



CUET PG Forensic Science Practice Test 13 PDF

TOPIC -> BASIC PHYSICS (50 M.C.Q)

Q1. A material shows negative refractive index when simultaneously:

- A) $\epsilon > 0, \mu > 0$
- B) $\epsilon < 0, \mu > 0$
- C) $\epsilon > 0, \mu < 0$
- D) $\epsilon < 0, \mu < 0$

Q2. Dimensional formula of refractive index gradient is:

- A) L^{-1}
- B) L
- C) T^{-1}
- D) Dimensionless

Q3. A body moves in inverse-cube central force. The orbit is:

- A) Circle
- B) Ellipse
- C) Logarithmic spiral
- D) Hyperbola

Q4. In uniform gravitational field, trajectory minimizing time between two points is:

- A) Straight line
- B) Cycloid
- C) Parabola
- D) Catenary

Q5. Centripetal acceleration (a_c) of a particle in motion becomes zero when:

- A) The particle comes to rest ($v=0$)
- B) The radius of curvature becomes infinite ($r \rightarrow \infty$)
- C) The angular velocity is constant
- D) Both A and B are technically correct

Q6. Weight of body at Earth's center is:

- A) Maximum
- B) Half
- C) Zero
- D) Infinite

Q7. Density variation with temperature for ideal gas at constant pressure is:

- A) $\propto T$
- B) $\propto 1/T$
- C) $\propto T^2$
- D) Constant

Q8. Rayleigh criterion resolution depends on:

- A) Wavelength only
- B) Aperture only
- C) λ/NA
- D) Intensity

Q9. Numerical aperture increases when:

- A) Refractive index of medium increases
- B) Focal length increases
- C) Wavelength increases
- D) Slit width decreases

Q10. Two-slit interference disappears if slits are illuminated by:

- A) Monochromatic coherent light
- B) Incoherent sources
- C) Laser
- D) Same phase waves

Q11. Michelson interferometer fringe shift of one fringe equals mirror displacement:

- A) $\lambda/4$
- B) $\lambda/2$
- C) λ
- D) 2λ

Q12. Brewster angle exists only when reflected light is:

- A) Circularly polarized
- B) Elliptically polarized
- C) Completely polarized
- D) Random

Q13. Degree of polarization is measured using:

- A) Interferometer
- B) Analyzer rotation
- C) Spectrometer
- D) Diffraction grating

Q14. Diffraction dominates when aperture size is:

- A) $\gg \lambda$
- B) $\approx \lambda$
- C) $\ll \lambda$
- D) Independent of λ

Q15. Fraunhofer diffraction requires source and screen at:

- A) Finite distance
- B) Infinite distance or lens focus
- C) Same plane
- D) Node points

Q16. Resolving power of microscope \propto

- A) NA
- B) $1/NA$
- C) NA^2
- D) λ^2

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Q17. Limit of resolution improves when:

- A) λ increases
- B) NA decreases
- C) Immersion oil used
- D) Aperture closed

Q18. Electron microscope resolution limited mainly by:

- A) Lens aberration
- B) Wavelength
- C) Voltage fluctuation
- D) Brightness

Q19. Stereoscopic microscope gives depth due to:

- A) Polarization
- B) Two optical paths
- C) Diffraction
- D) Fluorescence

Q20. Fluorescence microscopy uses excitation at:

- A) Longer wavelength
- B) Same wavelength
- C) Shorter wavelength
- D) Infrared

Q21. Superposition principle fails when medium is:

- A) Linear
- B) Nonlinear
- C) Homogeneous
- D) Isotropic

Q22. Phase difference π produces:

- A) Bright fringe
- B) Dark fringe
- C) No fringe
- D) Random

Q23. Optical path length =

- A) $n \times \text{distance}$
- B) $\text{distance}/n$
- C) $n^2 \times \text{distance}$
- D) $\text{distance}^2/n$

Q24. In central force motion angular momentum is:

- A) Zero
- B) Variable
- C) Conserved
- D) Infinite

Q25. Effective potential includes:

- A) Only $V(r)$
- B) Only kinetic energy
- C) $V(r) + L^2/2mr^2$
- D) Only centripetal term

Q26. Polarization by reflection maximum at:

- A) Critical angle
- B) Brewster angle
- C) 45° always
- D) 90°

Q27. Malus law intensity \propto

- A) $\sin\theta$
- B) $\cos\theta$
- C) $\cos^2\theta$
- D) $\tan^2\theta$

Q28. Diffraction grating principal maxima condition:

- A) $d \sin\theta = n\lambda$
- B) $a \sin\theta = n\lambda$
- C) $2d \sin\theta = n\lambda$
- D) $\lambda = d/n$

Q29. Fringe visibility decreases when:

- A) Equal intensity
- B) Unequal intensity
- C) Coherent sources
- D) Narrow slit

Q30. Compound microscope total magnification =

- A) f_o/f_e
- B) $(L/f_o)(D/f_e)$
- C) f_e/f_o
- D) L/D

Q31. Comparison microscope used in:

- A) Astronomy
- B) Ballistics
- C) Spectroscopy
- D) Polarimetry

Q32. Electron wavelength decreases with:

- A) Higher accelerating voltage
- B) Lower voltage
- C) Higher mass
- D) Lower charge

Q33. Refractive index < 1 possible in:

- A) Vacuum
- B) Metamaterials
- C) Glass
- D) Water

Q34. Group velocity equals phase velocity when:

- A) Dispersive medium
- B) Non-dispersive medium
- C) Absorbing medium
- D) Anisotropic medium

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Q35. Optical anisotropy causes:

- A) Reflection
- B) Refraction
- C) Double refraction
- D) Diffraction

Q36. Extraordinary ray in crystal obeys:

- A) Snell law always
- B) Modified Snell law
- C) No refraction
- D) Only reflection

Q37. The Critical angle (θ_c) for total internal reflection increases when:

- A) The refractive index of the denser medium (n_1) decreases
- B) The refractive index of the rarer medium (n_2) decreases
- C) The ratio n_1/n_2 increases
- D) The wavelength of light decreases

Q38. Airy disk radius \propto

- A) λ/D
- B) D/λ
- C) λ^2
- D) $1/D^2$

Q39. Motion under inverse square force conserves:

- A) Energy only
- B) Angular momentum only
- C) Runge-Lenz vector
- D) None

Q40. Spiral orbit occurs when force \propto

- A) $1/r^2$.
- B) r
- C) $1/r^3$.
- D) Constant

Q41. Mass vs weight difference due to:

- A) Location
- B) Temperature
- C) Density
- D) Shape

Q42. The Density of a mixture of two liquids is minimum when:

- A) The total volume is equal to the sum of individual volumes ($V_{mix} = V_1 + V_2$)
- B) The total volume contracts after mixing ($V_{mix} < V_1 + V_2$)
- C) The total volume expands after mixing ($V_{mix} > V_1 + V_2$)
- D) Density is independent of volume change

Q43. Interference requires coherence in:

- A) Amplitude
- B) Frequency & phase
- C) Direction only
- D) Intensity

Q44. Polarizer + analyzer crossed gives intensity:

- A) Max
- B) Half
- C) Zero
- D) Double

Q45. Resolving power \propto

- A) $1/\lambda$
- B) λ
- C) λ^2
- D) $\sqrt{\lambda}$

Q46. Numerical aperture defined as:

- A) $n \sin\theta$
- B) $n \cos\theta$
- C) $\sin\theta/n$
- D) $\tan\theta$

Q47. Brightest diffraction maximum is:

- A) First
- B) Central
- C) Second
- D) Last

Q48. Michelson interferometer measures:

- A) Voltage
- B) Wavelength precisely
- C) Charge
- D) Density

Q49. Electron microscope cannot image living cells due to:

- A) Low magnification
- B) Vacuum requirement
- C) Low NA
- D) Diffraction

Q50. Superposition valid only for:

- A) Linear systems
- B) Nonlinear systems
- C) Chaotic systems
- D) Dissipative systems



Answer Key

1D 2A 3C 4B 5B 6C 7B 8C 9A 10B 11B 12C 13B 14B 15B 16A 17C 18A 19B 20C
21B 22B 23A 24C 25C 26B 27C 28A 29B 30B 31B 32A 33B 34B 35C 36B 37A 38A
39C 40C 41A 42C 43B 44C 45A 46A 47B 48B 49B 50A.

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