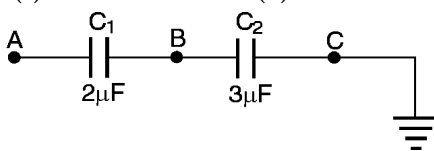


PHYSICS (Mock Test-1)

1. In Young's experiment, light of wavelength 6000\AA is used to produce fringes of width 0.8 mm at a distance of 2.5 m . If the whole apparatus is dipped in a liquid of refractive index 1.6 , the fringe width will be :
- (a) 0.2 mm (b) 0.4 mm
(c) 0.6 mm (d) 0.5 mm

2. In the given circuit, if point C is connected to the earth and a potential of $+2000\text{ V}$ is given to the point A , the potential at B is :
- (a) 400 V (b) 500 V
(c) 800 V (d) 1000 V

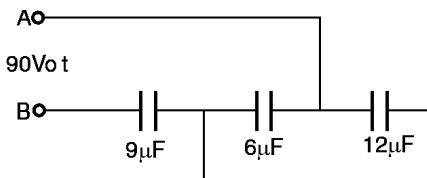


3. A double convex thin lens made of glass (refractive index $\mu = 1.5$) has both radii of curvature of magnitude 20 cm . Incident light rays parallel to the axis of lens will converge at a distance $d\text{ cm}$ such that :
- (a) $d = 20$ (b) $d = 40$
(c) $d = 10$ (d) $d = \frac{20}{3}$

4. Radius of curved road on national highway is R and width of the road is b . The outer edge of the road is raised by the height of h with respect to inner edge so that a car with velocity v can pass safe over it. The value of h is :
- (a) $\frac{v^2 R}{g}$ (b) $\frac{v^2 b}{R}$
(c) $\frac{v}{R g b}$ (d) $\frac{v^2 b}{R g}$

5. The magnetic flux associated with a closed loop is $\phi = 6t^2 + 7t + 1$, where ϕ is in milliweber and t in seconds. What will be the value of induced emf after 2 second ?
- (a) 29 mV
(b) 60 mV
(c) 31 mV
(d) 22 mV

6. The speed of an electromagnetic wave in vacuum is :
- (a) $c = \sqrt{\mu_0 \epsilon_0}$ (b) $c = \frac{1}{\sqrt{\mu_0 \epsilon_0}}$
 (c) $c = \sqrt{\frac{\mu_0}{\epsilon_0}}$ (d) $c = \sqrt{\frac{\epsilon_0}{\mu_0}}$
7. A 60 watt bulb carries a current 0.5 amp. The total charge passing through it in 1 hour is :
- (a) 1800 coulomb
 (b) 2400 coulomb
 (c) 3000 coulomb
 (d) 3600 coulomb
8. The direction of current in an iron-copper thermocouple is :
- (a) from copper to iron at cold junction
 (b) from iron to copper at hot junction
 (c) from copper to iron at hot junction
 (d) no current will flow
9. Two identical cells sends the same current in 2Ω resistance, whether connected in series or in parallel. The internal resistance of the cell should be :
- (a) 2.5Ω (b) $\frac{1}{2}\Omega$
 (c) 2Ω (d) 1Ω
10. A wire of resistance R is divided in 10 equal parts. These parts are connected in parallel, the equivalent resistance of such connection will be :
- (a) $0.01R$ (b) $0.1R$
 (c) $100R$ (d) $10R$
11. The work done in carrying a charge of $50\mu\text{C}$ from a point A to a point B in an electric field is 10 mJ. The potential difference ($V_B - V_A$) is :
- (a) -200V (b) $+200\text{V}$
 (c) -2kV (d) $+2\text{kV}$
12. The capacity of the capacitors are shown in adjoining figure. The equivalent capacitance between the points A and B and the charge on the $6\mu\text{F}$ capacitor will be :



- (a) $15\mu\text{F}, 90\mu\text{C}$ (b) $6\mu\text{F}, 180\mu\text{C}$
 (c) $15\mu\text{F}, 270\mu\text{C}$ (d) $27\mu\text{F}, 540\mu\text{C}$

20. Threshold wavelength for sodium is 5×10^{-7} m. Photoelectric emission occurs for light of :
- (a) any wavelength
 (b) wavelength above 6×10^{-7} m
 (c) wavelength below 5×10^{-7} m
 (d) all frequency below 5×10^{14} Hz
21. If the distance of the far point for a myopia patient is doubled, the focal length of the lens required to cure it will become :
- (a) double (b) half
 (c) three times (d) the same
22. Focal length of a convex lens will be maximum for :
- (a) red light (b) yellow light
 (c) green light (d) blue light
23. If yellow light in the Young's double slit experiment is replaced by red light, then the fringe width will :
- (a) increase
 (b) decrease
 (c) remain unaffected
 (d) first increase and then decrease
24. At a certain instant, a stationary transverse wave is found to have maximum kinetic energy. The appearance of string at that instant is :
- (a) sinusoidal shape with amplitude $\frac{A}{3}$
 (b) sinusoidal shape with amplitude $\frac{A}{2}$
 (c) sinusoidal shape with amplitude A
 (d) straight line
25. In Young's double slit experiment, if the square amplitudes of two superposing waves are in the ratio 1 : 9, then the ratio of the intensity at minima to that at maxima will be :
- (a) 1 : 3 (b) 1 : 4
 (c) 1 : 9 (d) 1 : 1
26. The equation of wave travelling in a string can be written as
- $$y = 3 \cos \pi(100t - x)$$
- Its wavelength is :
- (a) 2 cm (b) 5 cm
 (c) 100 cm (d) none of these

27. Intensity at any point due to interference of two waves will be maximum, when path difference at that point is :
- (a) $(2n+1)\frac{\lambda}{2}$ (b) $2n\lambda$
 (c) $n\lambda$ (d) $\lambda/2$
28. The displacement y of a particle executing periodical motion is given by
- $$y = 4 \cos^2(t/2) \sin(1000t)$$
- This expression may be considered to be a result of the superposition of how many independent harmonic motions :
- (a) 5 (b) 4
 (c) 3 (d) 2
29. One end of a copper rod of length 1.0 m and area of cross-section 10^{-3} m^2 is immersed in boiling water and the other end in ice. If the coefficient of thermal conductivity of copper is $92 \text{ cal/m-s } ^\circ\text{C}$ and the latent heat of ice is $8 \times 10^4 \text{ cal/kg}$, then the amount of ice which will melt in one minute, is :
- (a) $8 \times 10^{-3} \text{ kg}$ (b) $9.2 \times 10^{-3} \text{ kg}$
 (c) $5.4 \times 10^{-3} \text{ kg}$ (d) $6.9 \times 10^{-3} \text{ kg}$
30. Two samples A and B of a gas initially at the same temperature are compressed from volume V to $V/2$. (A isothermally and B adiabatically). The final pressure of A is :
- (a) twice the final pressure of B
 (b) less than the final pressure of B
 (c) equal to the final pressure of B
 (d) greater than the final pressure of B
31. Alcohol is more volatile than water because :
- (a) its boiling point is lower than water
 (b) it is an organic compound
 (c) its freezing point is lower than water
 (d) its vapour pressure is 2.5 times greater than water
32. The respective speeds of the molecules are 1, 2, 3, 4 and 5 km/sec. The ratio of their rms velocity and the average velocity will be :
- (a) 1 : 3 (b) 3 : 4
 (c) $3 : \sqrt{11}$ (d) $\sqrt{11} : 3$
33. If the number of molecules of H_2 are double than that of O_2 , then ratio of kinetic energy of hydrogen and that of oxygen at 300K, is :
- (a) 1 : 16 (b) 2 : 1
 (c) 1 : 1 (d) 1 : 2

34. If the surface tension of a liquid is T , the gain in surface energy for an increase in liquid surface by A , is :
- (a) A^2T^2 (b) A^2T
 (c) AT (d) AT^{-1}
35. The reason for the change in shape of a regular body is :
- (a) metallic strain (b) longitudinal strain
 (c) shearing strain (d) volume stress
36. The dimensions of four wires of the same material are given below. In which wire, the increase in length will be maximum :
- (a) length 50 cm, diameter 0.5 mm
 (b) length 300 cm, diameter 3 mm
 (c) length 200 cm, diameter 2 mm
 (d) length 100 cm, diameter 1 mm
37. What is the weight of a body at a distance $2r$ from the centre of the earth, if the gravitational potential energy of the body at a distance r from the centre of the earth is U ?
- (a) $\frac{U}{2r}$ (b) $\frac{U}{3r}$
 (c) $\frac{U}{4r}$ (d) Ur
38. Two particles of masses m_1 and m_2 initially at rest start moving towards each other under mutual force of attraction. The speed of the centre of mass at any time t when they are at a distance r apart, is :
- (a) $\left(G \frac{m_1 m_2}{r^2} \frac{1}{m_1 + m_2} \right) t$
 (b) $\left(G \frac{m_1 m_2}{r^2} \frac{1}{m_2} \right) t$
 (c) $\left(G \frac{m_1 m_2}{r^2} \frac{1}{m_1} \right) t$
 (d) Zero
39. Moment of inertia \times angular acceleration equal to :
- (a) work done
 (b) torque
 (c) angular momentum
 (d) force
40. If the K.E. of a body is increased by 300%, its momentum will increase by :
- (a) 175%
 (b) $\sqrt{300\%}$
 (c) 150%
 (d) 100%