

NSIT- Sample Paper 1  
**PHYSICS**  
MEMORY BASED QUESTION

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1. Two balls of radius  $R$  and equal mass are placed in contact then the force of gravitation between them is proportional to

(a)  $F \propto \frac{1}{r^2}$                       (b)  $F \propto r$                       (c)  $F \propto r^4$                       (d)  $F \propto \frac{1}{r}$

**Sol: Ans [c]**

2. A bubble is at the bottom of the lake of depth =  $h$ . As the bubble comes to sea level, its radius increases three times. If atmospheric pressure is equal to  $l$  metre of water column. Then  $h$  is equal to

(a)  $26l$                       (b)  $l$                       (c)  $25l$                       (d)  $30l$

**Sol: Ans [a]**

3. Three charges  $1\mu\text{C}$ ,  $2\mu\text{C}$ ,  $3\mu\text{C}$  are kept at vertices of an equilateral triangle of side 1 m. If they are brought nearer so that they now form equilateral triangle of side 0.5 m, then work done is

(a) 11 J                      (b) 1.1 J                      (c) 0.011 J                      (d) 0.11 J

**Sol: Ans [c]**

4. The dimensions of Planck's constant is

(a)  $\text{M}^2\text{L}^2\text{T}^{-2}$                       (b)  $\text{MLT}^{-2}$                       (c)  $\text{ML}^2\text{T}^{-2}$                       (d)  $\text{ML}^2\text{T}^{-1}$

**Sol: Ans [d]**

5. Dimension of Bulk modulus is

(a)  $\text{M}^{-1}\text{LT}^{-2}$                       (b)  $\text{ML}^{-1}\text{T}^{-2}$                       (c)  $\text{ML}^{-2}\text{T}^{-2}$                       (d)  $\text{M}^2\text{L}^2\text{T}^{-2}$

**Sol: Ans [b]**

6. A high energy UV photon beam enters an electric field, it will be

(a) accelerated                      (b) retarded                      (c) undeflected                      (d) none of these

**Sol: Ans [c]**

7. A mass of 400 g and a mass of 100 g have same K.E., then the ratio of their momentum will be

(a) 2 : 1                      (b) 1 : 2                      (c) 1 : 3                      (d) 3 : 1

**Sol: Ans [a]**

8. Why is refractive index in a transparent medium greater than one ?

- (a) because the speed of light in vacuum is always less than speed in a transparent medium  
(b) because the speed of light in vacuum is always greater than speed in a transparent medium  
(c) frequency of wave changes when it crosses medium  
(d) none of these

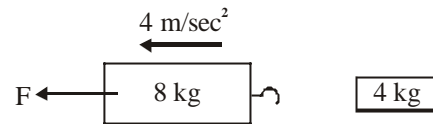
**Sol: Ans [b]**

9. If the length of tube is less and cannot accommodate the maximum rise of liquid then
- liquid will form fountain
  - liquid will not rise
  - the meniscus will adjust itself so that the water does not spill
  - none of these

**Sol: Ans [c]**

10. If the acceleration of 8 kg body is  $4 \text{ m/s}^2$  then acceleration of 4 kg body will be

- 40 m/sec
- 4 m/sec
- 4.2 m/sec
- 42 m/sec



**Sol: Ans [d]**

11. A ball is dropped from height 20 m. If coefficient of restitution is 0.9, what will be the height attained after first bounce

- 1.62 m
- 16.2 m
- 18 m
- 14 m

**Sol: Ans [b]**

12. In the phenomena of diffraction of light, when blue light is used in the experiment in spite of red light, then

- fringes will become narrower
- fringes will become broader
- no change in fringe width
- none of these

**Sol: Ans [a]**

13. Average power generated in an inductor connected to an AC source is

- $\frac{1}{2}Li^2$
- $L^2$
- zero
- none of these

**Sol: Ans [c]**

14. A disc is rolling on the inclined plane, what is the ratio of its rotational K.E. to the total K.E.

- 1 : 3
- 3 : 1
- 1 : 2
- 2 : 1

**Sol: Ans [a]**

15. Which is a non central force ?

- Electrostatic force
- Nuclear force
- Gravitational force
- None of these

**Sol: Ans [b]**

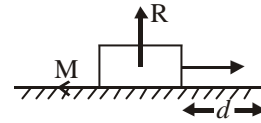
16. When the maximum K.E. of a simple pendulum is  $K$ , then what is its displacement (in terms of amplitude  $a$ ) when its K.E. is  $K/2$  ?

- $a/\sqrt{2}$
- $a/2$
- $a/\sqrt{3}$
- $a/3$

**Sol: Ans [a]**

17. If reaction is  $R$  and coefficient of friction is  $\mu$ , what is work done against friction in moving a body by distance  $d$ .

- (a)  $\frac{\mu R d}{4}$
- (b)  $2\mu R d$
- (c)  $\mu R d$
- (d)  $\frac{\mu R d}{2}$



Sol: Ans [c]

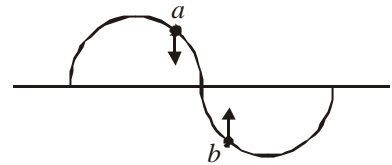
18. A glass slab ( $\mu = 1.5$ ) of thickness 6 cm is placed over a paper. What is the shift in the letters.

- (a) 4 cm
- (b) 2 cm
- (c) 1 cm
- (d) none of these

Sol: Ans [b]

19. Given above is the snapshot of a standing wave. What is the phase difference between  $a$  and  $b$ .

- (a)  $90^\circ$
- (b)  $180^\circ$
- (c)  $360^\circ$
- (d)  $0^\circ$



Sol: Ans [b]

20.  $n$ -type semiconductor is

- (a) positively charged
- (b) negatively charged
- (c) neutral
- (d) positive or negative depending upon doping material

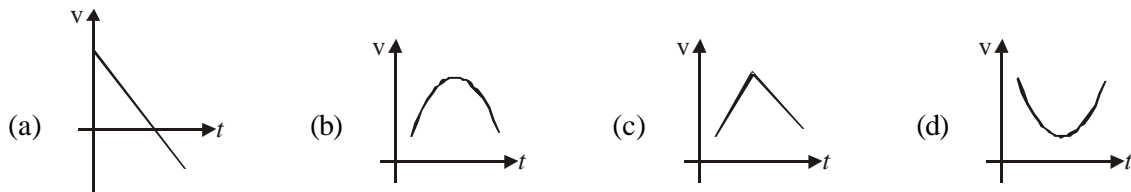
Sol: Ans [c]

21. Magnetic susceptibility of a diamagnetic substance

- (a) decreases with temperature
- (b) is not affected by temperature
- (c) increases with temperature
- (d) first increases then decreases with temperature

Sol: Ans [a]

22. A particle is thrown above then correct  $v-t$  graph is



Sol: Ans [a]

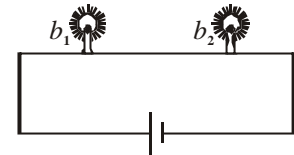
23. Two capacitors of capacitance  $C$  are connected in series. If one of them is filled with dielectric substance  $k$ , what is the effective capacitance ?

- (a)  $\frac{kC}{(1+k)}$                       (b)  $C(k+1)$                       (c)  $\frac{2kC}{1+k}$                       (d) none of these

Sol: Ans [a]

24. Bulb  $B_1$  is 100 W – 250 V and bulb  $B_2$  is 100 W – 200 V are connected across 250 V. What is potential drop across  $B_2$  ?

- (a) 200 V                      (b) 250 V  
(c) 98 V                      (d) 48 V



Sol: Ans [c]

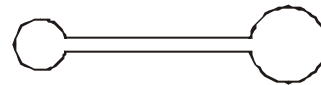
25. Energy stored in stretching a string per unit volume is

- (a)  $\frac{1}{2} \times \text{stress} \times \text{strain}$                       (b)  $\text{stress} \times \text{strain}$   
(c)  $\frac{1}{2} Y (\text{strain})^2$                       (d)  $\frac{1}{2} Y (\text{stress})^2$

Sol: Ans [a]

26. There is a small bubble at one end and bigger bubble at other end of a rod. What will happen ?

- (a) smaller will grow until they collapse  
(b) bigger will grow until they collapse  
(c) remain in equilibrium                      (d) none of these



Sol: Ans [b]

27. When the distance between earth and sun is halved, the duration of year will become

- (a) more                      (b) less                      (c) can't be determined (d) none of these

Sol: Ans [b]

28. If the earth stops rotating, the value of  $g$  at the equator

- (a) increases                      (b) decreases                      (c) no effect                      (d) none of these

Sol: Ans [a]

29. For a refrigerator, sink temperature 280 K, efficiency required is 50% that of Carnot's. What will be the temperature of source ?

- (a) 927 K                      (b) 1037 K                      (c) 1100 K                      (d) 1027 K

Sol: Ans [b]

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

- (a) 4 K                      (b) 16 K                      (c) 8 K                      (d) 6 K

Sol: Ans [c]

31. On a hilly region, water boils at  $95^{\circ}\text{C}$ . The temperature expressed in Fahrenheit is  
 (a)  $100^{\circ}\text{F}$  (b)  $20.3^{\circ}\text{F}$  (c)  $150^{\circ}\text{F}$  (d)  $203^{\circ}\text{F}$

**Sol: Ans [d]**

32. Energy of characteristic X Ray is a consequence of  
 (a) energy of projectile electron (b) thermal energy of target  
 (c) transition in target atoms (d) none of these

**Sol: Ans [c]**

33. A particle is projected at an angle  $45^{\circ}$ .  
 (a)  $R = 4H$  (b)  $4R = H$  (c)  $2H = R$  (d) none of these

**Sol: Ans [a]**

34. An antenna is of height 500 m. What will be its range (Radius of earth is 6400 km).  
 (a) 800 km (b) 100 km (c) 50 km (d) 80 km




**Sol: Ans [d]**

35. Temperature of two stars is in ratio 3 : 2. If wavelength of maximum intensity of first body is  $4000\text{ \AA}$  what is corresponding wavelength of second body ?  
 (a)  $9000\text{ \AA}$  (b)  $6000\text{ \AA}$  (c)  $2000\text{ \AA}$  (d)  $8000\text{ \AA}$

**Sol: Ans [b]**

36. Which frequency range is used for optical communication ?  
 (a) 300 MHz to 3GHz (b) 200 KHz to 3MHz (c) 30 GHz to 3MHz (d) None of these

**Sol: Ans [a]**

37. Which of the following is forward bias  
 (a)  (b)  (c)  (d) none of these

**Sol: Ans [c]**

38. For EM wave propagating along  $x$  axis has  $E_{\text{max}} = 30\text{ V/m}$ . What is maximum value of magnetic field?  
 (a)  $10^{-7}$  tesla (b)  $10^{-8}$  tesla (c)  $10^{-9}$  tesla (d)  $10^{-6}$  tesla

**Sol: Ans [d]**

39. Two diode having resistance  $20\ \Omega$  and is centretapped with potential difference 50 V. If external resistance is  $980\ \Omega$ , what is current through resistance ?  
 (a) 0.05 A (b) 0.025 A (c) 0.25 A (d) 0.5 A

**Sol: Ans [b]**

40. A light having wavelength 300 nm fall on metal surface. Work function of metal is 2.54 eV, what is stopping potential ?  
 (a) 2.3 V (b) 2.59 V (c) 1.59 V (d) 1.29 V

**Sol: Ans [c]**

41. One curie is equal to

- (a)  $3.7 \times 10^{10}$  disintegration/sec (b)  $3.2 \times 10^8$  disintegration/sec  
(c)  $2.8 \times 10^{10}$  disintegration/sec (d) none of these

**Sol: Ans [a]**

42. A steel ball is dropped in oil

- (a) ball attains constant velocity after some time (b) ball stops  
(c) speed of ball will keep on increasing (d) none of these

**Sol: Ans [a]**

43. A person is sitting in a lift accelerating upward. Measured weight of person will be

- (a) less than actual weight (b) equal to actual weight  
(c) more than actual weight (d) none of these

**Sol: Ans [c]**

44. Radius of one arm of hydraulic lift is four times of radius of other arm. What force should be applied on narrow arm to lift 100 kg.

- (a) 26.5 N (b) 62.5 N (c) 6.25 N (d) 8.3 N

**Sol: Ans [b]**

45. What is ratio of gravitational mass and inertial mass ?

- (a) 1 : g (b) g : 1 (c) 1 : 1 (d) g : G

**Sol: Ans [c]**

46. The wave front of a distant source of unknown shape is approximately

- (a) spherical (b) cylindrical (c) ellipsoid (d) plane

**Sol: Ans [d]**

47. For normal vision, what is distance of object from eye ?

- (a) 30 cm (b) 25 cm (c) infinite (d) 25 cm

**Sol: Ans [b]**

48. For compound microscope  $f_o = 1$  cm,  $f_e = 2.5$  cm, An object is placed at distance 1.2 cm from objective lens. What should be length of microscope for normal adjustment ?

- (a) 8.5 cm (b) 8.3 cm (c) 6.5 cm (d) 6.3 cm

**Sol: Ans [a]**

49. The gate for which output is high if at least one input is low ?

- (a) NAND (b) NOR (c) AND (d) OR

**Sol: Ans [a]**

50. Magnetic force required to demagnetize the material

- (a) retentivity (b) coercivity (c) energy loss (d) hysteresis

