Sainath Education Trust's
Rajiv Gandhi College
of Arts, Commerce, & Science.Vashi Navi Mumbai.
{Permanently Affiliated to University Of Mumbai}
ACCREDITED BY NAAC, GRADE 'B'

Sample Multiple Choice Questions

Class: S.Y.B.Sc.

Subject: PHYSICS PAPER – II

Semester: IV

1. The walls of a particle in a box are supposed to be _____
a) Small but infinitely hard
b) Infinitely large but soft
c) Soft and Small
d) Infinitely hard and infinitely large

Ans. d

2. The wave function of the particle lies in which region?
a) x > 0
b) x < 0
c) 0 < X < L
d) x > L

Ans. c

3. The Energy of the particle is proportional to _____
a) n
b) n^{-1}
c) n^{2}
d) n^{-2}

Ans. C

4. For a particle inside a box, the potential is maximum at x = _____
a) L
b) 2L
c) L/2
d) 3L

Ans. a

5. The Eigen value of a particle in a box is _____
a) L/2

b) 2/L

© $\sqrt{\frac{L}{2}}$

(d) $\sqrt{\frac{2}{L}}$

Ans. d

6. Calculate the Zero-point energy for a particle in an infinite potential well for an electron confined to a 1 nm atom.

a) 3.9×10^{-29} J
b) 4.9×10^{-29} J
c) 5.9×10^{-29} J
d) 6.9×10^{-29} J

Ans.c

7. The concept of matter wave was suggested by_____

a) Heisenberg

(b) de Broglie

(c) Schrodinger

(d) Laplace

Ans. d

8. The intensity of the diffraction pattern is proportional to _____ of the wave function

(a) forth power

(b) cube

(c) sixth power

(d) square

Ans. d

9. The function representing matter waves must be _____

(a) complex

(b) real

(c) zero (d) infinity

Ans. a

10. The total probability of finding the particle in space must be _____

(a) zero

(b) unity

(c) infinity

(d) double

Ans. b

11. The normalized wave function must have _____ norm

(a) infinite

(b) zero

(c) finite

(d) complex

Ans. c

12. The Non-normalized wave function must have _____ norm

(a) infinite

(b) zero

(c) finite

(d) complex

Ans. a

13. For normalized wave function $\psi \rightarrow 0$ as $r \rightarrow$ ___

(a) 0

(b)1

c) α

d) -1

Ans. c

14. The square of the magnitude of the wave function is called_____

(a) current density

(b) probability density

(c) zero density

(d) volume density

Ans. b

15. The operator ∇ is called _____ operator

(a) Hamiltonian

(b) Laplacian

(c) Poisson

(d) vector

Ans. b

16. _____ principle states that the actual path taken by the light ray is one which minimizes the integral

(a) Heisenberg

(b) Hamilton's

(c) Maupertuis'

(d) Fermat's

Ans. c

17. These quantum mechanical entities (with some exceptions) must be:

a) Single-valued (and their derivatives too).

b) finite (and their derivatives too). c) continuous (and their derivatives too).

d) normalizable or square-integrable.

Ans. a

18. The eigenvalues of a particle incident on s potential barrier are _____

(a)zero

(b)discrete

©continuous

(d) infinite

Ans. c

19. The energy level of the one –dimensional harmonic oscillator are

(a) Continuous

(b) Equally spaced

© 2 –fold degenerate

d) 3 –fold degenerate

Ans. b

20. Schrodinger wave equation for a moving particle contains

(a) 1^{st} order time derivative

b) 2^{nd} order time derivative

c) 3rd order time derivative ✌✌

d) 4th order time derivative

Ans. a

21. For a stationary state the probability density is _____

a) Function of time

b) Independent of space coordinate

c) Independent of time

d) Independent of energy

Ans. a

22. Expectation value of position is _____

a) <x>

b) (x)

c) <x)

d) (x>

Ans. a

23. The transmission and refection coefficients is

a) R +T = 1

b) R – T = 1

c) R = T

d) R = 2T

Ans. a

24. If the total energy E is less than potential V0 ,then the k.E. in the region of potential is

a) positive

b)negative

c)zero

d) infinity

Ans. b

25. In the case of one dimensional infinite deep potential, the principle quantum number n cannot have the value _____

a) 0

b)1

c)2

d)3

Ans. a