

Online Assessment (Special Examination) (Even Sem/Part-I/Part-II Examinations 2019 - 2020

Course Name - Engineering Physics II

Course Code - PH 201

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Answer all the questions. Each question carry one mark.

9. 1. A perfectly black body

Mark only one oval.

- absorbs all the incident radiation
- allow all the incident radiation to pass through it
- has its surface coated with lamp black or graphite
- None of these

10. 2. In Graded Index fibre refractive index vary

Mark only one oval.

- tangentially
- transversely
- radially
- longitudinally

11. 3. An optical fibre whose core and cladding are made of materials of refractive index 1.6 and 1.5 respectively. Numerical aperture of the optical fibre is

Mark only one oval.

- 0.55677
- 55.77
- 0.2458
- 0.647852

12. 4. Population inversion in preparing laser beam can be achieved

Mark only one oval.

- when one of the excited states is less populated than the ground state
- when one of the excited states is more populated than the ground state
- when the population of one excited state and the ground state are equal
- None of these

13. 5. The device, expected to have the highest input impedance is

Mark only one oval.

- MOSFET
- BJT
- JFET
- None of these

14. 6. For small value of damping constant, the quality factor

Mark only one oval.

- decreases
- increases
- remains constant
- None of these

15. 7. A process during which the pressure remains constant is

Mark only one oval.

- isometric process
- isothermal process
- isochoric process
- isobaric process

16. 8. Pauli's exclusion principal has been used in

Mark only one oval.

- MB statistics
- BE statistics
- FD statistics
- both BE and FD statistics

17. 9. The number of possible arrangements of three Boltzons in three cell is

Mark only one oval.

- 1
- 3
- 9
- 27

18. 10. If the velocity of a particle executing SHM is maximum, then displacement will be

Mark only one oval.

- maximum
- minimum
- less than zero
- greater than zero

19. 11. If two SHM of the same amplitude, time period and phase act at right angles to each other, the resultant vibration is

Mark only one oval.

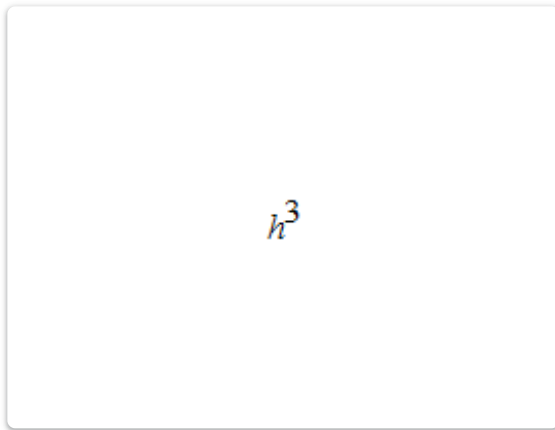
- elliptical
- circular
- straight line
- parabolic

20. 12. In F-D statistics, the volume of phase cell is

Mark only one oval.

h

h^2



Option 3

not fixed

21. 13. The relation between entropy S and thermodynamical probability W is given by

Mark only one oval.

$$S = K_B \ln W$$

Option 1

$$S = 2K_B \ln W$$

Option 2

$$S^2 = K_B \ln W$$

Option 3

$$W = K_B \ln S$$

Option 4

22. 14. In the Heisenberg uncertainty principle, two measurable properties of a particle cannot be observed precisely at the same time are

Mark only one oval.

- spin and colour
- energy and torque
- position and momentum
- size and speed

23. 15. The SI unit of the force constant of a spring is

Mark only one oval.

Nm

N/m

Nm²

N

24. 16. If ω is the angular frequency of a body and k is the damping constant, then its quality factor is

Mark only one oval.

ω/k

$2\omega/k$

$\omega/2k$

None of these

25. 17. Relativistic momentum-energy relation is

Mark only one oval.

$$E = \sqrt{p^2 c^2 + m_0^2 c^4}$$

Option 1

$$E = \sqrt{p^2 c^2 - m_0^2 c^4}$$

Option 2

$$E = \sqrt{p^2 c^2 + m_0 c^4}$$

Option 3

$$E = \sqrt{pc + m_0 c^4}$$

Option 4

26. 18. Example of weakly damped harmonic oscillator is

Mark only one oval.

dead-bead galvanometer

tangent galvanometer

ballistic galvanometer

None of these

27. 19. The total energy operator can be written as

Mark only one oval.

$$-i\hbar \frac{\partial}{\partial t}$$

Option 1

$$i\hbar \frac{\partial}{\partial t}$$

Option 2

$$-\hbar \frac{\partial}{\partial t}$$

Option 3

$$\hbar \frac{\partial}{\partial t}$$

Option 4

28. 20. Which of the following is incorrect

Mark only one oval.

$$[\hat{z}, \hat{p}_z] = i\hbar$$

Option 1

$$[\hat{z}, \hat{p}_z] = i\hbar$$

Option 2

$$[\hat{L}_x, \hat{L}_y] = i\hbar L_z$$

Option 3

$$[\hat{L}_x, \hat{x}] = i\hbar y$$

Option 4

29. 21. The pinch-off voltage is equal to

Mark only one oval.

- drain-to-source voltage
- gate-to-source voltage
- gate-to-source cut-off voltage
- gate voltage

30. 22. The ratio of He to Ne in a He-Ne laser is of the order of

Mark only one oval.

1:15

1:10

5:1

1:1

31. 23. For a Wein bridge oscillator, the frequency f is given by

Mark only one oval.

$$f = 1/2\pi RC$$

Option 1

$$f = 1/\sqrt{2\pi RC}$$

Option 2

$$f = 1/2\pi R C$$

Option 3

$$f = 2\pi/RC$$

Option 4

32. 24. The average energy of harmonic oscillator in 3 dimension is

Mark only one oval.

- kT
- 3kT
- 3KT/2
- KT/5

33. 25. A differential amplifier

Mark only one oval.

- is a part of an Op-amp
- has one input and one output
- has two outputs
- is a part of an Op-amp and has one input, one output

34. 26. The mathematical formula for Fermi energy at 0 K is

Mark only one oval.

$$\frac{\hbar^2}{8\pi V} \left(\frac{3N}{2m} \right)^{\frac{2}{3}}$$

Option 1

$$\frac{\hbar^2}{2m} \left(\frac{3N}{8\pi V} \right)^{\frac{2}{3}}$$

Option 2

$$\frac{\hbar^3}{2m} \left(\frac{3N}{8\pi V} \right)^{\frac{2}{3}}$$

Option 3

$$\frac{\hbar^2}{2m} \left(\frac{3N}{8\pi V} \right)^{\frac{3}{2}}$$

Option 4

35. 27.

If two waves functions $\psi_m(x)$ and $\psi_n(x)$ are orthogonal to each other, mathematically it will be represented by

Mark only one oval.

$$\psi_m^*(x)\psi_n(x)dx = 0$$

Option 1

$$\psi_m^*(x)\psi_n(x)dx = 1$$

Option 2

$$\int_{-\infty}^{+\infty} \psi_m^*(x)\psi_n(x)dx = 1$$

Option 3

$$\int_{-\infty}^{+\infty} \psi_m^*(x)\psi_n(x)dx = 0$$

Option 4

36. 28. The Schrodinger time independent equation can be written as

Mark only one oval.

$$H\psi = E\psi$$

Option 1

$$H\psi = (E - V)\psi$$

Option 2

$$H\psi = (E + V)\psi$$

Option 3

$$H\psi + E\psi = 0$$

Option 4

37. 29. The MB statistics applicable for

Mark only one oval.

- distinguishable particle
- indistinguishable particle
- semi distinguishable particle
- None of these

38. 30. A glass of refractive index 1.5 immersed in oil of refractive index 1.1. The critical angle is

Mark only one oval.

$$i_c = \sin^{-1}(11/15)$$

Option 1

$$i_c = \cos^{-1}(0.8)$$

Option 2

$$i_c = \cos^{-1}(0.8)$$

Option 3

None of these

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