



# PHYSICS

## BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

### PRACTICE SET 06

#### Paper 1 Physics Chemistry

1. The time period of a simple pendulum is 2s. It its length is increased by 4 times, then its

period becomes

A. 16 s

B. 12 s

C. 8 s

D. 4 s

**Answer: D**



**Watch Video Solution**

2. If speed of a body and radius of it's circular path are double, centripetal force will become

A. double

B. 4 times

C. unchanged

D. half

**Answer: A**



**Watch Video Solution**

3. The weight of a body will be zero

A. at the centre of earth

B. in a freely falling chamber

C. in an artificial satellite

D. all of these

**Answer: D**



**Watch Video Solution**

4. A ray of light is incident at  $50^\circ$  on the middle of one of the two mirrors arranged at an angle of  $60^\circ$  between them. The ray then touches the second mirror, get reflected back to the first mirror, making an angle of incidence of

A.  $50^\circ$

B.  $60^\circ$

C.  $70^\circ$

D.  $90^\circ$

**Answer: C**



**Watch Video Solution**

5. A homogeneous disc of mass 2 kg and radius 15 cm is rotating about its axis with an angular velocity of 4 rad/s. the linear momentum of the disc is

A. 1.2 kg m/s

B. 1.0 kg m/s

C. 0.6 kg m/s

D. zero

**Answer: D**



**Watch Video Solution**

**6.** A tuning fork has natural frequency 256 Hz.

Which of the following frequencies will resonate it?

A. 300 Hz

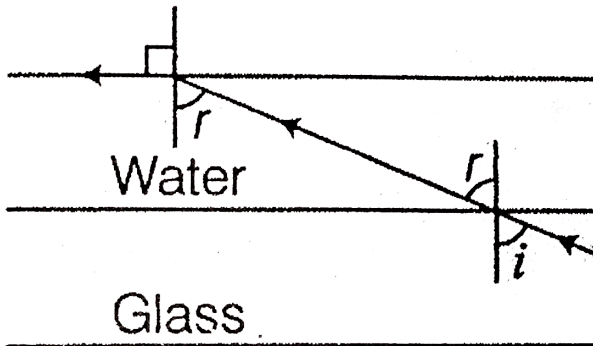
B. 230 Hz

C. 512 Hz

D. 1000 Hz

**Answer: C**

 [Watch Video Solution](#)



7.

A ray of light is incident at the glass-water



interface at an angle  $i$  it emerges finally parallel to the surface of water, then the value of  $\mu_g$  would be

A.  $(4/3)\sin i$

B.  $1/\sin i$

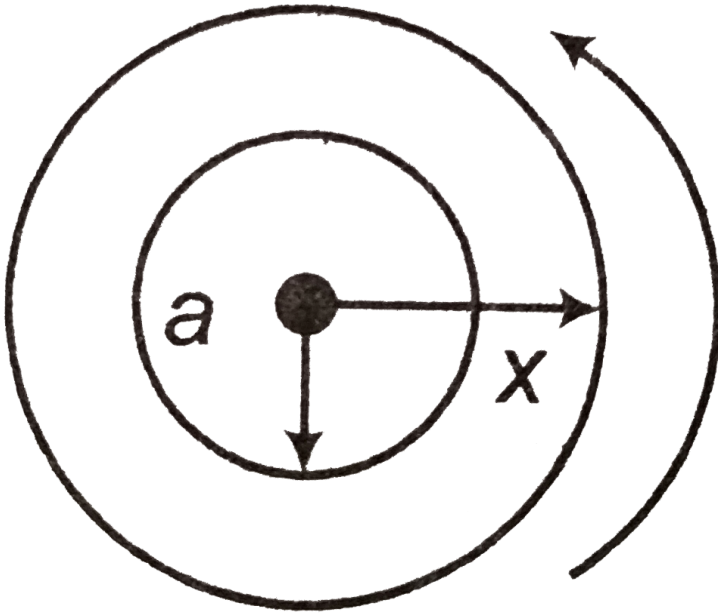
C.  $4/3$

D. 1

**Answer: B**



**Watch Video Solution**



8.

The radius of a planet is  $a$ . satellite revolves around it in a circle of radius  $x$  with angular velocity  $\omega$ . The acceleration due to the gravity on planet's surface is

A.  $\frac{\omega^2 x^3}{a^2}$

B.  $\frac{2\omega^2 x^3}{3a^2}$

C.  $\frac{\omega^2 x^2}{a}$

D.  $\frac{\omega^2 x^4}{2a^3}$

**Answer: A**



**Watch Video Solution**

**9.** The magnitude of force developed by raising temperature from  $0^\circ$  to  $100^\circ C$  of an iron bar 1.00 m long and  $1cm^2$  cross-sectional area ( $\alpha = 10^{-5} / .^\circ C$  and  $Y = 10^{11} N / m^2$ )

A.  $10^3 N$

B.  $10^4 N$

C.  $10^5 N$

D.  $10^9 N$

**Answer: B**



**Watch Video Solution**

**10.** Four wires of same material are stretched by the same load, which of them will elongate most?

A. Length 100 cm, diameter 1 mm

B. Length 200 cm, diameter 2 mm

C. Length 300 cm, diameter 3 mm

D. Length 400 cm, diameter 0.5 mm

**Answer: D**



**Watch Video Solution**

**11.** In a capillary tube water rises upto a certain height such that the upward force of surface tension balances the force of  $75 \times 10^{-4} N$ .

Due to weight of water, the internal circumference of capillary must be (ST of water  
 $= 6 \times 10^{-2} N/m$ )

A.  $1.25 \times 10^{-2} m$

B.  $0.50 \times 10^{-2} m$

C.  $6.5 \times 10^{-2} m$

D.  $12.5 \times 10^{-2} m$

**Answer: D**



**Watch Video Solution**

12. If two sources of frequencies 300 Hz and 303 Hz are sounded simultaneously, time interval between sounds of successive maximum intensity will be

A. 1 s

B. 3 s

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

D. 6 s

**Answer: C**



**Watch Video Solution**

13. A wooden ball of density  $D$  is immersed in water of density  $d$  to a depth  $h/2$  below the surface of water and then released. To what height will the ball jump out of water ?

A.  $\frac{d}{D}h$

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

C.  $h$

D. Zero

**Answer: B**





Watch Video Solution

14. Stationary waves are produced in 10 m long stretched string. If the string vibrates in 5 segments and wave velocity 20 m/s then the frequency is :-

A. 20 Hz

B. 5 Hz

C. 10 Hz

D. 15 Hz

**Answer: B**



**Watch Video Solution**

**15.** A particle is moving in the  $xy$ -plane with a constant velocity along a line parallel to the  $X$ -axis away from the origin. The magnitude of its angular momentum about the origin.

A. is zero

B. remains constant

C. goes on increasing

D. goes on decreasing

**Answer: B**



**Watch Video Solution**

**16.** In a Biprism experiment, the slit separation is 1mm. Using monochromatic light of wavelength  $5000 \text{ \AA}$ , an interference pattern is obtained on a screen. For changing the bond width by  $2.5 \times 10^{-5} \text{ m}$ .

- A. the screen is moved away from the slits  
by 10 cm
- B. the screen is moved towards the slits by  
10 cm
- C. the screen is moved away or towards the  
slits by 5 cm
- D. the screen is moved away or towards the  
slits by 10 cm

**Answer: C**



**Watch Video Solution**

17. The capacity of a condenser is  $4 \times 10^6$  farad and its potential is 100 volts. The energy released on discharging it fully will be

A. 0.02 J

B. 0.04 J

C. 0.025 J

D. 0.05 J

**Answer: A**



**Watch Video Solution**

18. Voltmeters  $V_1$  and  $V_2$  are connected in series across a *D. C.* line  $V_1$  reads 80 volts and has a per volt resistance of  $200\text{ohms}$ ,  $V_2$  has a total resistance of 32 kilo ohms.

The line voltage is

A. 120 V

B. 160 V

C. 220 V

D. 240 V

**Answer: D**



**Watch Video Solution**

**19.** The relation between internal energy  $U$ , pressure  $p$  and volume  $V$  of a gas in an adiabatic process is  $U = 2a + bpV$  where  $a$  and  $b$  are constants. What is the effective value of adiabatic constant  $\gamma$ ?

A.  $\frac{2b + 1}{2b}$

B.  $\frac{b + 1}{b}$

C.  $\frac{b^2 + 1}{b^2}$

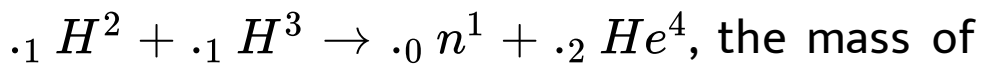
D.  $\left(\frac{b + 1}{b}\right)^2$

**Answer: B**



**Watch Video Solution**

**20.** Assuming that about  $20MeV$  of energy is released per fusion reaction



$.1 H^2$  consumed per day in a future fusion



reactor of powder  $1MW$  would be approximately

A. 0.001 g

B. 0.1 g

C. 10.0 g

D. 1000 g

**Answer: B**



**Watch Video Solution**

21. Sun and moon emit maximum radiant energy at wavelength  $5000 \text{ \AA}$  and  $15\mu$  respectively. If surface temperature of sun is  $6000 \text{ K}$ , then value of surface temperature of moon is

A.  $100 \text{ K}$

B.  $450 \text{ K}$

C.  $200 \text{ K}$

D.  $150 \text{ K}$

**Answer: C**



Watch Video Solution

22. Two bodies A and B emits radiant energy at the rate of  $1.6 \times 10^6 J/m^2/s$  and  $8.1 \times 10^6 J/m^2/s$  from its surface. If the temperature of A is  $227^\circ C$ , the temperature of B will be

A. 500 K

B. 400 K

C.  $524^\circ C$

D.  $477^{\circ}C$

**Answer: D**



**Watch Video Solution**

**23.** Radius of an air bubble at the bottom of the lake is  $r$  and it becomes  $2r$  when the air bubbles rises to the top surface of the lake. If  $P$  cm of water be the atmospheric pressure, then the depth of the lake is

A.  $2p$

B. 8p

C. 4p

D. 7p

**Answer: D**



**Watch Video Solution**

**24.** Total internal reflection takes place, when light travels from

A. water to glass

B. glass to diamond

C. water to air

D. air to mercury

**Answer: C**



**Watch Video Solution**

**25.** A band playing music at a frequency  $f$  is moving towards a wall at a speed  $v_b$ . A motorist is following the band with a speed  $v_m$ . If  $v$  is the speed of sound, obtain an

expression for the beat frequency heard by the motorist.

A.  $\frac{v + v_m}{v + v_0} f_0$

B.  $\frac{v + v_m}{v - v_0} f_0$

C.  $\frac{2v_b(v + v_m)}{v^2 - v_0^2} f$

D.  $\frac{2v_m(v + v_b)}{v^2 - v_m^2} f$

**Answer: A**



**Watch Video Solution**

26. An AC voltage source  $E = 200\sqrt{2}$ , is connected across AC ammeter and capacitor of capacitance  $1\mu F$ , the reading of ammeter is ( $\omega = rad/s$ )

A. 80 mA

B. 40 mA

C. 10 mA

D. 20 mA

**Answer: D**



Watch Video Solution



27. Widths of two slits in Young's experiment are in the ratio 4:1. What is the ratio of the amplitudes of light waves from them ?

A. 4:1

B. 1:4

C. 2:1

D. 1:2

**Answer: C**





**28.** A body of mass  $0.4\text{kg}$  starting at origin at  $t = 0$  with a speed of  $10\text{ms}^{-1}$  in the positive x-axis direction is subjected to a constant  $F = 8\text{ N}$  towards negative x-axis. The position of body after 25s is

A.  $-6000\text{m}$

B.  $-8000\text{m}$

C.  $4000\text{m}$

D.  $7000\text{m}$

**Answer: A**



**Watch Video Solution**

**29.** If the air column in a pipe which is closed at one end, is in resonance with a vibrating tuning fork at a frequency 60 Hz, then the length of the air column is (velocity of sound is 330m/s)

A. 35.7 cm

B. 31.7 cm

C. 12.5 cm

D. 62.5 cm

**Answer: B**



**Watch Video Solution**

**30.** A body of mass 5 kg starts from the origin with an initial velocity  $\bar{u} = (30\hat{i} + 40\hat{j})\text{ms}^{-1}$ . If a constant force  $(-6\hat{i} - 5\hat{j})\text{N}$  acts on the body, the time in which the y-component of the velocity becomes zero is.

A. 5 s

B. 20 s

C. 40 s

D. 80 s

**Answer: C**



**Watch Video Solution**

**31.** A spherical Gaussian surface encloses a charge of  $8.85 \times 10^{-8} C$  (i) Calculate the electric flux passing through the surface (ii) If

the radius of Gaussian surface is doubled, how would the flux change ?

A.  $10^4 Nm^2 / C$

B.  $10^3 Nm^2 / C$

C.  $10^2 Nm^2 / C$

D. zero

**Answer: A**



**Watch Video Solution**

**32.** The excess pressure inside mercury drop of diameter 4 mm is (Take surface tension of mercury is 0.465 N/m)

A. 410 Pa

B. 465 Pa

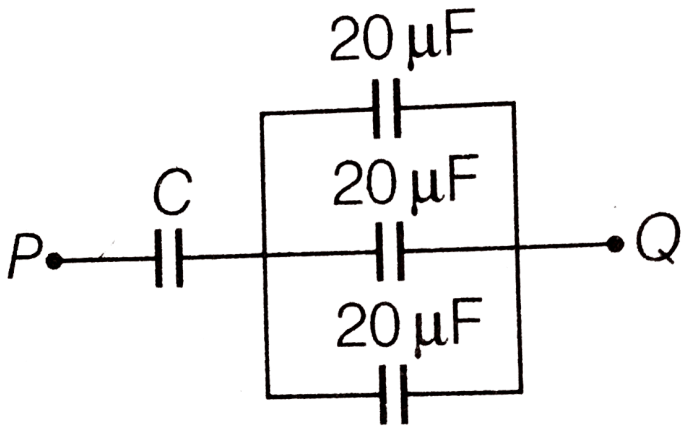
C. 610 Pa

D. 310 Pa

**Answer: B**



**Watch Video Solution**



33.

The equivalent capacitance of the combination shown in the figure between P and Q is  $30\ \mu\text{F}$ , the capacitance of capacitor C is

A.  $20\ \mu\text{F}$

B.  $30\ \mu\text{F}$

C.  $40\ \mu\text{F}$



D.  $60\mu F$

**Answer: D**



**Watch Video Solution**

**34.** The resistance of the shunt required to allow 2% of the main current through the galvanometer of resistance  $49\Omega$  is

A.  $1\Omega$

B.  $2\Omega$

C.  $0.2\Omega$

D.  $0.1\Omega$

**Answer: A**



**Watch Video Solution**

**35.** Density of a liquid in CGS system is

$0.625 \frac{g}{cm^3}$ . What is its magnitude in SI system?

A. 0.625

B. 0.0625

C. 0.00625

D. 625

**Answer: D**



**Watch Video Solution**

**36.** A difference of 2.3 eV separates two energy levels in an atom. What is the frequency of radiation emitted when the atom transits from the upper level to the lower level.

A.  $6.65 \times 10^{14} \text{ Hz}$

B.  $3.68 \times 10^{15} \text{ Hz}$

C.  $5.5 \times 10^{14} \text{ Hz}$

D.  $9.11 \times 10^{15} \text{ Hz}$

**Answer: C**



**Watch Video Solution**

**37.** A deuteron of kinetic energy 100 keV is describing a circular motion in a cyclotron having orbit of radius 0.5 m, in a plane

perpendicular to describes circular orbit in the cyclotron of radius 0.5 m in the same plane with the same magnetic field is

A. 200 keV

B. 50 keV

C. 100 keV

D. 25 keV

**Answer: A**



**Watch Video Solution**

**38.** A moving coil galvanometer has following characteristics. Number of turns of coil=80, Area of coil= $50\text{mm}^2$ , resistance of coil =  $20\Omega$ , flux density of radial field 0.2T, torsional constant of suspension wire =  $5 \times 10^{-9}\text{Nm/rad}$ . For this moving coil galvanometer, mark the correct statement(s).

- A. The angular deflection produced due to a potential difference of 0.01 mV is 0.08 div

B. Current sensitivity of the device is 160

div/mA

C. Voltage sensitivity of the device is 8

div/mV

D. all of the above

**Answer: D**



**Watch Video Solution**

39. Of the following transitions in a hydrogen atom, the one which gives an absorption line of highest frequency is

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

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

C.  $n=3$  to  $n=10$

D.  $n=10$  to  $n=3$

**Answer: A**



**Watch Video Solution**



40. Truth table given represent

<i>A</i>	<i>B</i>	<i>Y</i>
0	0	1
1	0	0
0	1	0
1	1	0

A. XOR gate

B. NOR gate

C. AND gate

D. OR gate

**Answer: B**



**Watch Video Solution**

**41.** Which one of the following represents the correct dimensions of the coefficient of viscosity?

A.  $[ML^{-1}T^{-2}]$

B.  $[MLT^{-1}]$

C.  $[ML^{-1}T^{-1}]$

D.  $[ML^{-2}T^{-2}]$

**Answer: C**



**Watch Video Solution**

**42.** If a rate of change of current of  $4 \text{ A s}^{-1}$  induces an emf of 20 mV in a solenoid, the self inductance of the solenoid is

A. 5 mH

B. 80 mH

C. 0.25 mH

D. zero

**Answer: A**



**Watch Video Solution**

**43.** The equation of a damped simple harmonic

motion is  $2m \frac{d^2x}{dt^2} + 2a_0 \frac{dx}{dt} + kx = 0$ . Then

the angular frequency of oscillation is

$$\text{A. } \omega = \left( \frac{k}{m} - \frac{a_0^2}{2m^2} \right)^{1/2}$$

$$\text{B. } \omega = \left( \frac{k}{m} - \frac{a_0}{4m} \right)^{1/2}$$

$$\text{C. } \omega = \left( \frac{k}{2m} - \frac{a_0^2}{4m^2} \right)^{1/2}$$

$$\text{D. } \omega = \left( \frac{k}{m} - \frac{a_0^2}{4m^2} \right)^{1/2}$$

**Answer: C**



**Watch Video Solution**

44. A spring (spring constant= $k$ ) is cuttend into 4 equal parts and two parts are connected in parallel. What is the effective spring constant?

A.  $4k$

B.  $16k$

C.  $8k$

D.  $6k$

**Answer: C**



Watch Video Solution

45. At what angle must the two forces  $(x + y)$  and  $(x - y)$  act so that the resultant may be

$$\sqrt{(x^2 + y^2)} :-$$

A.  $\cos^{-1} \left[ -\frac{(x^2 + y^2)}{2(x^2 - y^2)} \right]$

B.  $\cos^{-1} \left[ \frac{-2(x^2 - y^2)}{(x^2 + y^2)} \right]$

C.  $\cos^{-1} \left[ -\frac{(x^2 + y^2)}{(x^2 - y^2)} \right]$

D.  $\cos^{-1} \left[ -\frac{(x^2 - y^2)}{(x^2 + y^2)} \right]$

**Answer: A**



Watch Video Solution

46. Faraday's law are consequence of conservation

A. charge

B. energy

C. mass

D. angular momentum

**Answer: B**



Watch Video Solution



47. A body of mass 2 kg is kept by pressing to a vertical wall by a force of 100 N . The coefficient of friction between wall and body is 0.3. Then the frictional force is equal to

A. 6N

B. 20 N

C. 600N

D. 700N

**Answer: B**



**Watch Video Solution**

**48.** The threshold frequency of a material is  $2 \times 10^{14}$  Hz. What is its work function in eV ?

A. 0.8275 eV

B. 0.80 eV

C. 0.7325 eV

D. 0.9275 eV

**Answer: A**



**Watch Video Solution**

**49.** The susceptibility of magnetism at 300 K is  $1.2 \times 10^{-5}$  the temperature at which the susceptibility becomes  $1.44 \times 10^{-5}$  is

A. 200 keV

B. 240 K

C. 250 K

D. 0K

**Answer: C**



**Watch Video Solution**