IIT JAM Physics Most Repeated Questions

You can check out the list of most repeated questions of the IIT JAM Physics paper from the section shared below.

1. For a particle moving under an inverse-square law force, which of the following are conserved? A) Angular momentum
B) Mechanical energy
C) Linear momentum D) Speed
Correct Answer: A, B

2. A Zener diode is connected in reverse bias with input voltage of 8 V. If the breakdown voltage is 6 V, what is the output voltage?
A) 6 V
B) 8 V
C) 0 V
D) 2 V
Correct Answer: A

3. Which of the following are correct for an intrinsic semiconductor?
A) Fermi level is at the center of the band gap
B) Conductivity increases with temperature
C) Majority carriers are holes
D) Band gap is zero
Correct Answer: A, B

4. In a double-slit experiment, the slit separation is 0.25 mm, the screen is 1 m away, and the light used has a wavelength of 500 nm. Find the **fringe spacing** (in mm)?

5. In Young's double-slit experiment, increasing slit separation will:
A) Increase fringe width
B) Decrease fringe width
C) Not affect fringe width
D) Increase intensity
Correct Answer: B

6. A square loop enters a uniform magnetic field region. Which of the following statements are true?
A) Induced emf is generated
B) Current flows in the loop
C) Magnetic force opposes entry
D) Magnetic flux through loop remains constant
Correct Answer: A, B, C

7. A circular loop (radius = 0.1 m) rotates in a magnetic field of 0.5 T at 50 Hz. Find the **maximum emf induced** (in V)?
εmax =BAω

8. Calculate the **efficiency** of a Carnot engine operating between 500 K and 300 K.
η=1−TH TC

9. Which of the following quantities remain constant in an adiabatic reversible expansion of an ideal gas?
A) Temperature
B) Entropy
C) Internal energy
D) Total energy
Correct Answer: B

10. Which of the following are eigenfunctions of d2dx2\frac{d^2}{dx^2}dx2d2 ?
A) sin x\sin xsinx
B) x2x^2x2
C) exe^xex
D) cos x\cos xcosx
Correct Answer: A, C, D

11. Solve the differential equation dydx=y\frac{dy}{dx} = ydxdy =y, given that y(0)=2y(0) = 2y(0)=2. Find y(1)y(1)y(1).

12. A particle has a rest mass of 1 kg and moves at **0.8c**. Calculate its relativistic kinetic energy in **MeV** (rounded to nearest whole number).
K.E.=(γ−1)mc2K.E. = (\gamma - 1)mc^2K.E.=(γ−1)mc2

13. Which of the following transitions in the hydrogen atom emits the **highest-energy photon**?
A) n = 3 → n = 2
B) n = 2 → n = 1
C) n = 4 → n = 3
D) n = 5 → n = 4
Correct Answer: B

14. A particle of mass 2 kg moves in a circular orbit under a central force. The radius is 1 m, speed is 2 m/s. Find the **magnitude of the central force** in newtons.

15. For a particle moving under an inverse-square law force, which of the following are conserved?
A) Angular momentum
B) Mechanical energy
C) Linear momentum

D) Speed
Correct Answer: A, B

16. A Zener diode is connected in reverse bias with input voltage of 8 V. If the breakdown voltage is 6 V, what is the output voltage?
A) 6 V
B) 8 V
C) 0 V
D) 2 V
Correct Answer: A

17. For a Carnot engine operating between 500 K and 300 K, efficiency is:
A) 0.4 B) 0.6 C) 0.2 D) 0.8

18. Fraction of molecules with energy > 2kT in an ideal gas?

19. A circular loop of radius **r = 0.1 m** rotates in a magnetic field B=0.5B = 0.5B=0.5 T at frequency **f = 50 Hz**.
Find the peak emf generated.

20. A rectangular loop enters a magnetic field region at constant velocity. Which of the following are correct?
A) Induced current opposes motion
B) Magnetic flux increases
C) Emf = B l v
D) Total force is zero
Correct Answer: A, B, C

21. A source emitting sound of 1000 Hz approaches a stationary observer at 20 m/s (speed of sound = 340 m/s). Observed frequency is closest to:
A) 1058 Hz B) 1020 Hz C) 980 Hz D) 970 Hz

22. A double-slit experiment has slit spacing **d = 0.5 mm**, screen at 2 m, and wavelength **600 nm**.
Find the fringe spacing Δy on the screen.

23. Consider a diode circuit with input **Vin**, output **Vout**, and a Zener diode of breakdown 5V. Which of the following are true?
A) Zener conducts above 5V
B) Vout never exceeds 5V
C) Zener blocks all forward bias
D) Ideal Zener acts as voltage regulator
Correct Answer: A, B, D

24. In an intrinsic semiconductor, the Fermi level lies:
A) At the conduction band
B) At the valence band
C) Midway between valence and conduction bands
D) Outside the band gap
Correct Answer: C

25. For a particle in uniform circular motion under a central force:
Which of the following are true?
A) Angular momentum is conserved
B) Total energy is conserved
C) Torque is zero
D) Linear momentum is constant
Correct Answer: A, B, C