

CHEMISTRY, MATHEMATICS & PHYSICS RANK IMPROVEMENT TEST – X

Pattern-5

Time Allotted : 3 Hours

Maximum Marks: 183

INSTRUCTIONS

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

Caution: Question Paper CODE as given above MUST be correctly marked in the answer OMR sheet before attempting the paper. Wrong CODE or no CODE will give wrong results.

A. General Instructions

- ✓ Attempt ALL the questions. Answers have to be marked on the OMR sheets.
- ✓ This question paper contains **Three Sections**.
- ✓ **Section – I** is “Chemistry”, **Section – II** is “Mathematics” and **Section – III** is “Physics”.
- ✓ Each Section is further divided into two Parts: **Part – A & Part – C**.
- ✓ Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
- ✓ Blank Papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.

B. Filling of OMR Sheet

1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
2. On the OMR sheet, darken the appropriate bubble with HB pencil for each character of your Enrolment No. and write in ink your Name, Test Centre and other details at the designated places.
3. OMR sheet contains alphabets, numerals & special characters for marking answers.

C. Marking Scheme For All Three Parts.

- (i) **PART-A (01 – 07)** contains 7 Multiple Choice Questions which have **One or More Correct** answer. For each question in the group **Q. 1 – 7** of **PART – A** you will be awarded
Full Marks: +4 if only the bubble(s) corresponding to all the correct option(s) is (are) darkened.
Partial Marks: +1 For darkening a bubble corresponding to **each correct option**, provided NO incorrect option is darkened.
Zero Marks: 0 if none of the bubbles is darkened.
Negative Marks: –1 In all other cases.
- For example, if **(A), (C) and (D)** are all the correct options for a question, darkening all these three will result in **+4 marks**; darkening only **(A) and (D)** will result in **+2 marks**; and darkening **(A) and (B)** will result in **–1** marks, as a wrong option is also darkened.
- PART-A (08 - 13)** contains 2 Tables with 3 Columns and 4 Rows has three questions. Column 1 will be with 4 rows designated (I), (II), (III) and (IV). Column 2 will be with 4 rows designated (i), (ii), (iii) and (iv). Column 3 will be with 4 rows designated (P), (Q), (R) and (S). Each question has four options with **only one correct**.
Full Marks : +3 if only the bubble corresponding to the correct answer is darkened
Zero Marks : 0 if none of the bubbles is darkened
Negative Marks : –1 In all other cases
- (ii) **PART-B** valid for this paper as matrix match is not there.
- (iii) **PART-C (01 – 05)** contains 5 Numerical Based questions with Single Digit Integer as answer, ranging from 0 to 9 and each question carries **+3 marks** for correct answer. No negative marks will be awarded in this section.

Name of Candidate :

Batch ID : Date of Examination : / / 2 0 1

Enrolment Number :

SECTION-I : CHEMISTRY

PART – A

(Multi Correct Choice Type)

This section contains 7 **multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

1. Consider the cell
 $\text{Ag(s), AgCl(s) | KCl(0.1 M) | Hg}_2\text{Cl}_2\text{(s) | Hg(l) | Pt}$
 The cell potential
 (A) increases on increasing concentration of Cl^- ions
 (B) decreases on decreasing concentration of Cl^- ions
 (C) is independent of concentration of Cl^- ions
 (D) is independent of amount of AgCl & Hg_2Cl_2
 1. CD

2. Two litres solution of a buffer mixture containing 1.0 M NaH_2PO_4 and 1.0 M Na_2HPO_4 is placed in two compartments (one litre in each) of an electrolytic cell. The platinum electrodes were inserted in each compartment and 1.25 A current in passed for 965 minutes. Assuming that only electrolysis of water takes place in each compartment. Which will be the pH in each compartment after passage of above charge?
 $p_{K_{a_1}}(\text{H}_3\text{PO}_4) = 1$ $p_{K_{a_2}}(\text{H}_3\text{PO}_4) = 2.15$ $p_{K_{a_3}}(\text{H}_3\text{PO}_4) = 6.0$
 $\log_{10}(5) = 0.7$ $\log_{10}(7) = 0.85$
 (A) Anode : 3.00 (B) Cathode : 3.00
 (C) Anode : 1.30 (D) Cathode : 1.30
 2. BC

3. Which of the following pair consists of ore of same metal?
 (A) Bauxite, limonite (B) Haematite, siderite
 (C) Cinnabar, Cassiterite (D) Galena, cerrusite
 3. BD

4. Aluminothermic process used for spot welding of large iron structure is based upon fact that
 (A) as compared to iron, aluminium has greater affinity for oxygen
 (B) as compared to aluminium, iron has greater affinity for oxygen
 (C) reaction between aluminium & oxygen is endothermic
 (D) reaction between iron oxide and aluminium is exothermic
 4. AD

5. Identify correct statement(s) about ozone.
 (A) It is thermodynamically unstable with respect for oxygen
 (B) the conversion of O_2 to O_3 is endothermic
 (C) in conversion of O_2 to O_3 there is decrease in entropy
 (D) ozone is diamagnetic in nature
 5. ABCD

6. Which of the following arrangements truly represent properly indicate against it?
 (A) $\text{Br}_2 < \text{Cl}_2 < \text{F}_2$ (Bond energy) (B) $\text{Br}_2 < \text{Cl}_2 < \text{F}_2$ (oxidizing power)
 (C) $\text{Br} < \text{Cl} < \text{F}$ (Electronegativity) (D) $\text{Br} < \text{Cl} < \text{F}$ (Electron affinity)
 6. BC

7. XeO_3 is formed as a product in complete or partial hydrolysis of
 (A) XeF_2 (B) XeF_4
 (C) XeF_6 (D) XeOF_4
 7. BCD

(Single Option Correct)

Matching the columns and answer the following questions according to VBT

Column – I (Compound)		Column – II (Hybridization)		Column – III	
(I)	XeF ₂	(i)	sp ²	(P)	Polar
(II)	I ₂ Cl ₆	(ii)	sp ³	(Q)	Non-polar
(III)	SO ₂	(iii)	sp ³ d	(R)	1 pπ - dπ bonding
(IV)	XeO ₂ F ₂	(iv)	sp ³ d ²	(S)	2 pπ - dπ bonding

8. Which of the following is correct combination?
 (A) (I), (iii) & (P) (B) (II), (iv) & (Q)
 (C) (III), (ii) & (P) (D) (III), (i) & (S)
8. B
9. Which of the following is correct combination?
 (A) (IV), (ii) & (P) (B) (II), (iii) & (P)
 (C) (IV), (iii) & (R) (D) (III), (i) & (R)
9. D
10. Which of the following is incorrect combination?
 (A) (I), (iii) & (Q) (B) (III), (i) & (P)
 (C) (III), (i) & (R) (D) (III), (i) & (S)
10. D

Column I, II & III contains cell representation, type & electrode potential respectively.

Column – I		Column – II		Column – III	
(I)	Pt, H ₂ (1 atm) H ⁺ (10 ⁻³ M) H ⁺ (10 ⁻⁶ M) H ₂ (1 atm) Pt	(i)	Spontaneous	(P)	E _{cell} = -0.13 V
(II)	Pt, F ₂ (g)(1atm) F ⁻ (10 ⁻² M) F ⁻ (10 ⁻³ M) F ₂ (g) (2 atm) Pt	(ii)	Non-spontaneous	(Q)	E _{cell} = -0.177 V
(III)	Hg, Hg ₂ Cl ₂ (s) KCl (1 M) H ⁺ (pH = 10) Q, QH ₂ Pt $\left(\begin{array}{l} E_{\text{QH}_2/\text{H}_2\text{O}}^0 = 0.7\text{V} \\ E_{\text{SCE}}^0 = 0.24\text{V} \end{array} \right)$	(iii)	Exergonic	(R)	E _{cell} = 0.582 V
(IV)	Q + 2H ⁺ (pH = 2) + 2e ⁻ → QH ₂ (aq) E _{cell} ^o = 0.7	(iv)	Endergonic	(S)	E _{cell} = 0.069 V

11. For the cell given in column-I, the only correct combination is
 (A) (I), (ii) & (P) (B) (I), (ii) & (Q)
 (C) (I), (iv) & (R) (D) (I), (iv) & (S)
11. B

12. For the cell given in column-I, the only correct combination is
 (A) (III), (iv) & (P) (B) (III), (iii) & (Q)
 (C) (III), (ii) & (R) (D) (III), (ii) & (S)
12. A
13. For the cell given in column-I, the only correct combination is
 (A) (IV), (iii) & (S) (B) (IV), (iii) & (R)
 (C) (IV), (i) & (Q) (D) (IV), (ii) & (P)
13. B

PART – C
(Integer Type)

This section contains 5 questions. The answer to each question is a **single-digit integer**, ranging from 0 to 9. The correct digit below the question number in the ORS is to be bubbled.

1. What is quantity of electricity(In Faraday) required for reduction of 1g-molecule of Fe_2O_3 to Fe. (Atomic mass of Fe = 56 amu)
1. 6
2. Equivalent conductance at infinite dilution of NH_4Cl , NaOH & NaCl are 129.8, 217.4 & 108.9 $\text{s cm}^2\text{mol}^{-1}$, respectively of equivalent conductance of 0.01 N solution of NH_4OH is 9.532 $\text{s cm}^2\text{mol}^{-1}$, the calculate percentage degree of dissociation of NH_4OH at this temperature.
2. 2
3. According to VBT & hybridisation. The number of $p\pi - d\pi$ bonds in S_3O_9
3. 6
4. In how many of following compound redox reaction occur in which anion oxidizes cation on heating
 NH_4NO_3 , NH_4NO_2 , $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$, NH_4Cl , NH_4ClO_4 , $\text{Mg}(\text{ClO}_4)_2$, $\text{Fe}(\text{ClO}_4)_2$
4. 5
5. The reduction of FeO with CO gas in co-current flow is given by the following equation
 $\text{FeO} + \text{CO} \rightleftharpoons \text{Fe} + \text{CO}_2 \quad \Delta G^\circ = 18.98 \text{ kJ at } 1173 \text{ K}$
 The ratio of $P_{\text{CO}} / P_{\text{CO}_2}$ for this reaction
 (Write the nearest integer)
 (Use if needed $\log_{10}3 = 0.48$, $\log_{10}5 = 0.7$, $\log_{10}7 = 0.845$)
5. 7

Space for rough work

SECTION-II : MATHEMATICS

PART – A

(Multi Correct Choice Type)

This section contains 7 **multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

1. If the volume of a parallelepiped, whose coterminous edges are given by the vectors $\vec{a} = \hat{i} + \hat{j} + n\hat{k}$, $\vec{b} = 2\hat{i} + 4\hat{j} - n\hat{k}$ and $\vec{c} = \hat{i} + n\hat{j} + 3\hat{k}$ ($n \geq 0$), is 158 cubic. Units. then:

- (A) $\vec{a} \cdot \vec{c} = 14$ (B) $n=8$
 (C) $\vec{b} \cdot \vec{c} = 10$ (D) $n=9$

1. BC

2. Consider the lines:

$$L_1 := \frac{x-2}{1} = \frac{y-1}{7} = \frac{z+2}{-5}$$

$$L_2 : x-4 = y+3 = -z$$

Then which of the following is/are correct?

- (A) Point of intersection of L_1 and L_2 is $(1, -6, 3)$
 (B) Equation of plane containing L_1 and L_2 is $x + 2y + 3z + 2 = 0$
 (C) Acute angle between L_1 and L_2 is $\cot^{-1}\left(\frac{13}{15}\right)$
 (D) Equation of plane containing L_1 and L_2 is $x + 2y + 2z + 3 = 0$

2. **ABC**

3. If $a^2 + b^2 + c^2 = 1$, then
- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| $a^2 + (b^2 + c^2)\cos\phi$ | $ab(1 - \cos\phi)$ | $ac(1 - \cos\phi)$ |
| $ba(1 - \cos\phi)$ | $b^2 + (c^2 + a^2)\cos\phi$ | $bc(1 - \cos\phi)$ |
| $ca(1 - \cos\phi)$ | $cb(1 - \cos\phi)$ | $c^2 + (a^2 + b^2)\cos\phi$ |

is independent of

- (A) a (B) b
 (C) c (D) ϕ

3. **ABC**

4. If OABC is a tetrahedron with equal edges and $\hat{p}, \hat{q}, \hat{r}$ are unit vectors along bisectors of $\overline{OA}, \overline{OB} : \overline{OB}, \overline{OC} : \overline{OC}, \overline{OA}$ respectively and $\hat{a} = \frac{\overline{OA}}{|\overline{OA}|}$, $\hat{b} = \frac{\overline{OB}}{|\overline{OB}|}$, $\hat{c} = \frac{\overline{OC}}{|\overline{OC}|}$, then:

- (A) $\frac{[\hat{a} \ \hat{b} \ \hat{c}]}{[\hat{p} \ \hat{q} \ \hat{r}]} = \frac{3\sqrt{3}}{2}$ (B) $\frac{[\hat{a} + \hat{b} \ \hat{b} + \hat{c} \ \hat{c} + \hat{a}]}{[\hat{p} + \hat{q} \ \hat{q} + \hat{r} \ \hat{r} + \hat{p}]} = \frac{3\sqrt{3}}{4}$
 (C) $\frac{[\hat{a} + \hat{b} \ \hat{b} + \hat{c} \ \hat{c} + \hat{a}]}{[\hat{p} \ \hat{q} \ \hat{r}]} = \frac{3\sqrt{3}}{2}$ (D) $\frac{[\hat{a} \ \hat{b} \ \hat{c}]}{[\hat{p} + \hat{q} \ \hat{q} + \hat{r} \ \hat{r} + \hat{p}]} = \frac{3\sqrt{3}}{4}$

4. **AD**

5. The lines
 $\vec{r} = (\hat{i} - \hat{j}) + \ell (2\hat{i} + \hat{k})$ and
 $\vec{r} = (2\hat{i} - \hat{j}) + m(\hat{i} + \hat{j} - \hat{k})$

Then which of the following is/are incorrect?

- (A) intersect when $\ell = 2$ and $m = \frac{1}{2}$
 (B) intersect when $\ell = 1$ and $m = 2$
 (C) do not intersect for any values of ℓ and m
 (D) intersect for all values of ℓ and m

5. ABD

6. Let $a, b, c \in \mathbb{R}$ be all non-zero and satisfy $a^3 + b^3 + c^3 = 2$. If the matrix $A = \begin{pmatrix} a & b & c \\ b & c & a \\ c & a & b \end{pmatrix}$

satisfies $A^T A = I$, then a value of abc can be

- (A) $\frac{1}{3}$ (B) 1
 (C) $-\frac{1}{3}$ (D) $\frac{2}{3}$

6. AB

7. Let A be a 2×2 real matrix with entries from $\{0, 1\}$ and $|A| \neq 0$. Consider the following two statements;

(P) If $A \neq I_2$, then $|A| = -1$

(Q) If $|A| = 1$, then $\text{tr}(A) = 2$

where I_2 denotes 2×2 identity matrix and $\text{tr}(A)$ denotes the sum of the diagonal entries of A .

Then which of the following is/are incorrect?

- (A) Both (P) and (Q) are true (B) Both (P) and (Q) are false
 (C) (P) is true and (Q) are false (D) (P) is false and (Q) is true

7. ABC

11. B
12. Which of the following option is the only **INCORRECT** combination?
 (A) (II) (iii) (Q) (B) (III) (i) (Q)
 (C) (I) (iii) (P) (D) (II) (iii) (S)
12. B
13. Which of the following options is the only **CORRECT** combination?
 (A) (I) (i) (P) (B) (II) (ii) (Q)
 (C) (IV) (iv) (S) (D) (III) (iii) (R)
13. D

PART – C
(Integer Type)

This section contains 5 **questions**. The answer to each question is a **single-digit integer**, ranging from 0 to 9. The correct digit below the question number in the ORS is to be bubbled.

14. If the distance between the plane $Ax - 2y + z = d$ and the plane containing the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ is $\sqrt{6}$, then value of $|d|$ is
14. **6**
15. Given a tetrahedron DABC with $AB = 12$, $CD = 6$. If the shortest distance between the skew line AB and CD is 8 and the angle between them is $\frac{\pi}{6}$, then if the volume of tetrahedron is V , then $\sqrt{\frac{V}{3}}$ equals
15. **4**
16. Let $(\vec{p} \times \vec{q}) \times \vec{r} + (\vec{q} \cdot \vec{r})\vec{q} = (x^2 + y^2)\vec{q} + (14 - 4x - 6y)\vec{p}$ and $\vec{p} \cdot \vec{r} = 1$ where \vec{p} and \vec{q} are two non-zero non collinear vectors and x and y are scalars then the value of $(x + y)$ is
16. **5**
17. If $D_1 = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}$ and $D_2 = \begin{vmatrix} a_1 + 2a_2 + 3a_3 & 5a_2 & a_3 \\ b_1 + 2b_2 + 3b_3 & 5b_2 & b_3 \\ c_1 + 2c_2 + 3c_3 & 5c_2 & c_3 \end{vmatrix}$ then $\frac{D_2}{D_1}$ is equal to
17. **5**
18. If $A = \begin{vmatrix} 1+a^2+a^4 & 1+ab+a^2b^2 & 1+ac+a^2c^2 \\ 1+ab+a^2b^2 & 1+b^2+b^4 & 1+bc+b^2c^2 \\ 1+ac+a^2c^2 & 1+bc+b^2c^2 & 1+c^2+c^4 \end{vmatrix}$, $a, b, c \in \mathbb{R}$ and $|A| = |4I|$ (where I is identity matrix and if $k = (a-b)^3 + (b-c)^3 + (c-a)^3$ then $\frac{|k|}{6} =$
18. **4**

Space for rough work

SECTION-III : PHYSICS

PART – A

(Multi Correct Choice Type)

This section contains 7 **multiple choice questions**. Each question has four choices (A), (B), (C) and (D) out of which **ONE OR MORE** may be correct.

1. The pitch of a screw gauge is 1 mm and there are 100 divisions on circular scale. When there is nothing between the two ends (studs) of screw gauge 95th divisions of circular scale is coinciding with screw gauge and in this situation zero of main scale is not visible. When a wire is placed between the studs the linear scale reads 2 division and 20th divisions of circular scale coincides with reference line. For this situation mark the correct statement(s). Each division on the main scale is 1 mm.
- (A) LC of the instrument is 0.01 mm.
 (B) Zero correction for the instrument is +0.05 mm.
 (C) Thickness of wire is 1.20 mm
 (D) Thickness of the wire is 2.25 mm.

1. **ABD**

2. If the dimensions of length are expressed as $G^x c^y h^z$; where G, c and h are the universal gravitational constant, speed of light and Planck's constant respectively, then

(A) $x = \frac{1}{2}, y = \frac{1}{2}$

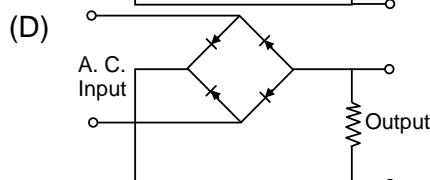
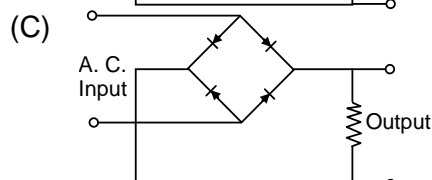
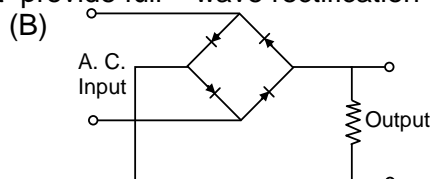
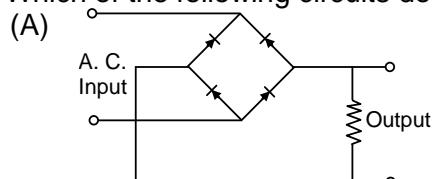
(B) $x = \frac{1}{2}, z = \frac{1}{2}$

(C) $y = \frac{1}{2}, z = \frac{3}{2}$

(D) $y = -\frac{3}{2}, z = \frac{1}{2}$

2. **BD**

3. Which of the following circuits does not provide full – wave rectification of an a.c. input?



3. **ABC**

4. Zener diodes are primarily used for:

(A) Voltage Regulator

(B) amplification

(C) stabilization of voltage

(D) production of carrier waves

4. **AC**

5. Select the correct statement with reference to Amplifier Circuits :

(A) In a P – N – P type common base amplifier the input and output are in the same phase.

(B) In a P – N – P common base amplifier input and output are out of phase.

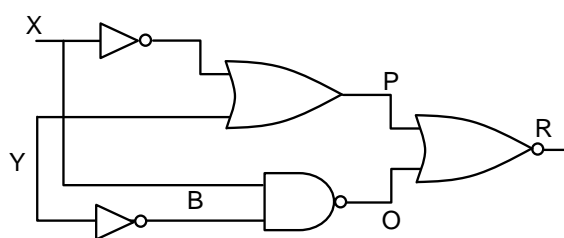
(C) In a N – P – N common base amplifier the input and output in a same phase.

(D) In a N – P – N common base amplifier input and output are out of phase.

5. **AC**

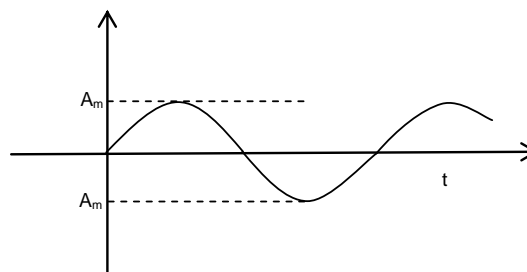
6. Given figure gives a system of logical gates. From the study of truth table it can be found that to produce a high output (1) at R, we must have:

- (A) $X = 0, Y = 1$
- (B) $X = 1, Y = 1$
- (C) $X = 1, Y = 0$
- (D) $X = 0, Y = 0$

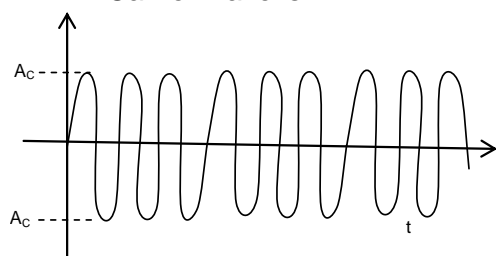


6. **C**

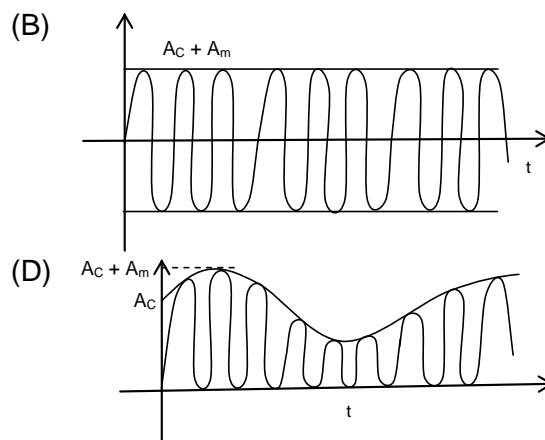
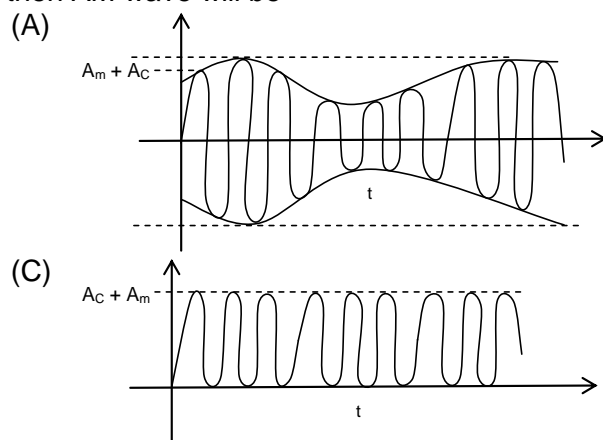
7. If message signal is



Carrier wave is



then AM wave will be



7. **A**

(Single Option Correct)

The following table has 3 columns and 4 rows. Based on table, there are THREE questions. Each question has FOUR option (A), (B), (C) and (D). ONLY ONE of these four options is correct.

Column 1	Column 2	Column 3
(I) $z = 3$	(i) 217.6 eV	(P) -108.8 eV
(II) $z = 2$	(ii) 122.4 eV	(Q) -27.2 eV
(III) $z = 1$	(iii) 54.4 eV	(R) -435.2 eV
(IV) $z = 4$	(iv) 13.6 eV	(S) -244.8 eV

8. The atomic number, kinetic energy and potential energy of electron of first orbit of Li^{2+} .

- (A) (IV) (iii) (R)
- (B) (I) (ii) (S)
- (C) (I) (ii) (R)
- (D) (I) (iii) (S)

8. **B**
9. The atomic number, magnitude of total energy and potential energy of electron of first orbit of He^+
 (A) (II) (iii) (P) (B) (II) (IV) (P)
 (C) (II) (ii) (P) (D) (I) (ii) (S)
9. **A**
10. The atomic number, kinetic energy and potential energy of an electron of first orbit of Be^{3+} .
 (A) (IV) (ii) (S) (B) (IV) (iii) (Q)
 (C) (IV) (i) (R) (D) (III) (ii) (P)
10. **C**

Two capacitors along with their values are given as

$$C_1 = (40 \pm 0.4) \mu\text{F}$$

$$C_2 = (80 \pm 1.2) \mu\text{F}$$

Column-1 lists four algebraic functions of C_1, C_2 ; column-2 lists corresponding percentage errors where as column-3 lists the absolute errors (given units).

Column 1	Column 2	Column 3
(I) $C_1 C_2$	(i) $\frac{4}{3}\%$	(P) 0.31
(II) $\frac{C_2}{C_1}$	(ii) $\frac{5}{2}\%$	(Q) 80
(III) $C_1 + C_2$	(iii) $\frac{7}{6}\%$	(R) 0.05
(IV) $\frac{C_1 C_2}{C_1 + C_2}$	(iv) $\frac{13}{2}\%$	(S) 1.6

11. Pick the correct option.
 (A) (IV) (iii) (P) (B) (II) (ii) (R)
 (C) (III) (i) (S) (D) (I) (iv) (Q)
11. **B**
12. Pick the correct option for series combination of C_1 and C_2 .
 (A) (IV) (iv) (Q) (B) (IV) (ii) (R)
 (C) (IV) (i) (S) (D) (IV) (iii) (P)
12. **D**
13. Pick the correct option for parallel combination of C_1 and C_2 .
 (A) (III) (iii) (P) (B) (III) (ii) (R)
 (C) (III) (i) (S) (D) (III) (iv) (Q)
13. **C**

PART – C (Integer Type)

This section contains 5 questions. The answer to each question is a **single-digit integer**, ranging from 0 to 9. The correct digit below the question number in the ORS is to be bubbled.

14. A particle of mass $3m$ at rest decays into two particles of masses m and $2m$ having non-zero velocities. The ratio of the de-Broglie wavelengths of first to second particle (λ_1/λ_2) is
14. **1**

15. The peak emission from a block body at a certain temperature occurs at a wavelength of 9000 \AA . On increasing its temperature, the total radiation emitted is increased to 81 times. At the initial temperature when the peak radiation from the black body is incident on a metal surface, it does not cause any photoemission from the surface. After the increase of temperature the peak radiation from the black body caused photoemission. To bring these photoelectrons to rest, a potential equivalent to the excitation energy between $n = 2$ to $n = 3$ Bohr levels of hydrogen atoms is required. If the work function of the metal is W then find the value of W (in eV)
15. **2.26**
16. An imaginary particle has a charge equal to that of an electron and mass 10 times the mass of the electron. It moves in a circular orbit around a nucleus of charge $(+4e)$. Take the mass of nucleus to be infinite. Assuming that the Bohr's model is applicable to this system. Find the wavelength of the radiation emitted, when the particle jumps from fourth orbit to the second orbit. (In \AA)
16. **30**
17. The unknown resistance in a meter bridge is given by $x = \left(\frac{l}{100-l} \right) R$ where l is the distance of null point from one end. Find the value of $\frac{1}{l}$ (in centimeter^{-1}) for which error in determination of x is minimum.
17. **0.02**
18. An experiment measures quantities a , b and c . x is calculated from $x = \frac{ab^2}{c^2}$. If the percentage errors in a , b , c are $\pm 1\%$, $\pm 3\%$ and $\pm 1\%$ respectively, the percentage error in x can be $\pm n\%$ then find the value of ' $n/2$ '.
18. **4.50**

pace for rough work

FIITJEE INTERNAL TEST

Batches:
RANK IMPROVEMENT TEST – X
IIT - JEE 2021

ANSWERS

QP CODE:

Answers

Chemistry

Part – A

Part – C

Mathematics

Part – A

Part – C

Physics

Part – A

Part – C