



PHYSICS

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

MOCK TEST 5

Mcqs

1. The earth's magnetic field may be considered to be due to a short magnet

placed at the centre of the earth and oriented along the magnetic south-north direction. The ratio of the magnitude of the magnetic field on the earth's magnetic equator to that at the magnetic poles is

A. 1 : 2

B. 2 : 1

C. 1 : 4

D. 4 : 1

Answer: A



2. Eddy currents are produced when

- A. a metal is kept in varying magnetic field
- B. a metal is kept in a steady magnetic field
- C. a circular coil is placed in a magnetic field
- D. a current is passed through a circular coil

Answer: A



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3. What is the energy of a photon in eV corresponding to the visible light of maximum wavelength?

A. 3.2 eV

B. 7 eV

C. 1.65 eV

D. 1 eV

Answer: C



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4. Bohr's atomic model gained acceptance above all other models because it:

A. gave the picture of a stable atom

B. explained the hydrogen spectrum

C. explained the constitution of atom

D. gave the idea of non-radioactive orbit

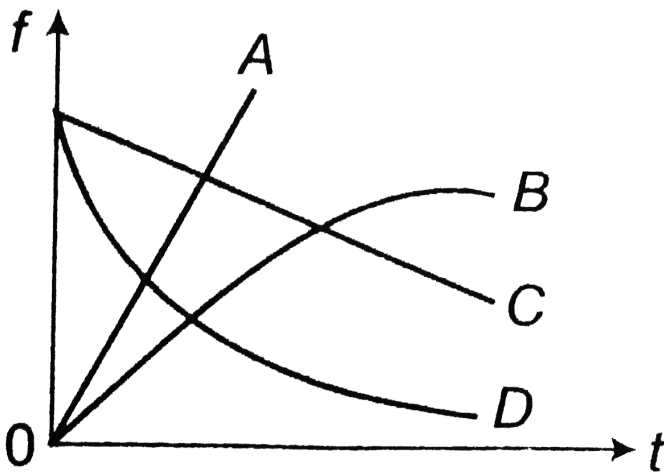
and explained hydrogen spectrum

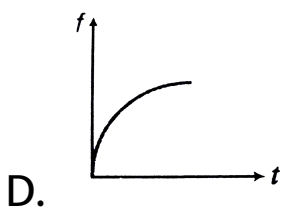
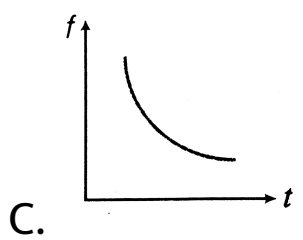
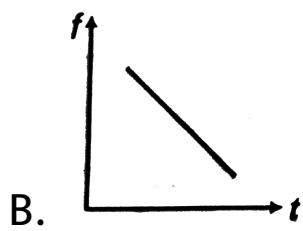
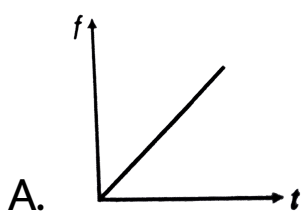
Answer: D



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5. The fraction f of radioactive material that has decayed in time t , varies with time t . The correct variation is given by the curve.





Answer: C

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6. The incorrect statement out of the following

A. television uses point to point contact mode for operation

B. satellite communication uses the frequencies in the range of giga hertz

C. sky wave propagation employes reflection of electromagnetic waves from the earth's ionosphere.

D. space wave uses both line of sight mode of communication (LOS) as also satellite communication

Answer: A



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7. What happens to the centripetal acceleration of a revolving body if you double the orbital speed v and half the angular velocity ω

- A. the centripetal acceleration remains unchanged
- B. the centripetal acceleration is halved
- C. the centripetal acceleration is doubled
- D. the centripetal acceleration is quadrupled

Answer: A



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8. A geostationary satellite

A. revolves about the polar axis

B. has a time period less than that of the
near earth satellite

C. moves faster than a near earth satellite

D. is stationary in the space

Answer: A



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9. A spherical solid ball of 1 kg mass and radius 3 cm is rotating about an axis passing through its centre with an angular velocity of 50 rad s^{-1} . The kinetic energy of rotation is

A. 4500 J

B. 90 J

C. 910 J

D. $9/20$ J

Answer: D



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10. If a hole is bored along the diameter of the earth and a stone is dropped into hole

A. the stone reaches the centre of the earth and stops there

B. the stone reaches the other side of the earth and stops there

C. the stone executes simple harmonic motion about the centre of the earth

D. the stone reaches the other side of the earth and escapes

Answer: C



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11. A simple pendulum is suspended from the roof of a trolley which moves in a horizontal direction with an acceleration α , then the time

period is given by $T = 2\pi \sqrt{\left(\frac{l}{g}\right)}$ where g is

equal to

A. g

B. $g - a$

C. $g + a$

D. $\sqrt{g^2 + a^2}$

Answer: D



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12. A compound microscope has an eye piece of focal length 10cm and an objective of focal length 4cm . Calculate the magnification, if an

object is kept at a distance of 5cm from the objective so that final image is formed at the least distance vision (20cm)

A. 12

B. 11

C. 10

D. 13

Answer: A



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13. There is no change in the volume of a wire due to change in its length on stretching. The poisson's ratio of the material of the wire is

A. $+0.50$

B. -0.50

C. $+0.25$

D. -0.25

Answer: B



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14. Soap helps in cleaning clothes, because

A. it reduces the surface tension of solution

B. it gives strength to solution

C. it absorbs the dirt

D. chemical of soaps change

Answer: A



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15. If wave $y = A \cos (\omega t + kx)$ is moving along x-axis The shape of pulse at $t = 0$ and $t = 2 \text{ s}$

- A. are different
- B. are same
- C. may not be same
- D. none of th above

Answer: B



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16. The velocity of soundd is not affected by change inn

A. temperature

B. medium

C. pressure

D. none of these

Answer: C



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17. In case of molecules of an ideal gas, which of the following , average velocities cannot be zero?

A. $\langle \bar{v} \rangle$

B. $\langle \bar{v}^3 \rangle$

C. $\langle \bar{v}^4 \rangle$

D. $\langle \bar{v}^5 \rangle$

Answer: C



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18. Waves that cannot be polarised are

A. sound waves

B. longitudinal waves on a string

C. transverse waves on a string

D. light waves

Answer: D



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19. In an interference pattern the position of zeroth order maxima is 4.8 mm from a certain point P on the screen. The fringe width is 0.2 mm. The position of second minima from point P is

A. 5.1 mm

B. 5 mm

C. 40 mm

D. 5.2 mm

Answer: A



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20. If n identical drops of mercury are combined to form a bigger drop then find the capacity of bigger drop, if capacity of each drop of mercury is C .

A. $n^{1/3}C$

B. $n^{2/3}C$

C. $n^{1/4}C$

D. nC

Answer: A



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21. Calculate amount of charge flow, when a conducting sphere of radius R and carrying a charge Q , is joined to an uncharged conducting sphere of radius $2R$.

A. $\frac{Q}{4}$

B. $\frac{Q}{3}$

C. $\frac{Q}{2}$

D. $\frac{2Q}{3}$

Answer: D



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22. A wire of length l is bent in the form a circular coil of some turns. A current I flows through the coil. The coil is placed in a uniform magnetic field B . The maximum torquar on the coil can be

A. iBl^2

B. $4\pi iBl^2$

C. $\frac{il^2B}{4\pi}$

D. zero

Answer: C



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23. When a monochromatic source of light is at a distance of 0.2 m from a photocell, the stopping potential (cut off voltage) and the saturation current are found to be

respectively 1 V and 27 mA. If the same source is placed at a distance 0.6 m from the cell, then

A. the stopping potential will be 0.25 V and current will be 27 mA.

B. the stopping potential will be 1 V and the current will be 3 mA

C. the stopping potential will be 1 V and the current will be 9 mA

D. the stopping potential and the current will be same as before.

Answer: B



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24. An iron rod of cross-section area 4cm^2 is placed with its length along a magnetic field of intensity 1200 S m^{-1} . The flux through the rod is $40 \times 10^{-4}\text{ Wb}$. The permeability of the rod is

A. $8.3 \times 10^{-3} \text{WbA}^{-1} \text{m}^{-1}$

B. $8.3 \times 10^{-4} \text{WbA}^{-1} \text{m}^{-1}$

C. $8.3 \times 10^{-5} \text{WbA}^{-1} \text{m}^{-1}$

D. $8.3 \times 10^{-6} \text{WbA}^{-1} \text{m}^{-1}$

Answer: A



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25. The self-inductance of a straight conductor is

A. very small

B. very large

C. zero

D. infinity

Answer: C



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26. For the electron to revolve round the nucleus without radiating energy in the orbit, the electron orbit should be

A. circular

B. elliptic

C. having an angular momentum equal to

$$n \left(\frac{h}{2\pi} \right)$$

D. consisting of only one electron in its orbit

Answer: C



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27. The activity of a radioactive sample is independent of

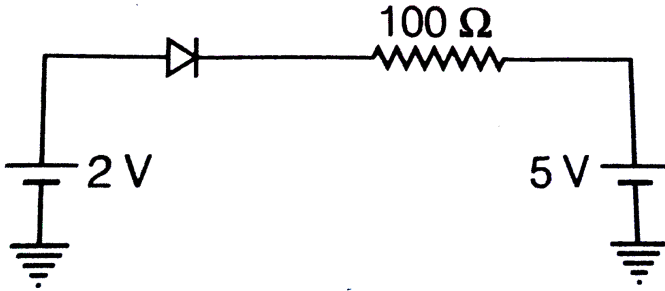
- A. the mass number of the nucleus
- B. the mass of the sample
- C. the number of atoms in the sample
- D. the physical conditions

Answer: D



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28. Current through the ideal diode as shown in the figure is



A. zero

B. 20 A-m

C. $\left(\frac{1}{20}\right) A$

D. $\left(\frac{1}{50}\right) A$.

Answer: A



29. If h_T and h_R are the height of the transmitting and receiving antennas above the earth's surface and R is the radius of earth, then distance between the transmitting and receiving antenna is

A. $\sqrt{(2h_R + 2h_T)R}$

B. $\sqrt{2Rh_T} + \sqrt{2Rh_R}$

C. $\sqrt{\left(\frac{h_T}{h_R}\right)R}$

$$D. \sqrt{\frac{(h_T^2 + h_R^2)}{R}}$$

Answer: B



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30. A particle rests on the top of a hemisphere of radius R . Find the smallest horizontal velocity that must be imparted to the particle if it is to leave the hemisphere without sliding down :

A. \sqrt{gR}

B. $\sqrt{2gR}$

C. $\sqrt{3gR}$

D. $\sqrt{5gR}$

Answer: A



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31. A satellite of the earth is revolving in a circular orbit with a uniform speed v . If the

gravitational force suddenly disappears, the satellite will

A. continue to move with velocity v along the original orbit

B. move with a velocity v , tangentially to the original orbit

C. fall down with increasing velocity

D. ultimately come to rest somewhere on the original orbit

Answer: B



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32. A particle of mass M and radius of gyration K is rotating with angular acceleration α . The torque acting on the particle is

A. $\frac{1}{2}MK^2\alpha$

B. $MK^2\alpha$

C. $\frac{MK^2}{\alpha}$

D. $\frac{MK^2\alpha^2}{4}$

Answer: B



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33. When the point of suspension of pendulum is moved, its period of oscillation

A. decreases when it moves vertically

upwards with acceleration a

B. decreases when it moves vertically

downwards with acceleration greater

than g .

C. increases when it moves horizontally

with acceleration a

D. decreases when it moves horizontally

with acceleration.

Answer: C



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34. The motion of a particle executing S.H.M. is given by $x = 0.01 \sin 100\pi(t + .05)$, where x

is in metres and time is in seconds. The time period is

A. 0.01

B. 0.02

C. 0.1

D. 0.2

Answer: B



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35. A spherical ball contracts in volume by 0.01% when subjected to a normal uniform pressure of 100 atmospheres. Calculate the bulk modulus of the material.

A. 10×10^{12}

B. 100×10^{12}

C. 1×10^{12}

D. 2.0×10^{11}

Answer: C



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36. The meniscus of mercury in the capillary tube is

A. concave

B. convex

C. plane

D. cylindrical

Answer: B



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37. A physical quantity A is related to four observable a,b,c and d as follows, $A = \frac{a^2b^3}{c\sqrt{d}}$, the percentage errors of measurement is a,b,c and d,are 1 % ,3 % ,2 % and 2 % respectively. What is the percentage error in the quantity A?

- A. 0.12
- B. 0.07
- C. 0.05
- D. 0.14

Answer: D



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38. If the order of two vectors A and B is reversed in the cross product of two vectors, then resultant vector

A. changes only in direction

B. changes in magnitude

C. changes in magnitude and direction

D. doesnot change both in magnitude and
direction

Answer: A



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39. A boy weighing 50kg eats bananas. The energy constant of banan is 100cal , if this energy is used to lift the body from ground, then the height through which his lifted is

A. 8.57

B. 10.57m

C. 6.57 m

D. 5.57 m

Answer: A



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40. There are 10 sound sources each producing intensity I at a point independently.

The are incoherent. Average intensity of sound at that point will be:

A. nl_0

B. $\frac{l_0}{n}$

C. n^2l_0

D. none of these

Answer: A



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41. A ray of light travelling in water is incident on its surface open to air. The angle of incidence is θ , which is less than the critical angle. Then there will be

A. only a reflected ray and no refracted ray

B. only a refracted ray and no reflected ray

C. a reflected ray and a refracted ray and

the angle between them would be less

than $180^\circ - 2\theta$

D. a reflected ray and refracted ray and the angle between them would be greater than $180^\circ - 2\theta$.

Answer: C



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42. A magnetic needle has a magnetic moment $5.0 \times 10^{-2} \text{ A m}^2$ and moment of inertia of $7.8 \times 10^{-6} \text{ kg m}^2$, it performs 12 complete

oscillations in 6.0 s. What is the magnitude of magnetic field ?

A. 0.012 T

B. 0.120 T

C. 1.200 T

D. 2.10 T

Answer: A



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