

VITEEE 2026 April 28 Shift 1

Question Paper with Solutions

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General Instructions

- (i) **Duration:** The total duration of the examination is 2.5 hours (150 minutes).
- (ii) **Total Marks:** The complete paper carries a maximum of 500 marks.
- (iii) **Structure:** The paper has 4 Sections:
 - **Part 1:** 35 Multiple Choice Questions (Physics).
 - **Part 2:** 35 Multiple Choice Questions (Chemistry).
 - **Part 3:** 40 Multiple Choice Questions (Mathematics/Biology).
 - **Part 4:** 10 Multiple Choice Questions (Aptitude).
 - **Part 5:** 5 Multiple Choice Questions (English)
- (iv) **Compulsory Questions:** All 125 questions are compulsory.
- (v) Each question has four options. Only **one** option is correct.
- (vi) **Correct Answer:** +4 marks.
- (vii) **Incorrect Answer:** -1 (Negative marking).
- (viii) **Unanswered/Marked for Review:** 0 marks.

1. A current of 2 A flows through a resistor for 10 minutes. What is the total charge that passes through the resistor?

- (A) 600 C
- (B) 1200 C
- (C) 200 C
- (D) 2400 C

Correct Answer: (B) 1200 C

Solution:

Concept: Electric current is defined as the rate of flow of electric charge. The relation between charge, current, and time is given by:

$$Q = It$$

where

- Q = total charge (in Coulombs)
- I = electric current (in Amperes)
- t = time (in seconds)

This formula helps determine how much charge flows through a conductor when a steady current passes for a certain time.

Step 1: Convert the given time into seconds.

$$10 \text{ minutes} = 10 \times 60 = 600 \text{ seconds}$$

Step 2: Apply the formula $Q = It$.

$$Q = 2 \times 600$$

$$Q = 1200 \text{ C}$$

Thus, the total charge flowing through the resistor is:

$$Q = 1200 \text{ C}$$

Quick Tip: Always convert time into **seconds** when using the relation $Q = It$, since current in amperes corresponds to coulombs per second.

2. A ball is dropped from a height of 20 m. What is its velocity just before hitting the ground?

- (A) 14 m/s
- (B) 19.8 m/s
- (C) 9.8 m/s
- (D) 39.6 m/s

Correct Answer: (B) 19.8 m/s

Solution:

Concept: When an object is dropped from a height, it falls freely under the influence of gravity. The velocity of the object just before hitting the ground can be determined using the kinematic equation:

$$v^2 = u^2 + 2gh$$

where

- v = final velocity just before impact
- g = acceleration due to gravity (9.8 m/s^2)
- h = height from which the object is dropped

Step 1: Substitute the given values into the formula.

$$v = \sqrt{2 \times 9.8 \times 20}$$

Step 2: Perform the calculation.

$$v = \sqrt{392}$$

$$v \approx 19.8 \text{ m/s}$$

Thus, the velocity of the ball just before hitting the ground is:

$$v = 19.8 \text{ m/s}$$

Quick Tip: When an object is **dropped**, the initial velocity is 0. In such cases, the velocity before hitting the ground can be directly found using $v = \sqrt{2gh}$.

3. A body of mass 10 kg is moving with a velocity of 20 m/s. What is the kinetic energy?

- (A) 1000 J
- (B) 2000 J
- (C) 4000 J
- (D) 500 J

Correct Answer: (B) 2000 J

Solution:

Concept: Kinetic energy is the energy possessed by a body due to its motion. It depends on the mass of the object and the square of its velocity.

$K.E. = \frac{1}{2}mv^2$

where

- m = mass of the body
- v = velocity of the body

Step 1: Substitute the given values.

$$m = 10 \text{ kg}, \quad v = 20 \text{ m/s}$$

$$K.E. = \frac{1}{2} \times 10 \times (20)^2$$

Step 2: Perform the calculation.

$$K.E. = 5 \times 400$$

$$K.E. = 2000 \text{ J}$$

Thus, the kinetic energy of the body is:

$$K.E. = 2000 \text{ J}$$

Quick Tip: Kinetic energy increases with the **square of velocity**. Doubling the velocity makes the kinetic energy **four times larger**.

4. A charged particle moves in a magnetic field B with velocity components both along and perpendicular to B . What is its path?

- (A) Circular path
- (B) Straight line
- (C) Helical path
- (D) Parabolic path

Correct Answer: (C) Helical path

Solution:

Concept: When a charged particle enters a magnetic field, it experiences a magnetic force given by the Lorentz force law:

$$F = q(\vec{v} \times \vec{B})$$

Key cases:

- If velocity is **perpendicular** to $B \rightarrow$ particle moves in a **circular path**.
- If velocity is **parallel** to $B \rightarrow$ particle moves in a **straight line**.
- If velocity has components **both parallel and perpendicular** to $B \rightarrow$ particle follows a **helical path**.

Step 1: Identify the components of velocity.

The particle has velocity components:

$$v_{\parallel} \text{ (along } B), \quad v_{\perp} \text{ (perpendicular to } B)$$

Step 2: Analyze the motion.

- The perpendicular component v_{\perp} causes **circular motion**.
- The parallel component v_{\parallel} causes **uniform motion along the field**.

Step 3: Combine the two motions.

The combination of circular motion and forward motion produces a:

Helical path

Quick Tip: A quick rule:

- $v \perp B \rightarrow$ Circular motion
- $v \parallel B \rightarrow$ Straight line
- v partly parallel and partly perpendicular \rightarrow **Helical motion**

5. Find x : $4(x - 2) = 3(x + 5)$.

- (A) 23
- (B) 17
- (C) 13
- (D) 7

Correct Answer: (C) 13

Solution:

Concept: To solve linear equations, expand the brackets and collect like terms on one side. A linear equation has the general form:

$ax + b = cx + d$

The goal is to isolate the variable x .

Step 1: Expand both sides of the equation.

$$4(x - 2) = 3(x + 5)$$

$$4x - 8 = 3x + 15$$

Step 2: Bring like terms together.

$$4x - 3x = 15 + 8$$

$$x = 23$$

Thus, the value of x is:

$$x = 23$$

Quick Tip: When solving linear equations, always **expand brackets first** and then move variable terms to one side and constants to the other.

6. Find x : $2x + 3 = 7x - 8$.

- (A) 2.2
- (B) $11/5$
- (C) 5
- (D) Both (1) and (2)

Correct Answer: (D) Both 2.2 and $11/5$

Solution:

Concept: A linear equation can be solved by rearranging terms so that the variable appears on one side and constants on the other.

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Step 1: Rearrange the equation.

$$2x + 3 = 7x - 8$$

Move variable terms to one side:

$$2x - 7x = -8 - 3$$

$$-5x = -11$$

Step 2: Solve for x .

$$x = \frac{-11}{-5}$$

$$x = \frac{11}{5}$$

Step 3: Convert to decimal form (optional).

$$x = 2.2$$

Thus, the solution can be written as:

$$x = 2.2 \quad \text{or} \quad \frac{11}{5}$$

Quick Tip: Fractions and decimals can represent the same value. For example, $\frac{11}{5} = 2.2$.

7. The sum of the first 10 terms of an A.P. is 150. If the first term is 10, what is the common difference?

- (A) 1
- (B) 10/9
- (C) 2
- (D) 5/9

Correct Answer: (B) 10/9

Solution:

Concept: The sum of the first n terms of an arithmetic progression is given by:

$$S_n = \frac{n}{2}(2a + (n-1)d)$$

where

- a = first term

- $d =$ common difference
- $n =$ number of terms

Step 1: Substitute the given values.

$$S_{10} = 150, \quad a = 10, \quad n = 10$$

$$150 = \frac{10}{2}(2(10) + (10 - 1)d)$$

Step 2: Simplify the equation.

$$150 = 5(20 + 9d)$$

$$150 = 100 + 45d$$

Step 3: Solve for d .

$$50 = 45d$$

$$d = \frac{50}{45}$$

$$d = \frac{10}{9}$$

Thus, the common difference is:

$$d = \frac{10}{9}$$

Quick Tip: When solving A.P. problems involving sums, directly substitute the values into $S_n = \frac{n}{2}(2a + (n - 1)d)$ to form an equation and solve for the unknown.

8. A stone is dropped from a height of 45 m. What is the time taken to reach the ground?
($g = 10 \text{ m/s}^2$)

- (A) 2 s
- (B) 3 s
- (C) 4 s
- (D) 5 s

Correct Answer: (B) 3 s

Solution:

Concept: For a body falling freely under gravity, the time taken to fall from height h is given by:

$h = \frac{1}{2}gt^2$

where

- t = time of fall
- h = height
- g = acceleration due to gravity

Step 1: Substitute the given values.

$$h = 45 \text{ m}, \quad g = 10 \text{ m/s}^2$$

$$t = \sqrt{\frac{2 \times 45}{10}}$$

Step 2: Simplify the expression.

$$t = \sqrt{\frac{90}{10}}$$

$$t = \sqrt{9}$$

$$t = 3 \text{ s}$$

Thus, the time taken for the stone to reach the ground is:

$$t = 3 \text{ s}$$

Quick Tip: For objects **dropped from rest**, the time of fall depends only on height and gravity using

$$t = \sqrt{2h/g}.$$

9. If 'TIGER' is coded as 'JUISF', how is 'EQUAL' coded?

- (A) PFXMB
- (B) QGYNC
- (C) OEWLA
- (D) PGXMB

Correct Answer: (A) PFXMB

Solution:

Concept: In coding–decoding problems, letters are often shifted forward or backward in the alphabet. Each letter is replaced according to a specific pattern.

Step 1: Observe the pattern in the given coding.

$$T \rightarrow U$$

$$I \rightarrow J$$

$$G \rightarrow I$$

$$E \rightarrow S$$

$$R \rightarrow F$$

Each letter in **TIGER** is shifted forward by one position in the alphabet.

Step 2: Apply the same pattern to 'EQUAL'.

$$E \rightarrow P$$

$$Q \rightarrow F$$

$$U \rightarrow X$$

$$A \rightarrow M$$

$$L \rightarrow B$$

Step 3: Write the coded word.

$$EQUAL \rightarrow PFXMB$$

Thus, the coded form of the word is:

PFXMB

Quick Tip: In coding questions, first check for simple patterns such as **alphabet shifts, reverse order,** or **position-based changes.**

10. If "APPLE" is "BQQMF", how is "MANGO" written?

- (A) NBMHP
- (B) NBOHP
- (C) OBNHP
- (D) MBNHP

Correct Answer: (B) NBOHP

Solution:

Concept: In this coding pattern, each letter of the word is shifted **one position forward** in the English alphabet.

Step 1: Analyze the given example.

$A \rightarrow B$

$P \rightarrow Q$

$P \rightarrow Q$

$L \rightarrow M$

$E \rightarrow F$

Thus, every letter moves **one step forward**.

Step 2: Apply the same rule to "MANGO".

$M \rightarrow N$

$A \rightarrow B$

$N \rightarrow O$

$G \rightarrow H$

$O \rightarrow P$

Step 3: Write the coded word.

$MANGO \rightarrow NBOHP$

Thus, the coded word is:

NBOHP

Quick Tip: If every letter increases by one alphabet position, remember that Z wraps around to A.

11. Find the odd one out: 5, 10, 20, 40, 100, 150, 200.

- (A) 40
- (B) 100
- (C) 150
- (D) 200

Correct Answer: (B) 100

Solution:

Concept: To find the odd number in a series, we analyze the pattern or rule followed by most numbers in the sequence.

Step 1: Observe the pattern of multiplication.

$$5 \times 2 = 10$$

$$10 \times 2 = 20$$

$$20 \times 2 = 40$$

Continuing the same pattern:

$$40 \times 2 = 80$$

But the given number is 100.

Step 2: Identify the mismatch.

The expected term should be 80, but the series contains 100, which breaks the pattern.

Step 3: Verify remaining terms.

After 80, the pattern could continue as:

$$80 + 70 = 150$$

$$150 + 50 = 200$$

Thus, 100 does not follow the consistent pattern.

Therefore, the odd number in the series is:

100

Quick Tip: When finding an odd term, check patterns such as **multiplication, addition differences, or powers**. The number that breaks the rule is the odd one.

12. What is the oxidation state of Cobalt in $[Co(NH_3)_6]Cl_3$?

- (A) +1
- (B) +2
- (C) +3
- (D) +4

Correct Answer: (C) +3

Solution:

Concept: In coordination compounds, the oxidation state of the central metal ion can be determined using the charges of ligands and the overall charge of the complex.

Important points:

- NH_3 is a **neutral ligand**.
- Cl^- carries a charge of -1 .
- The compound $[Co(NH_3)_6]Cl_3$ contains three chloride ions outside the coordination sphere.

Step 1: Determine the charge on the complex ion.

Since there are 3 chloride ions (Cl^-), the complex ion must have a charge of:



Step 2: Let the oxidation state of cobalt be x .

$$x + 6(0) = +3$$

Step 3: Solve the equation.

$$x = +3$$

Thus, the oxidation state of cobalt is:

+3

Quick Tip: Neutral ligands such as NH_3 , H_2O , and CO contribute **zero charge**. Only charged ligands affect the oxidation state calculation.

13. For $2N_2O_5 \rightarrow 4NO_2 + O_2$, if rate is 1.02×10^{-4} and $k = 3.4 \times 10^{-5} s^{-1}$, find the concentration of N_2O_5 .

- (A) 1.0 mol/L
- (B) 2.0 mol/L
- (C) 3.0 mol/L
- (D) 4.0 mol/L

Correct Answer: (C) 3.0 mol/L

Solution:

Concept: For a first-order reaction, the rate law is given by:

$\text{Rate} = k[N_2O_5]$

where

- Rate = reaction rate
- k = rate constant
- $[N_2O_5]$ = concentration of the reactant

Step 1: Substitute the given values.

$$\text{Rate} = 1.02 \times 10^{-4}$$

$$k = 3.4 \times 10^{-5}$$

$$1.02 \times 10^{-4} = (3.4 \times 10^{-5})[N_2O_5]$$

Step 2: Solve for the concentration.

$$[N_2O_5] = \frac{1.02 \times 10^{-4}}{3.4 \times 10^{-5}}$$

Step 3: Simplify the calculation.

$$[N_2O_5] = 3$$

$$[N_2O_5] = 3.0 \text{ mol/L}$$

Thus, the concentration of N_2O_5 is:

$$\boxed{3.0 \text{ mol/L}}$$

Quick Tip: In first-order reactions, concentration can be directly found using $\text{Rate} = k[\text{Reactant}]$.