

JEST EXAMS

(MEMORY BASED QUESTIONS)

Q 1. If a person has a meter scale and he has to measure a length of 50 m. Each time he measures the measurement lies from 99.8 to 100.2 cm. Estimate the net error, when takes measurement 50 times?

- (a) 0.2 cm (b) 0.4 cm (c) 0.82 cm (d) 10 cm.

Q 2. If coherent source of light through A,B has wavelength λ such $AB = 4\lambda$. If the detector is moving along the loop of radius R such that $R \gg AB$ then if the radius is increased gradually what effect will it have on the no. of maxima detected by detector D?

- (a) increase (b) decrease (c) first increase than decrease (d) none

Q 3. Slit separation = d

Slit width = w

A plane wavefront incident, when will the 3rd maxima will be missing

- (a) $3d = 2w$ (b) $2d = 3w$ (c) $d = 2w$

Q 4. Find

$\lim_{z \rightarrow 0}$

$$\left(\frac{z}{2} \right) \left(\frac{z}{2} \right)$$

Real z Img z

z

+

- (a) i (b) 1 (c) -1 (d) limit do not exist

Q 5. If $2^p - 1 =$ Prime no.

- (a) P is a odd no. (b) P can composite no. (c) P is necessarily composite no. (d) P is Prime no.

Q 6. Find the velocity of box

- (a) $v \cos \theta$ (b) $v \sin \theta$ (c) $v \tan \theta$

Q 7. What is the volume of a sphere in 4-dimensional space of unit radius?

(a)

$\frac{2}{3}$

16

π

(b) 4

$\frac{3}{2}$

π

(c) 4π i

Q 8. A hard ball dropped from a 1 m height and rebounds to 95 cm. Calculate the total distance travelled by ball?

(a) 1880 cm (b) 2160 cm

Q 9. Evaluate $\int_0^{\pi} \cos^2 x \sin^2 x dx$

1
2 2 3

$\int_0^{\pi} \cos^2 x \sin^2 x dx$

+ - J □ ∫

(a) 0, (b) $2\pi i$

Q 10. If EM wave $E = E_0 \sin(kx - \omega t)$

is filed component along y in with magnitude E_0 , travelling along x-axis with frequency ω . represent this

Ans. $\cos(kx - \omega t) \hat{y}$

Q 11. If an astronaut knows the maximum and min distance between the moon of a planet and the planet maximum orbital velocity of moon is know which quantity of the following can't be calculated.

A
B
A, B are known

(a) mass of planet (b) mass of moon (c) Time of the orbit (d) semi major axis.

Q 12. If P and q are two distinct prime numbers then how many divisors p^2q^3 have?

Q 13. represent carnot cycle in T – S diagram

Q 14. If proton and α – particle accelerated by same potential v , find the ratio of debroglie wavelength ?

(a) 2 2:1 (b) 2:1 (c) 1 : 2 (d) none of these

Q 15. The difference in arithmetic and geometric mean of two positive integer m and n is equal to 1. Then

2
 m and
2
 n are

(a) perfect square
(b)

Q 16. Net capacitance

(a) $C_1 + C_2 + C_3$ (b)

123
 111
 CCC
 $++(c)_{23}$
 1
 23
 CCC
 CC
 $+$
 $+$

Q 17. Two events are taking place at a distance 5 km with a time interval 5μ s. In an inertial frame. An observer observes two events as simultaneous. Determine the speed of observer.

Q 18. Find the time taken for blue light $\lambda = 400nm$, to cover a distance of 80 km in optical fiber having refractive .Index = 1.6
 Ans. 427μ sec.

Q 19. Find ()₅
 11
 $12 \dots$
 k
 kl
 l
 $= =$
 $\sum \sum + +$

Q 20. ()
 3
 $, 1 \cos o$
 $arEr$
 r
 $\int_0^\phi \left(\frac{\theta}{r} \right) \Big|_0^\theta = - | - | | |$

(Potential distribution of sphere of charge q)
 Find the charge distribution
 (a) $2_oE \in \cos \theta$ (b) $\cos o \in E \theta$

Q 21. A small mass m moving with velocity collides with turnable table get attached after collision and moves with angular velocity w? find w?

Q 22. Find the solution of given differential equation.
 $x dy 3y x^2$
 dx

- =

(a) $y = x^2 + cx^2$ (b) (c) (d)

Q 23. If x and y both are non-zero then the value of $x^2 + xy + y^2$

(a) always +ve (b) always -ve (c) 0 (d) sometimes +ve and sometime -ve

Q 24. ()

x^2

x^2

$V = kx + Lx$ (a potential fn for a particle in a box)

(a) V is oscillatory (b) v is never oscillate (c)

Q 25. Find eigen value and eigen vector

$\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

$\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

Q 26. Then

(a) $B C I F E = E = E$ (b) $B C I F E = E \leq E$ (c) $F B C I E > E > E$ (d) $F B C I E > E = E$

Q 27. A curve moves from origin to a point P(1, 1) then ()

0

$\int_P^0 y' + yy' + y dx$ will be stationary

for

(a) $y = x$ (b) $y = x^2$

Q 28. A proton accelerated by a potential difference of 1000 V and enter into magnetic field $B = 1000$ T along a circular path of $r = 20$ cm. Determine the velocity of proton during circular motion.

(a) 1 m/s (b) 105m/s (c) 100 m/s (d) none

Q 29. A mass m is attached to a spring with one end to a rigid support and to other end a spring is connected which is attached to a mass m. having same spring constant calculate the node frequency.

Q 30. A particle moving with velocity v hits the uniform circular disc at rest with impact parameter ($b < R$) afterwards both particles and disc rotates with same angular velocity

ω . then ω in terms of v is,

Q 31. If donors are added to n-type semiconductor then

(i) Electrons increases holes remain constant

(ii) Electrons increases holes decreases

(iii) Electrons increases holes increases

(iv) No effect will take place.

Q 32. A particle X of mass M at rest decays into a particle A of mass m_A and another particle of zero mass. Determine the energy of A.

Q 33. If B/A decreases with increases atomic number, then what does it indicate about nuclear number, than what does it indicate about nuclear forces?

(a) charge dependent

(b) Charge independent

Q 34. The spin and parity of ${}_{12}C$ and ${}_{17}O$?

(a) 0, 5

2

+

+ (b) 0, 5

2

-

+ (c) 1, 7

2 2

++

(d) 0, 3

2

+

-

Q 35. A charge q drops from rest from height d to infinite grounded conducting plates. Calculate the time to reach the charge to plates.