



A and B are respectively



Ans. (2)

Sol. Watch Video Solution