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>> 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

$$\lim_{z \to 0} \frac{(\text{Real } z)^2 - (\text{Img } z)^2}{z + z^*}$$

(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) $\frac{16}{2}\pi^2$
(b) $\frac{4}{3}\pi^3$
(c) $4\pi i$

Q 8. A heard ball dropped from a 1 m height and rebounces to 95 cm. Calculate the total distance travelled by ball?
(a) 1880 cm (b) 2160 cm

Q 9. Evaluate 3
1
2 2 3
z
π ⎨ $i\ z\ z\ i$
⎫ ⎧
$+ \ -$ ⎭ □ ∫
(a) 0, (b) $2\pi i$

Q 10. If EM wave E □
is filed component along y in with magnitude E_o, travelling along x-axis
with frequency w. represent this
Ans. cos ( ) $_oE = E\ Kx - wt\ y_\lambda$

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 $\alpha -$ 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)

1 2 3
1 1 1
C C C
+ + (c) 2 3
1
2 3
C C C
C C
+
+

Q 17. Two events are taking place at a distance 5 km with a time interval 5 μ 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. 427 μ sec.

Q 19. Find ( ) 5
1 1
1 2 ...
k
k l
l
= =
$\sum \sum$ + +

Q 20. ( )
3
, 1 cos o
a r E r
r
$\left[\phi\left(\theta\right)\right]_{\theta}$ = – | –| | |
(Potential distribution of sphere of change q)
Find the change distribution
(a) $2\,{}_o E \in cos\,\theta$ (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. ( )
2 3
$_x$2 3
$V = kx + Lx$ (a potential f_n for a particle in a box)
(a) V is oscillatory (b) v is never osicllater (c)

Q 25. Find eigen value and eigen vector
2 2
2 1
⎡ ⎤
⎢ ⎥
⎣ ⎦

Q 26. Then
(a) $_{BCl\,F}E = E = E$ (b) $_{BCl\,F}E = E \leq E$ (c) $_{F\,BCl}E > E > E$ (d) $_{F\,BCl}E > E = E$

Q 27. A curve moves from origin to a point P(1, 1) then $\left({}_{2\,2} \right)$
0
$_P \int y' + yy' + y\,dx$ 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) 10^5m/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 takes 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.