Interactive Practice & Step-by-Step Solutions: Practice chapter-wise PYQs with timer & full explanation on The Crucible.

Open on The Crucible ↗

Alternating Current — Alternating Current, Voltage and Power · VITEEE 2023 Practice on Crucible ↗

1. The current i passed in any instrument in an A.C. circuit is i = 2sinωt amp and potential difference applied is given by V = 5cosωt volt. Power loss in the instrument is:

(A) 10 watt **(B)** 5 watt

(C) zero watt **(D)** 20 watt

Atomic Physics — Bohr's Atomic Model · VITEEE 2022 Practice on Crucible ↗

2. What is the ground state energy of positronium? (The ground state energy of hydrogen is −13.6eV)

(A) −3.4eV **(B)** −6.8eV

(C) −13.6eV **(D)** −27.2eV

Dual Nature of Matter — Photoelectric Effect · VITEEE 2021 Practice on Crucible ↗

3. Photoelectric work function of a metal is 1eV. Light of wavelength λ = 3000Å falls on it. The photo electrons come out with a maximum velocity of :

(A) 10 metres/sec **(B)** 102 metres /sec

(C) 104 metres /sec **(D)** 106 metres /sec

Electromagnetic Induction — LR Circuit · VITEEE 2022 Practice on Crucible ↗

4. A coil of 40 henry inductance is connected in series with a resistance of 8ohm and the combination is joined to the terminals of a 2 volt battery. The time constant of the circuit is

(A) 20 seconds **(B)** 5 seconds

(C) 1/5 seconds **(D)** 40 seconds

Electromagnetic Waves — Properties of X-Rays · VITEEE 2022 Practice on Crucible ↗

5. The glancing angle in a X-rays diffraction experiment is 30 ◦ and the wavelength of the X rays used is 20 mm. The interplanar spacing of the crystal diffracting these X-rays will be

(A) 40 nm **(B)** 20 nm

(C) 15 nm **(D)** 10 nm

Electrostatics — Electric Dipole · VITEEE 2019 Practice on Crucible ↗

6. An electric dipole is kept in a uniform electric field. It experiences

(A) a force and a torque
(B) a force, but no torque
(C) a torque but no net force
(D) neither a force nor a torque,

Magnetic Effects of Current — Magnetic Field · VITEEE 2021 Practice on Crucible ↗

7. A straight section PQ of a circuit lies along the X-axis from x = – a 2 to x = a 2 and carries a steady current i. The magnetic field due to the section PQ at a point X = + a will be

(A) proportional to a
(B) proportional to a2
(C) proportional to 1/a
(D) zero

Magnetic Properties of Matter — Magnetic Flux · VITEEE 2019 Practice on Crucible ↗

8. A metal ring is held horizontally and bar magnet is dropped through the ring with its length along the axis of the ring. The acceleration of the falling magnet

(A) is equal to g
(B) is less than g
(C) is more than g
(D) depends on the diameter of ring and length of magnet

Motion In Two Dimensions — Range of Projectile · VITEEE 2021 Practice on Crucible ↗

9. Two bodies of same mass are projected with the same velocity at an angle 30 ◦ and 60 ◦ respectively. The ratio of their horizontal ranges will be

(A) 1: 1
(B) 1: 2
(C) 1: 3
(D) 2:√2

Nuclear Physics — Half life time · VITEEE 2019 Practice on Crucible ↗

10. The half-life period and the mean life period of a radioactive element are denoted respectively by Th and Tm. Then

(A) Th = Tm
(B) Th > Tm
(C) Th < Tm
(D) Th ≥Tm

Aldehydes and Ketones — Iodoform test · VITEEE 2019 Practice on Crucible ↗

11. An organic compound 'A' has the molecular formula C3H6O, it undergoes iodoform test. When saturated with dil. HCl it gives ' B ' of molecular formula C9H14O. A and B respectively are

(A) Propanal and mesitylene
(B) Propanone and mesityl oxide
(C) Propanone and 2,6-dimethyl-2, 5 -heptadien-4-one
(D) Propanone and mesitylene oxide

Amines — Reduction of Nitro compounds · VITEEE 2022 Practice on Crucible ↗

12. In the given reaction, X-stands for

(A) –NH2
(B) SnCl2
(C) –Cl
(D) –NH3 +Cl –

Chemical Kinetics — Integrated rate laws · VITEEE 2021 Practice on Crucible ↗

13. The half-life of a reaction is inversely proportional to the square of the initial concentration of the reactant. Then the order of the reaction is [ ] ( )

(A) 0
(B) 1
(C) 2
(D) 3

Electrochemistry — Electrode potential · VITEEE 2019 Practice on Crucible ↗

14. The electrode potentials for Cu2 +(aq) + e −⟶Cu +(aq) and Cu +(aq) + e −⟶Cu(s) are +0.15 V and +0.50 V, respectively. The value of E ◦ Cu2 + /Cu will be:

(A) 0.500 V
(B) 0.325 V
(C) 0.650 V
(D) 0.150 V

General Organic Chemistry — Conformational isomerism · VITEEE 2021 Practice on Crucible ↗

15. In the following skew conformation of ethane, H′ –C –C –H′′ dihedral angle is :

(A) 58 ◦
(B) 149 ◦
(C) 151 ◦
(D) 120 ◦

Hydrocarbons — Anti Markovnikov addition · VITEEE 2021 Practice on Crucible ↗

16. Which of the following compounds does not follow Markownikoff's law?

(A) CH3CH = CH2
(B) CH2CHCl
(C) CH3CH = CHCH3
(D) None

Hydrogen — Atomic hydrogen · VITEEE 2019 Practice on Crucible ↗

17. In a hydrogen - oxygen fuel cell, combustion of hydrogen occurs to:

(A) Produce high purity water
(B) Create potential difference between the two electrodes
(C) Generate heat
(D) Remove adsorbed oxygen from electrode surfaces

Solid State — Rock salt structure · VITEEE 2022 Practice on Crucible ↗

18. In the solid state, MgO has the same structure as that of sodium chloride. The number of oxygens surrounding each magnesium in MgO is ( ) ( )

(A) 6
(B) 1
(C) 2
(D) 4

Solutions — Characteristics of solution · VITEEE 2019 Practice on Crucible ↗

19. Deep sea divers used to respirate a mixture of

(A) Oxygen and argon
(B) Oxygen and helium
(C) Oxygen and nitrogen
(D) Oxygen and hydrogen

Structure of Atom — Atomic number · VITEEE 2021 Practice on Crucible ↗

20. The increasing order for the values of e/m (charge/mass) is

(A) e, p, n, α
(B) n, p, e, α
(C) n, p, α, e
(D) n, α, p, e

Application of Derivatives — Monotonicity · VITEEE 2019 Practice on Crucible ↗

21. If f(x) = x3 + bx2 + cx + d and 0 < b2 < c, then in (−∞, ∞)

(A) f(x) is a strictly increasing function
(B) f(x) has local maxima
(C) f(x) is a strictly decreasing function
(D) f(x) is bounded

Circle — questions on standard form · VITEEE 2019 Practice on Crucible ↗

22. If the coordinates at one end of a diameter of the circle x2 + y2 −8x −4y + c = 0 are (−3, 2), then the coordinates at the other end are

(A) (5, 3)
(B) (6, 2)
(C) (1, −8)
(D) (11, 2)

Complex Number — Cube Root of Unity · VITEEE 2019 Practice on Crucible ↗

23. If ω = −1 +√3i 2 then 3 + ω + 3ω2 4 is

(A) 16
(B) −16
(C) 16ω
(D) 16ω2

Continuity and Differentiability — Differentiability · VITEEE 2021 Practice on Crucible ↗

24. If f(x) = x + x 1 + x + x (1 + x)2 + … to ∞, then at x = 0, f(x)

(A) has no limit
(B) is discontinuous
(C) is continuous but not differentiable
(D) is differentiable

Determinants — System of Linear Equations · VITEEE 2019 Practice on Crucible ↗

25. The system of linear equations : x + y + z = 0, 2x +y −z = 0, 3x + 2y = 0 has :

(A) no solution
(B) a unique solution
(C) an infinitely many solution
(D) None of these

Indefinite Integration — miscellaneous forms · VITEEE 2021 Practice on Crucible ↗

26. Let $\int x1 / 2 \sqrt{1} - x3dx = 2\ 3gof(x) + C$, then

(A) $f(x) = \sqrt{x}$
(B) $f(x) = x3 / 2$ and $g(x) = \sin -1x$
(C) $f(x) = x2 / 3$
(D) None of these

Mathematical Induction — Mathematical Induction · VITEEE 2023 Practice on Crucible ↗

27. If $(G, *)$ is a group such that $(a * b)2 = (a * a) * b * b$) for all a, b, $\in G$, then G is

(A) abelian
(B) finite
(C) infinite
(D) None

Mathematical Reasoning — Mathematical Reasoning · VITEEE 2019 Practice on Crucible ↗

28. The inverse of the statement $(p \wedge \sim q) \rightarrow r$ is

(A) $\sim(p \vee \sim q) \rightarrow \sim r$
(B) $(\sim p \wedge q) \rightarrow \sim r$
(C) $(\sim p \vee q) \rightarrow \sim r$
(D) None of these

Permutation Combination — Factorial Based Questions · VITEEE 2023 Practice on Crucible ↗

29. If $nPr = nPr + 1$ and $nCr = nCr - 1$, then the values of n and r are

(A) 4,3
(B) 3,2
(C) 4,2
(D) None of these

Sets and Relations — Questions on number of relations and sets · VITEEE 2021 Practice on Crucible ↗

30. Which one of the following is an infinite set ?

(A) The set of human beings on the earth
(B) The set of water drops in a glass of water
(C) The set of trees in a forest
(D) The set of all primes

Answer Key (Q1 to Q30)

Click any question number below to practice chapter-wise PYQs on The Crucible ↗

1: (A)	2: (B)	3: (D)	4: (B)	5: (B)	6: (C)	7: (D)	8: (B)	9: (A)	10: (C)
11: (C)	12: (A)	13: (D)	14: (B)	15: (B)	16: (C)	17: (B)	18: (A)	19: (B)	20: (D)
21: (A)	22: (D)	23: (C)	24: (B)	25: (C)	26: (B)	27: (A)	28: (C)	29: (B)	30: (D)

Sample Solution — Question 1 (VITEEE 2023 · Correct Option: A)

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Q1. The current i passed in any instrument in an A.C. circuit is i = 2sinωt amp and potential difference applied is given by V = 5cosωt volt. Power loss in the instrument is:

i = 2sinωt V = 5cosωt I(max) = 2amp, V = 5 V P = VI = 5 × 2 = 10 watt.

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