



# PHYSICS

## BOOKS - TARGET PHYSICS (HINGLISH)

### MODEL QUESTION PAPER

#### Model Question Paper I

1. The magnitude of the gravitational field at distance  $r_1$  and  $r_2$  from the centre of a

uniform sphere of radius  $R$  and mass  $M$  are

$F_1$  and  $F_2$  respectively. Then:

A.  $\frac{F_1}{F_2} = \frac{r_1}{r_2}$  if  $r_1 < R$  and  $r_2 < R$

B.  $\frac{F_1}{F_2} = \frac{2r_1^2}{r_2}$  if  $r_1 > R$  and  $r_2 > R$

C.  $\frac{F_1}{F_2} = \frac{r_1}{r_2}$  if  $r_1 > R$  and  $r_2 > R$

D.  $\frac{F_1}{F_2} = \frac{r_1^2}{r_2^2}$  if  $r_1 < R$  and  $r_2 < R$

**Answer: A**



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2. If the sum of two unit vectors is a unit vector, then find the magnitude of their differences.

A.  $\sqrt{2}$

B.  $\sqrt{3}$

C.  $\frac{1}{\sqrt{2}}$

D.  $\sqrt{5}$

**Answer: B**



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3. When a  $\beta$ -particle is emitted from a nucleus, the neutron-proton ratio

A. is decreased

B. is increased

C. remains the same

D. first decreases and then increases

**Answer: A**



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4. A satellite has to revolve round the earth in a circular orbit of radius  $8 \times 10^3$  km. The velocity of projection of the satellite in this orbit will be -

A. 3 km/s

B. 16 km/s

C. 7.16 km/s

D. 8 km/s

**Answer: C**



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5. A cylindrical tank has a hole of  $1.6\text{cm}^2$  in its bottom. If the water is allowed to flow into the tank from a tube above it at the rate of  $80\text{cm}^3 / \text{s}$ , then the maximum height up to which water can rise in the tank is

A. 0.25cm

B. 2.5cm

C. 5cm

D. 1.27cm

**Answer: D**



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6. If momentum ( $P$ ), area ( $A$ ), time ( $T$ ) and temperature ( $\theta$ ) are assumed to be fundamental quantities, then thermal capacity has dimensional formula

A.  $\left[ P^1 A^{-1/2} T^{-1} \theta^{-1} \right]$

B.  $\left[ P^1 A^{1/2} T^{-1} \theta^{-1} \right]$

C.  $\left[ P^2 A^{-1} T^{-1} \theta^{-1} \right]$

D.  $[P^1 A^{-1} T^1 \theta^1]$

**Answer: B**



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7. Pick up the correct statement.

A. Diffraction is exhibited by all the electromagnetic waves but not by mechanical waves.



B. Diffraction cannot be observed with a plane polarised light.

C. The width of central maximum in the diffraction pattern due to single slit decreases as wavelength increases.

D. The width of central maximum in the diffraction pattern due to single slit increases as wavelength increases.

**Answer: D**



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8. In Young's experiment for  $\lambda = 4000 \text{ \AA}$  fringes observed have width  $B$ . The light illuminating the set up now has  $\lambda = 6000 \text{ \AA}$  and the separation between the interfering sources is halved. What is the ratio of distance between the screen and the interfering sources before and now if the fringe width remains unaltered?

A. 1 : 3

B. 3 : 1

C. 3: 4

D. 2: 3

**Answer: B**



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9. Which of the following is regarding mutual inductance?

A. unit of M is henry

B. unit of M is  $Wb / ampere^2$

C.  $[M] = [ML^2T^{-2}A^{-2}]$

D. both (A) and (C)

**Answer: D**



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**10.** A machine gun has a mass 4 kg. It fires 50 gram bullets at the rate of 45 bullets per minute at a speed of  $400ms^{-1}$ . What force is required to keep the gun in position ?

A. 10N

B. 13.3N

C. 15N

D. 26N

**Answer: C**



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**11.** A wavefront is an imaginary surface, where

A. phase changes with constant rate in all directions along the surface.

B. phase changes with the same rate per unit length in all directions along the surface.

C. constant phase difference is always maintained.

D. phase is always the same for all the points.

**Answer: D**



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12. A child is standing with hands at the centre of a platform rotating about its central axis. The kinetic energy of the system is  $K$ . The child now stretches his arms so that the kinetic energy of the system is now.

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

B.  $\frac{K}{2}$

C.  $2K$

D. 4K

**Answer: B**



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**13.** Two simple pendulums of lengths 1.44 m and 1 m start swinging together. After how many vibrations will they again start swinging together

A. 5 oscillations of smaller pendulum



B. 6 oscillations of smaller pendulum

C. 4 oscillations of bigger pendulum

D. 6 oscillations of bigger pendulum

**Answer: B**



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**14.** Two identical tanks are placed on the two pans of a beam balance. One tank is empty and open to atmosphere. The second tank is evacuated and then filled with helium until the

two tanks are balanced The pressure of helium will be (Given that  $\rho_{air} = 7.5\rho_{He}$ ]

A. 15 atm

B. 7.5atm

C. 4atm

D. 1atm

**Answer: B**



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15. Which of the following transitions will have highest emission wavelength ?

A.  $n=2$  to  $n=1$

B.  $n=1$  to  $n=2$

C.  $n=2$  to  $n=5$

D.  $n=5$  to  $n=2$

**Answer: D**



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**16.** A cyclist is riding with a speed of 28.8 km/h. As he approaches a circular turn on the road of radius 80 m, he applies brakes and reduces his speed at constant rate of 0.6 ms the magnitude of the net acceleration of the cyclist is

A.  $1ms^{-2}$

B.  $0.5ms^{-2}$

C.  $0.75ms^{-2}$

D.  $1.25ms^{-2}$

**Answer: A**



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**17.** Einstein's photoelectric equation states that  $\frac{1}{2}mv^2 = hv - hv_0$ . In this equation  $v$  refers to

- A. velocity of all ejected electrons.
- B. mean velocity of emitted electrons.
- C. minimum velocity of emitted electrons.
- D. maximum velocity of emitted electrons.

**Answer: D**



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**18.** Angle of contact depends on

A. nature of liquids in contact only.

B. nature of solids in contact only.

C. the nature of solids and liquids both.

D. area of contact between the solid and  
the liquid.

**Answer: C**



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**19.** Magnetic field produced by electrons in atoms and molecules is due to their

- A. spin motion only.
- B. orbital motion only.
- C. spin and orbital motion both.
- D. neither spin nor orbital motion.

**Answer: C**



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**20.** In a step up transformer, if ratio of turns of primary to secondary is  $1:10$  and primary voltage is  $230V$ . If the load current is  $2A$ . Then the current in primary is

A.  $20A$

B.  $10A$

C.  $2A$



D. 1A

**Answer: A**



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21. A wire has breaking stress of  $6 \times 10^5 N/m^2$  and a density of  $3 \times 10^4 kg/m^3$ . The length of the wire of the same material which will break under its own weight, (if  $g = 10m/s^2$ ) is

A. 2m

B. 20m

C. 200m

D. 2000m

**Answer: A**



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**22. Select the WRONG statement.**

A. A potentiometer is a constant voltage device.

B. A potentiometer is a constant current device.

C. A potentiometer is used to measure e.m.f. of a cell.

D. A potentiometer is used to measure potential drop between two points in an electric circuit.

**Answer: A**



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23. When a particle is moved , in a verticle it has

A. it has constant radial and tangential acceleration.

B. it has variable tangential and radial acceleration.

C. it has only constant radial acceleration.

D. it has only constant tangential

**Answer: B**





24. The amplitude of sound is doubled and the frequency is reduced to one fourth. The intensity of sound at the same point will be

- A. increased to double.
- B. increased to four times.
- C. decreased to half.
- D. decreased to one fourth.

**Answer: D**



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25. Three capacitors of capacity  $C_1, C_2, C_3$  are connected in series. Their total capacity will be

A.  $C_1 + C_2 + C_3$

B.  $1/(C_1 + C_2 + C_3)$

C.  $(C_1^{-1} + C_2^{-1} + C_3^{-1})^{-1}$

D. None of these

**Answer: C**



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**26.** When an electron in hydrogen atom is excited, from its 4th to 5th stationary orbit, the change in angular momentum of electron is (Planck's constant:  $h = 6.6 \times 10^{-34} \text{ J} \cdot \text{s}$ )

A.  $4.16 \times 10^{-34} \text{ J} \cdot \text{s}$

B.  $3.32 \times 10^{-34} \text{ J} \cdot \text{s}$

C.  $1.05 \times 10^{-34} \text{ J} \cdot \text{s}$

D.  $2.08 \times 10^{-34} \text{ J} \cdot \text{s}$

**Answer: C**



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27. The total number of tubes of induction passing normally through a surface situated in an electric field is called

- A. normal electric induction
- B. total normal electric induction
- C. electric flux
- D. all the above



**Answer: B**



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**28.** Two identical magnetic dipoles of magnetic moments  $4A - m^2$  each, are placed at a separation of 4 m with their axis perpendicular to each other. The resultant magnetic field at a point midway between the dipoles is

A.  $5 \times 10^{-7} T$

B.  $\sqrt{5} \times 10^{-7}T$

C.  $10^{-7}T$

D.  $\frac{\sqrt{5}}{2} \times 10^{-7}T$

**Answer: D**



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**29.** The root mean square velocity of a gas molecule of mass  $m$  at a given temperature is proportional to

A.  $m^0$

B.  $m$

C.  $m^{1/2}$

D.  $m^{-1/2}$

**Answer: D**



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**30.** What will happen to the weight of the body at the south pole, if the earth stops rotating about its polar axis?

A. no change

B. increases

C. decrease but does not become zero

D. reduces to zero

**Answer: A**



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**31.** The coil of a moving coil galvanometer has 1000 turns each of area  $3 \times 10^{-4} m^2$ . Its suspension fibre has restoring torque of

$2 \times 10^{-4} \text{ N} - \text{m}$  per degree and the radial magnetic field of induction  $0.08 \text{ Wb/m}$ . If a current of  $10 \mu\text{A}$  is passed through it, then the deflection produced is

A.  $0.6^\circ$

B.  $1.0^\circ$

C.  $1.2^\circ$

D.  $0.8^\circ$

**Answer: C**



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32. A magnet is brought towards a coil (i) speedily (ii) slowly then the induced e.m.f./induced charge will be respectively

- A. more in first case /more in first case
- B. more in first case/equal in both case
- C. less in first case/more in second case
- D. less in first case/equal in both case

**Answer: B**



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**33.** If  $L$ ,  $M$  and  $P$  are the angular momentum, mass and linear momentum of a particle respectively, which of the following represents the kinetic energy of the particle when the particle rotates in a circle of radius  $R$ ?

A.  $\frac{L^2}{2M}$

B.  $\frac{P^2}{2MR}$

C.  $\frac{L^2}{2MR^2}$

D.  $\frac{MP}{2}$

**Answer: C**



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**34.** For the stationary wave

$$y = 4 \sin\left(\frac{\pi x}{15}\right) \cos(96\pi t),$$
 the distance

between a node and the next antinode is

A. 7.5

B. 15

C. 22.5

D. 30



**Answer: A**



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**35.** Two convex lenses of focal lengths  $f_1$  and  $f_2$  are separated co-axially by a distance  $d$ . The power of the combination will be one if

A.  $d = (f_1 + f_2) - f_1 f_2$

B.  $d = (f_1 - f_2) + f_1 f_2$

C.  $d = \sqrt{f_1 f_2} \cdot f_1 + f_2$

$$D. d = \left( \frac{f_1 - f_2}{2} \right)$$

**Answer: A**



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**36.** Length of antenna required to transmit the signals of frequency 100 MHz is nearly

A. 75m

B. 7.5m

C. 75cm

D. 7.5cm

**Answer: C**



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**37.** The current sensitivity of a moving coil galvanometer can be increased by

A. decreasing the magnetic field of the permanent magnet.

B. decreasing the area of the deflecting coil.

C. increasing the number of turns in the coil.

D. increasing the restoring couple of the coil.

**Answer: C**



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38. Sag in a bar of length  $l$  to weight applied its mid-point when it is supported at its end by fixed points at the same height proportional to

A.  $l$

B.  $l^2$

C.  $l^3$

D.  $\frac{1}{l}$

**Answer: C**



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39. A long wire carries a steady current. It is bent into a circle of one turn and the magnetic field at the centre of the coil is  $B$ . It is then bent into a circular loop of  $n$  turns. The magnetic field at the centre of the coil will be

A.  $4nB$

B.  $2n^2 B$

C.  $\frac{n^2 B}{4}$

D.  $\frac{B}{2n^2}$

**Answer: C**



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**40.** In a concave mirror experiment, an object is placed at a distance  $x_1$  from the focus and the image is formed at a distance  $x_2$  from the focus. The focus length of the mirror would be

A.  $x_1 x_2$

B.  $\sqrt{x_1 x_2}$

C.  $\frac{x_1 + x_2}{2}$

D.  $\sqrt{\frac{x_1}{x_2}}$

**Answer: B**



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**41.** The energy in the superposition of waves

A. is lost

B. increases



C. remains same, only redistribution occurs.

D. may increase or decrease depending upon the medium.

**Answer: C**



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**42.** In case of vibrating string, the frequency of the first overtone is equal to frequency of the first overtone is equal to frequency of the

A. fourth harmonic

B. first harmonic

C. second harmonic

D. third harmonic

**Answer: C**



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**43.** Two electrons move parallel to each other with equal speed ' $V$ ' the ratio of magnetic & electric force between them is

A.  $\sqrt{\frac{v}{c}}$

B.  $\left(\frac{c}{v}\right)^2$

C.  $\left(\frac{v}{c}\right)^2$

D.  $\sqrt{\frac{c}{v}}$

**Answer: C**



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**44.** If numerical aperture of a microscope is increased, then its

- A. resolving power decreases.
- B. resolving power remains the same.
- C. limit of resolution decreases.
- D. limit of resolution increases.

**Answer: C**



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**45.** A cyclotron of radius 64 cm accelerates deuterons ( $m = 3.3 \times 10^{-27} \text{ kg}$ ) if the cyclotron's frequency is 5MHz, then the

maximum speed with which the deuterons emerge, is

A.  $3 \times 10^7 \text{ m/s}$

B.  $2 \times 10^7 \text{ m/s}$

C.  $1.5 \times 10^7 \text{ m/s}$

D.  $2 \times 10^6 \text{ m/s}$

**Answer: B**



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**46.** A turtle in water (refractive index  $\mu$ ) looks at a stationary cloud vertically above in the air.

If  $h$  is the height of the cloud and  $d$  is the depth of the turtle from the surface, then the distance of the cloud as estimated by the turtle is

A.  $d + h \left( 1 + \frac{1}{\mu} \right)$

B.  $h + d \left( 1 - \frac{1}{\mu} \right)$

C.  $d + h \left( 1 - \frac{1}{\mu} \right)$

D.  $d + \mu h$

**Answer: D**



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## Model Question Paper Ii

1. Two solid spheres of same metal bar of mass  $8M$  and  $27M$  fall simultaneously on a viscous liquid and their terminal velocities are  $v$  and  $nv$ , then values  $n$  is

A. 16

B. 8.5

C. 4

D. 2.25

**Answer: D**



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2. A stone of mass  $m$  is tied to a string of length  $l$  rotating along a circular path with constant speed  $v$ . The torque on the stone is



A.  $mv^2l$

B.  $mv$

C.  $m\frac{v}{l}$

D. zero

**Answer: D**



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**3. At which temperature, the surface tension of water has a minimum value?**

A.  $4^{\circ} C$

B.  $10^{\circ} C$

C.  $27^{\circ} C$

D.  $37^{\circ} C$

**Answer: D**



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4. If the distance between any two bodies in the universe is reduced to half the present

distance between them, then attraction between them will

A. increase 4 times.

B. increase 2 times.

C. remain constant.

D. decrease by  $1/2$ .

**Answer: A**



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5. In a spring block system if length of the spring is reduced by 1 % , then time period

- A. increase by 2%.
- B. increase by 0.5%
- C. decrease by 2%.
- D. decrease by 0.5%.

**Answer: D**



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6. A  $5\mu F$  capacitor is fully charged across a 12 V battery, It is then disconnected from the battery and connected to an uncharged capacitor, If the voltage across the capacitor becomes 3 V then the capacitance of the

A.  $3\mu F$

B.  $15\mu F$

C.  $25\mu F$

D.  $60\mu F$

**Answer: B**





7. In Wheatstone's bridge  $P = 9\text{ohm}$ ,  $Q = 11\text{ohm}$ ,  $R = 4\text{ohm}$  and  $S = 6\text{ohm}$ . How much resistance must be put in parallel to the resistance  $S$  to balance the bridge

A. 24 ohm

B.  $\frac{44}{9}$  ohm

C. 26.4 ohm

D. 18.7 ohm

**Answer: C**



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8. A flywheel of mass 10 kg and radius 10 cm is revolving at a speed of 240 r.p.m. Its kinetic energy is

A.  $\frac{32}{\pi} J$

B.  $3.2\pi^2 J$

C.  $32\pi J$

D.  $32\pi^2 J$

**Answer: B**



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**9. Toroid is a solenoid of**

- A. infinite length.
- B. infinite length of non-uniform radius.
- C. finite length bent into a circle.
- D. infinite length bent into a circle.

**Answer: C**





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10. In a Young's double slit experiment, the slits are  $2\text{mm}$  apart and are illuminated with a mixture of two wavelength  $\lambda_0 = 750\text{nm}$  and  $\lambda = 900\text{nm}$ . The minimum distance from the common central bright fringe on a screen  $2\text{m}$  from the slits where a bright fringe from one interference pattern coincides with a bright fringe from the other is



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**11.** Select the correct statement . If a liquid surface is curved , then

A. the pressure on the concave side is less than that on the convex side.

B. the pressure on the concave side is equal to pressure on convex side.

C. the pressure on concave side is more than that on convex side.

D. the pressure on the concvex side is atmospheric pressure.

**Answer: C**



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**12.** A wheel is subjected to uniform angular acceleration about its axis. Initially, its angular velocity is zero. In the first 2sec, it rotates through an angle  $\theta_1$ , in the next 2sec, it

rotates through an angle  $\theta_2$ . The ratio of

$\theta_2 / \theta_1$  is

A. 1

B. 2

C. 3

D. 5

**Answer: C**



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13. A refrigerator with  $COP = 1/3$  release  $200J$  at heat to a reservoir. Then the work done on the working substance is

A.  $\frac{100}{3} J$

B.  $100J$

C.  $\frac{200}{3} J$

D.  $150J$

**Answer: D**



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14. In electromagnetic induction, the induced charge in a coil is independent of

A. change in the flux

B. time

C. resistance of the circuit

D. time and resistance of the circuit

**Answer: C**



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15. The capacitance of a parallel plate capacitor can be increased by

A. increasing the area of the plates.

B. decreasing the distances between the plates.

C. using a dielectric of higher permittivity.

D. all the above.

**Answer: D**



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**16.** In the determination of Young's modulus

$\left( Y = \frac{4MLg}{\pi d^2} \right)$  by using Searle's method, a

wire of length  $L = 180\text{cm}$  and a diameter  $d = 0.6$

mm is used. For a load  $M = 4\text{ kg}$ , an extension  $l =$

$0.2\text{ mm}$  in the length of the wire is observed.

Quantities  $d$  and  $l$  are measured using a

respectively. They have the same pitch of  $0.5$

mm. The number of divisions on their circular

scale is 100. The contributions to the

maximum probable error of the measurement

are



A. due to the errors in the measurements of  $d$  and  $l$  are the same.

B. due to the error in the measurement of  $d$  is 0.4% more than that due to the error in the measurement of  $l$ .

C. due to the error in the measurement of  $l$  is 0.83% more than that due to the error in the measurement of  $d$ .

D. due to the error in the measurement of  $d$  is four times that due to the error in

the measurement of  $I$ .

**Answer: C**

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**17.** The centre of mass of a right circular cone of height  $h$ , radius  $r$  and constant density  $\rho$  is at

A.  $\left(0, 0, \frac{h}{4}\right)$

B.  $\left(0, 0, \frac{h}{3}\right)$

C.  $\left(0, 0, \frac{h}{2}\right)$

D.  $\left(0, 0, \frac{h}{7}\right)$

**Answer: A**



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**18.** A horizontal wire carries 160 A current below which another wire of linear density  $16 \times 10^{-3} \frac{\text{kg}}{\text{m}}$  carrying a current is kept at 1.2 cm distance. If the wire kept below hangs in air, what is the current in this wire?

A. 58.8 A

B. 9.8 A

C. 98 A

D. 48 A

**Answer: A**



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**19.** A charge  $q$  is spread uniformly over an isolated ring of radius ' $R$ '. The ring is rotated about its natural axis and has magnetic dipole

moment of the ring as  $M$ . Angular velocity of rotation is

A.  $\frac{M}{2qR^2}$

B.  $\frac{M}{(qR)^2}$

C.  $\frac{2M}{qR^2}$

D.  $\frac{qM}{2R}$

**Answer: C**



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20. An object is placed at a distance  $u$  from a concave mirror and its real image is received on a screen placed at a distance of  $v$  from the mirror. If  $f$  is the focal length of the mirror, then the graph between  $1/v$  versus  $1/u$  is

A. 

B. 

C. 

D. 

**Answer: B**



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21. In forced vibration, the body vibrates with the

- A. same frequency of external force.
- B. different frequency of external force.
- C. exactly half of external force frequency.
- D. same and different frequencies of external force frequency.

**Answer: A**



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22. Light travels from a medium of refractive index  $\mu_1$ , to another of refractive index  $\mu_2$  ( $\mu_1 > \mu_2$ ). For total internal reflection of light, which is NOT true?

A. Light can travel from medium of refractive index  $\mu_1$  to  $\mu_2$ .



B. Angle of incidence must be greater than the critical angle.

C. There is no refraction of light.

D. Light can travel from the medium of refractive index  $\mu_1$  to  $\mu_1$ .

**Answer: D**



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23. Huygen's principle of secondary wavelets may be used to

- A. find the velocity of light in vacuum.
- B. explain the particle behaviour of light.
- C. find the new position of a wavefront.
- D. explain scattering of light

**Answer: C**



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24. The momentum of a photon of an electromagnetic radiation is  $3.3 \times 10^{-29}$  kg m/sec. What is the frequency of the associated waves ? [ $h = 6.6 \times 10^{-34}$  J-s]

A.  $1.5 \times 10^{13} \text{ Hz}$

B.  $7.5 \times 10^{12} \text{ Hz}$

C.  $6.0 \times 10^3 \text{ Hz}$

D.  $3.0 \times 10^3 \text{ Hz}$

**Answer: A**



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25. Two satellites of masses  $3m$  and  $m$  orbit the earth in circular orbits of radii  $r$  and  $3r$  respectively. The ratio of their speeds is

A. 1

B.  $\frac{1}{\sqrt{3}}$

C.  $\frac{1}{3}$

D.  $\frac{1}{2\sqrt{3}}$

**Answer: B**



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26. The reactance of a capacitance at 50 Hz is  $4\Omega$ . If the frequency is increased to 200 Hz, then the reactance is

A.  $16\Omega$

B.  $8\Omega$

C.  $2\Omega$

D.  $1\Omega$

**Answer: D**



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27. A steel ring of radius  $r$  and cross section area  $A$  is fitted on to a wooden disc of radius  $R$  ( $R > r$ ). If Young's modulus be  $Y$ , then the force with which the steel ring is expanded is

A.  $\frac{AYR}{r}$

B.  $\frac{AY(R - r)}{r}$

C.  $\frac{Y}{A} \frac{(R - r)}{r}$

D.  $\frac{Yr}{AR}$

**Answer: B**



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**28.** The second law of thermodynamics implies

A. whole of the heat can be converted into  
mechanical energy

B. no heat engine can be 100% efficient

C. every heat engine has an efficiency of  
100%

D. a refrigerator can reduce the lemgeritre  
to absolute zero,

**Answer: B**



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**29.** A  $1.00 \times 10^{-20} \text{ kg}$  particvle is performing S.H.M. with a period of  $1.00 \times 10^{-5} \text{ s}$  and with maximum velocity  $1.00 \times 10^3 \text{ m/s}$ . The maximum displacement from the mean position is



A. 10 mm

B. 1.59 mm

C. 1mm

D. 0.24mm

**Answer: B**



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**30.** In Davisson-Germer experiment, if the angle of diffraction is  $52^\circ$ , the find the glancing angle.

A.  $26^\circ$

B.  $64^\circ$

C.  $52^\circ$

D.  $104^\circ$

**Answer: B**



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**31.** The refractive index of the material of an equilateral prism is 1.3. The angle of minimum deviation due to the prism would be

A.  $30^\circ$

B. less than  $40^\circ$

C.  $45^\circ$

D. between  $30^\circ$  and  $60^\circ$

**Answer: B**



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**32.** If a particle executing S.H.M. with amplitude  $A$  and maximum velocity  $v_0$ , then its speed at displacement  $A/2$  is

A.  $\frac{\sqrt{3}}{2}v_0$

B.  $\frac{v_0}{2}$

C.  $v_0$

D.  $\frac{v_0}{\sqrt{2}}$

**Answer: A**



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**33.** Ionosphere is used for.....

A. Sky waves

B. space waves

C. ground waves

D. all

**Answer: A**



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**34.** Electric field intensity at a point due to an infinite sheet of charge having surface charge density  $\sigma$  is  $E$ . If sheet were conducting electric intensity would be

A.  $E/2$

B.  $E$

C.  $2E$

D.  $4E$

**Answer: C**



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**35.** The logic behind NOR gate is that it gives

A. high output when both the inputs are low.

B. low output when both the inputs are low.

C. high output when both the inputs are

D. Both (A) and (B).

**Answer: A**



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**36.** Ratio of the amplitudes of interfering waves is 4. Now the ratio of their intensities will be

A. 16:1

B. 49:1

C. 9:16

D. 3:4

**Answer: C**



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37. The U-tube with limbs of diameters 5 mm and 2 mm contains water of surface tension  $7 \times 10^{-2} Nm^{-1}$ . The angle of contact is zero and density  $10^3 kgm^{-3}$ . If  $g$  is  $10ms^{-2}$  then, the difference in levela in the twa limbs is

A. 8.4 cm

B. 8.4 cm

C. 8.4 m

D. 0.84 cm

**Answer: B**



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**38.** In above question, if the centripetal force  $F$  is kept constant but the angular velocity is doubled, the new radius of the path (original radius  $R$ ) will be

A.  $R/4$

B.  $R/2$

C.  $2R$

D.  $4R$

**Answer: A**



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**39.** The sine of the angle between

$\hat{i} + 3\hat{j} + 2\hat{k}$  and  $2\hat{i} - 2\hat{j} + 2\hat{k}$  is

A. 1

B. 0.91

C. 0.76

D. 0.67

**Answer: A**



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**40.** The instrument among the following which measures the e.m.f of a cell most accurately is

- A. a voltmeter
- B. an ammeter
- C. potentiometer
- D. post office box

**Answer: C**



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**41.** What is the shape of magnet in moving coil galvanometer to make the radial magnetic field ?

- A. Concave.
- B. Horse shoe magnet.
- C. Convex.
- D. Electromagnet.

**Answer: A**



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**42.** An electron cannot be occupied in

A. valence band

B. conduction band

C. forbidden band

D. all of these

**Answer: C**



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**43.** Beats are produced by the superimposition of two waves of nearly equal frequencies. Which of the following statements is CORRECT?

A. All particles of the medium vibrate simple harmonically with frequency equal to the difference between the frequencies of the component waves.

B. The frequency of beats changes with the location of the observer.

C. The frequency of beats changes with time.

D. Amplitude of vibration of particles at any point changes simple harmonically with frequency equal to one half of the the difference between component waves.

**Answer: D**



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44. Gyromagnetic ratio is a ratio of charge to

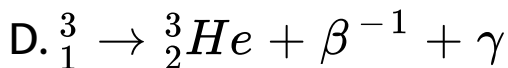
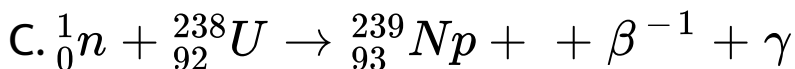
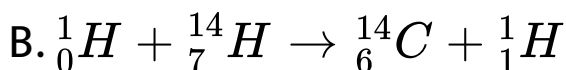
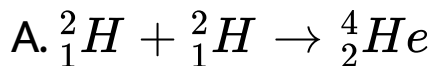
- A. magnetic moment of electron.
- B. electric dipole moment of electron.
- C. mass of electron.
- D. angular momentum of electron.

**Answer: C**



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45. Which of the following is the fusion reaction ?



**Answer: A**



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46. Light is incident at an angle  $i$  on a glass slab. The reflected ray is completely polarised. The angle of refraction is

A.  $90^\circ - i$

B.  $180^\circ - i$

C.  $90^\circ + i$

D.  $i$

**Answer: A**



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47. If the length of a closed organ pipe is 1m and velocity of sound is 330 m/s , then the frequency for the second note is

A.  $4(330/4)\text{Hz}$

B.  $3(330/4)\text{Hz}$

C.  $2(330/4)\text{Hz}$

D.  $5(330/4)\text{Hz}$

**Answer: B**



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