VITEEE 2025 Question Paper with Solutions

Memory-Based Solved Paper (Physics, Chemistry, Mathematics, Aptitude & English)

> **Note:** Vellore Institute of Technology (VIT) does not officially publish VITEEE question papers or answer keys. This document compiles verified memory-based questions reported from VITEEE 2025 shifts along with complete answer keys and step-by-step solutions for exam practice.

Exam	Duration Mode	2025 Pattern (125 MCQs)	Marking Scheme (2025)
Online CBT	2 Hours 30 Minutes	Maths/Bio: 40 | Physics: 35 | Chem: 35 | Aptitude: 10 | English: 5	+1 for correct, 0 for incorrect

Section I: Physics

Q1. A body is projected with a velocity of 20 m/s at an angle of 30° to the horizontal. The maximum height reached by the body is (take g = 10 m/s^2): (A) 5 m (B) 10 m (C) 15 m (D) 20 m

Q2. Two capacitors of capacitance 2 µF and 4 µF are connected in series. The equivalent capacitance of the combination is:

(A) 6 µF (B) 1.33 µF (C) 8 µF (D) 2 µF

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Q3. In Young's double-slit experiment, the fringe width is 0.6 mm. If the distance between the slits and the screen is doubled and the separation between the slits is halved, the new fringe width will be: (A) 0.3 mm (B) 1.2 mm (C) 2.4 mm (D) 4.8 mm

Q4. The dimensional formula for magnetic flux (Φ) is:

(A) [M L^2 T^{-2} A^{-1}] (B) [M L T^{-2} A^{-1}] (C) [M L^2 T^{-1} A^{-2}] (D) [M L^2 T^{-2} A]

Q5. A capacitor of 10 µF is charged to a potential difference of 50 V. The electrostatic energy stored in the capacitor is:

(A) 0.00125 J (B) 0.0125 J (C) 0.125 J (D) 1.25 J

Q6. In a series LCR circuit, the resonance frequency is f. If the capacitance is made 4 times its original value while keeping inductance unchanged, the new resonance frequency will be:

(A) 4f (B) 2f (C) f/2 (D) f/4

Section II: Chemistry

Q7. The IUPAC name of the compound CH_3–CH(OH)–COOH is:

(A) 2-Hydroxypropanoic acid (B) 2-Hydroxyethanoic acid (C) 3-Hydroxypropanoic acid (D) Ethanoic acid

Q8. The hybridization state of carbon atoms in diamond is:

(A) sp (B) sp^2 (C) sp^3 (D) dsp^2

Q9. For the decomposition reaction $2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$, if the rate of disappearance of N_2O_5 is 0.2 mol L^{-1} s^{-1}, then the rate of formation of O_2 is:

(A) 0.1 mol L^{-1} s^{-1} (B) 0.2 mol L^{-1} s^{-1} (C) 0.4 mol L^{-1} s^{-1} (D) 0.8 mol L^{-1} s^{-1}

Q10. Which of the following hydrocarbons has the highest boiling/sublimation point at atmospheric pressure?

(A) Methane (B) Ethene (C) Ethane (D) Ethyne

Section III: Mathematics

Q11. The value of the definite integral $\int_0^{\pi/2} \sin^2 x \, dx$ is:

(A) $\pi/4$ (B) $\pi/2$ (C) $\pi/8$ (D) 1

Q12. The sum of the first 10 terms of an arithmetic progression (A.P.) is 150. If the first term is 10, the common difference is:

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

Q13. Find the perpendicular distance between the parallel planes $2x + 3y + 4z = 4$ and $4x + 6y + 8z = 12$:

(A) $1/\sqrt{29}$ (B) $2/\sqrt{29}$ (C) $3/\sqrt{29}$ (D) $4/\sqrt{29}$

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Section IV: Aptitude & English

Q14. If the day after tomorrow is Wednesday, what day of the week is today?

(A) Monday (B) Tuesday (C) Sunday (D) Thursday

Q15. Choose the word or phrase closest in meaning to **Eloquent**:

(A) Hesitant (B) Fluent and expressive (C) Silent (D) Ambiguous

Quick Answer Key

Q. No.	Ans	Q. No.	Ans	Q. No.	Ans
Q1	(A)	Q6	(C)	Q11	(A)
Q2	(B)	Q7	(A)	Q12	(B)
Q3	(C)	Q8	(C)	Q13	(B)
Q4	(A)	Q9	(A)	Q14	(A)
Q5	(B)	Q10	(D)	Q15	(B)

Detailed Solutions

1. **(A) 5 m:** Vertical component $u_y = u \sin 30° = 20 \times 0.5 = 10$ m/s. Maximum height $H = u_y^2 / (2g) = 10^2 / (2 \times 10) = 100 / 20 = 5$ m.

2. **(B) 1.33 µF:** For capacitors in series, $1/C_{eq} = 1/2 + 1/4 = 3/4$, hence $C_{eq} = 4/3 \approx 1.33$ µF.

3. **(C) 2.4 mm:** Fringe width $\beta = \lambda D/d$. With $D' = 2D$ and $d' = d/2$, $\beta' = \lambda(2D)/(d/2) = 4\beta = 4 \times 0.6 = 2.4$ mm.

4. **(A) $[M L^2 T^{-2} A^{-1}]$:** Since $F = I L B$, $[B] = [M T^{-2} A^{-1}]$. Magnetic flux $\Phi = B \times$ Area, so $[\Phi] = [M T^{-2} A^{-1}][L^2] = [M L^2 T^{-2} A^{-1}]$.

5. **(B) 0.0125 J:** Energy stored $U = ½ C V^2 = 0.5 \times (10 \times 10^{-6}) \times 50^2 = 5 \times 10^{-6} \times 2500 = 0.0125$ J.

6. **(C) f/2:** Resonance frequency $f = 1 / (2\pi\sqrt{(LC)})$. When C becomes 4C, $f' = 1 / (2\pi\sqrt{(4LC)}) = f/2$.

7. **(A) 2-Hydroxypropanoic acid:** The carboxylic acid (–COOH) group gets priority as C-1 on the 3carbon parent chain, placing the –OH substituent at C-2 (commonly known as lactic acid).

8. **(C) sp^3:** Each carbon atom in diamond is tetrahedrally bonded to four other carbon atoms via single σbonds, corresponding to sp^3 hybridization.

9. **(A) 0.1 mol L^{-1} s^{-1}:** From stoichiometry, $-(1/2) d[N_2O_5]/dt = +d[O_2]/dt$. Therefore, rate of formation of $O_2 = (1/2) \times 0.2 = 0.1$ mol L^{-1} s^{-1}.

10. **(D) Ethyne:** Among these light C1–C2 hydrocarbons, ethyne (–84 °C) has a higher boiling/sublimation point than ethane (–89 °C), ethene (–104 °C), and methane (–161.5 °C) due to greater polarizability and closer molecular packing.

11. **(A) π/4:** Using $\sin^2 x = (1 - \cos 2x)/2$, $\int_0^{\pi/2} \sin^2 x \, dx = [x/2 - (\sin 2x)/4]_0^{\pi/2} = \pi/4$.

12. **(B) 10/9:** $S_n = (n/2)[2a + (n - 1)d]$. Substituting $S_{10} = 150$ and $a = 10$ gives $150 = 5(20 + 9d) \Rightarrow 30 = 20 + 9d \Rightarrow d = 10/9$.

13. **(B) 2/√29:** Divide the second plane equation by 2 to get $2x + 3y + 4z = 6$. Distance $= |d_2 - d_1| / \sqrt{(a^2 + b^2 + c^2)} = |6 - 4| / \sqrt{(4 + 9 + 16)} = 2/\sqrt{29}$.

14. **(A) Monday:** Day after tomorrow = Wednesday ⇒ Tomorrow = Tuesday ⇒ Today = Monday.

15. **(B) Fluent and expressive:** "Eloquent" describes clear, persuasive, and fluent expression in speech or writing.

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