

### Physics -Set 3

1) An object 4 cm high is placed 40 cm in front of a concave mirror of focal length 20 cm. Find the distance from the mirror, at which a screen can be placed to obtain a sharp image.

- a) 40 cm
- b) -40 cm
- c) 20 cm
- d) -20 cm

2) 1 KWH is unit of

- a) Time
- b) Power
- c) **Energy**
- d) Stress

3) Find the focal length and nature of lens which should be placed in contact with a lens of focal length 10 cm so that the power of the combination becomes 5 dioptre.

- a) 20 cm concave
- b) -20 cm concave
- c) 20 cm convex
- d) -20 cm convex

4) Name the physical quantities whose dimensional formula is  $M^1 L^2 T^{-2}$ ?

- a) Work
- b) momentum
- c) surface tension
- d) stress .

5) The vector perpendicular to is

- a) ,
- b) ,
- c) ,
- d)

6) Two bodies are projected at angles  $\theta$  and  $90 - \theta$  to the horizontal with the same speed. The ratio of their times of flight is

- a) 1: 1,
- b)  $\tan\theta : 1$ ,
- c)  $1: \tan\theta$ ,
- d)  $\tan^2\theta : 1$

7) A weight  $W$  rests on a rough horizontal plane of the angle of friction be  $\theta$ , the least force that will move the body along the plane will be

- (a)  $W \cos\theta$
- b)  $W \tan\theta$ ,
- c)  $W \cot\theta$ ,
- d)  $W \sin\theta$

8) For adiabatic process of an ideal gas the relation between  $T$  &  $V$  is

- a)  $TV = \text{constant}$ ,
- b)  $TV^{\gamma-1} = \text{constant}$ ,
- c)  $T^{\gamma-1} V = \text{constant}$ ,
- d)  $T^\gamma V^{\gamma-1} = \text{constant}$ .

9) When the distance between two charged particles is halved, the coulomb force between them becomes:

- a) One half,

- b) one fourth,
- c) double,
- d) four times.

10) The path difference between the two waves

$$Y_1 = a_1 \sin (wt - 2\pi x/\lambda) \text{ and}$$

$$Y_2 = a_2 \cos (wt - 2\pi x/\lambda + \theta) \text{ is}$$

- a)  $\lambda\theta/2\pi$ ,
- b)  $\lambda/2\pi(\theta + \pi/2)$
- c)  $2\pi/\lambda (\theta - \pi/2)$
- d)  $2\pi\theta/\lambda$

11) A diode as rectifier converts

- a) a.c. into d.c. ,
- b) d.c. into a.c.,
- c) Varying d.c. current into constant d.c. current,
- d) High voltage into low voltage and vice versa.

12) When two parallel wires carry currents in the same direction,

- (a) they attract each other
- (b) they repel each other
- (c) magnetic forces on two wires are perpendicular to each other
- (d) they do not experience any magnetic force.

13) An automobile travelling with a speed of 60 km/h, can brake to stop within a distance of 20 m. If the car is going twice as fast, i.e. 120 km/h, the stopping distance will be

- (a) 20 m
- (b) 40 m
- (c) 60 m
- (d) 80 m.

14) A marble block of mass 2 kg lying on ice when given a velocity of 6 m/s is stopped by friction in 10 s. Then the coefficient of friction is

- (a) 0.02
- (b) 0.03
- (c) 0.06
- (d) 0.01.

15) A uniform chain of length 2 m is kept on a table such that a length of 60 cm hangs freely from the edge of the table. The total mass of the chain is 4 kg. What is the work done in pulling the entire chain on the table?

- (a) 7.2 J
- (b) 3.6 J
- (c) 120 J
- (d) 1200 J.

16) The change in the value of  $g$  at a height  $h$  above the surface of the earth is the same as at a depth  $d$  below the surface of earth. When both  $d$  and  $h$  are much smaller than the radius of earth, then which of the following is correct?

- (a)  $d = 2h$

- (b)  $d = h$
- (c)  $d = h/2$
- (d)  $d = 3h/2$

17) A 20 cm long capillary tube is dipped in water. The water rises upto 8 cm. If the entire arrangement is put in a freely falling elevator, the length of water column in the capillary tube will be :

- (a) 8 cm
- (b) 10 cm
- (c) 4 cm
- (d) 20 cm

18) An  $\alpha$ -particle of energy 5 MeV is scattered through  $180^\circ$  by a fixed uranium nucleus. The distance of the closest approach is of the order of

- (a)  $1 \text{ \AA}^0$
- (b)  $10^{10} \text{ cm}$
- (c)  $10^{12} \text{ cm}$
- (d)  $10^{15} \text{ cm}$

19) The work function of a substance is 4.0 eV. The longest wavelength of light that can cause photoelectron emission from this substance is approximately :

- (a) 540 nm
- (b) 400 nm
- (c) 310 nm
- (d) 220 nm

20) The magnetic field due to a current carrying circular loop of radius 3 cm at a point on the axis at a distance of 4 cm from the centre is 54 pT. What will be its value at the centre of the loop ?

- (a) 250  $\mu\text{T}$
- (b) 150  $\mu\text{T}$
- (c) 125  $\mu\text{T}$
- (d) 75  $\mu\text{T}$

Answers

2. c  
3.b  
4.a  
5.d  
6.b  
7.d  
8.b  
9.d  
10.a  
11.a  
12.a  
13.d  
14.c  
15.b  
16.a  
17.d  
18.c  
19.c  
20.a