SET-I

Shivaji University, Kolhapur

Ph.D. Entrance Examination-[redacted]

PHYSICS

Answer key

1. (c) r^{-5}
2. (b) $25000\ km$
3. (c) $V_g V_p = c^2$
4. (a) it would have violate Maxwell equation, $\vec{\nabla}.\vec{B} = 0$
5. (c) on $p\ sin\,(\theta/2)$
6. (d) 4
7. (c) 2
8. (a) $1/18$
9. (c) $-\frac{3}{16}$ and $\frac{3}{16}$
10. (a) $6\ GeV/c^2$
11. (b) With increase in temperature, the critical magnetic field decreases linearly to zero.
12. (a) $R = \frac{mL}{ne^2 A\tau}$
13. (d) The operators have diagonalizable commuting matrices
14. (b) Exponentially decreasing
15. (c) $1/2$
16. (a) 0
17. (c) Truncated octahedron
18. (d) All conservations hold true; the reaction is allowed
19. (d) All the above
20. (c) $1.25\ R$
21. (c) 1
22. (c) 6
23. (b) $\frac{\partial I_D}{\partial V_{GS}}$ at constant V_{DS}
24. (c) $(A_1 + A_2)^2$
25. (c) $5/3$
26. (c) Carrier concentration and mobility
27. (d) Inelastic scattering of photons

28. (b) It uses a brighter, more coherent electron source, leading to higher resolution.
29. (c) Provide continuous observation of the Sun
30. (a) The error resulting from representing a number with a finite number of digits
31. (a) Molar absorptivity, concentration, and path length
32. (d) To convert light pulses from the scintillator into an electrical signal and amplify it
33. (d) An endothermic reaction, such as decomposition or dehydration
34. (b) It has a very slow scanning speed, limiting its use for dynamic processes
35. (c) Electronic transitions
36. (b) Determining molecular rotation and electron spin resonance (ESR)
37. (b) To ensure that a random orientation of crystallites is exposed to the X-ray beam
38. (b) Providing a strong, monochromatic light source for scattering
39. (b) The power radiated in a specific direction compared to an isotropic source
40. (d) SILAR
41. (c) Hydrothermal synthesis
42. (d) Proton precession magnetometer
43. (c) Intermediate Frequency
44. (c) Dip coating
45. (d) All the above
46. (d) 4 Angstrom
47. (b) Experimental Research
48. (d) Giving credit to the original author for their ideas and words
49. (d) To ensure all citations are formatted in a consistent way
50. (a) A topic is a broad area of interest, while a hypothesis is a specific, testable statement.

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