Competitive Exams Physics Objective Questions Part 15

Q-1. A $5000\ \text{kg}$ rocket is set for vertical flaring. The exhaust speed is $800 m/s$. To give an initial upward acceleration of $20 m/s^2$, the amount of gas ejected per second to supply the needed thrust will be

a. 137.5 kg/sec

b. 185.5 kg/sec

c. 127.5 kg/sec

d. 187.5 kg/sec

Q-2. A body of mass $10\ \text{kg}$ and velocity $10 m/s$ collides with a stationary body of mass $5\ \text{kg}$. After collision both bodies stick to each other. velocity of the bodies after collision will be

a. $\frac{3}{10} m/s$

b. $\frac{18}{3} m/s$

c. $\frac{9}{20} m/s$

d. $\frac{20}{3} m/s$

Q-3 The earth $\left(\text{mass} = 6 \times 10^{24}\ \text{kg}\right)$ revolves around the sun with an angular velocity $2 \times 10^{-7} \frac{\text{rad}}{\text{sec}}$ in a circular orbit of radius $1.5 \times 10^{8}\ \text{km}$. The force exerted by sun on earth in newton is

a. 36×10^{21}

b. 18×10^{25}

c. 29×10^{39}

d. Zero

Q-4. A bread gives a boy of mass $40\ \text{kg}$ an energy of $21\ \text{kJ}$. If the efficiency is 28%, then height can be climbed by him using this energy, is

a. $22.5 m$

b. $15 m$

c. $10 m$

d. $5 m$

Q-5. At what height from the earth surface. The acceleration of gravity will be half the value of g at surface? $(R = 6400\ \text{km})$.

a. $6400\ \text{km}$

b. $4800\ \text{km}$

c. $8200\ \text{km}$

d. $1600\ \text{km}$

Q-6. If the gravitational force had varied as $r^{-\frac{5}{2}}$ instead of r^{-2}. The potential energy of a particle at a distance r from the centre of the earth would be proportional to

a. $(r_1 - r_2)^{\frac{3}{2}}$

b. $r^{-\frac{3}{2}}$

c. r^{-1}

d. r^{-2}

Q-7 A satellite of mass m is circulating around the earth with constant angular velocity. if the radius of the orbit is R_o and mass of the earth is M. The angular momentum about the centre of the earth momentum about the centre of the earth is

a. $M\sqrt{\frac{\mathrm{GM}}{R_o}}$

b. $M\sqrt{\frac{\mathrm{GM}}{R_o}}$

c. $m\sqrt{\mathrm{gmR}_o}$

d. $m\sqrt{\mathrm{GMR}_o}$

Q-8 A soap bubble has radius r and volume V. if the excess pressure inside the bubble is p. then PV is proportional to

a. r

b. r^2

c. r^3

d. r^{-1}

Q-9. If a body of mass $200g$ falls from a height $200m$ and its total potential enery is conserved into kinetic potential energy is conserved into kinetic energy, at the point of contact of the body with the surface, then decrease in potential energy of the surface, then decrease in potential energy of the body at the contact is $\left(g = 10m/s^2\right)$

a. 900 J

b. 600 J

c. 400 J

d. 200 J

Q-10. A particle is projected with $200m/s$ at an angle 60^o. At the highest point, it explodes into three particles of equal masses. One goes vertically upwards with velocity $100\frac{m}{s}$, second particle goes vertically downwards. Then the velocity of the third particle will be

a. $200m/s$

b. $300m/s$

c. $120\frac{m}{s}$ with 60^o angle

d. $200\frac{m}{s}$ with 30^o angle

Q-11. A cylinder of $500g$ and radius 10 cm has moment of inertia is (about its natural axis)

a. $3.5\ \mathrm{kgm}^2$

b. $5 \times 10^{-3}\ \text{kgm}^2$

c. $2 \times 10^{-3}\ \text{kg}\ m^2$

d. $2.5 \times 10^{-3}\ \text{kg}\ m^2$

Q-12 If a body starts from rest and travels 120 cm in the 8^{th} second. Then acceleration of the body is

a. $1.02 m/s^2$

b. $0.34 m/s^2$

c. $0.18 m/s^2$

d. $0.16 m/s^2$

Q-13 A ball is falling in a lake of depth $200m$ creates a ddecrease 0.1% in its volume at the bottom. The bilk modulus of the material of the ball will be

a. $19.6 \times 10^{-8}\ N/m^2$

b. $19.6 \times 10^{10}\ N/m^2$

c. $19.6 \times 10^{-10}\ N/m^2$

d. $19.6 \times 10^{2}\ N/m^2$

Q-14 Waterfalls from a height $500m$. The rise in temperature of water at bottom if whole of the energy remains in water, will be (specific heat of water $(c) = 4.2\ \text{kJ/kg}$)

a. $0.23^o C$

b. $1.16^o\ C$

c. $0.96^o\ C$

d. $1.02^o\ C$

Q-15 A cylindrical resonance tube, open at both ends, has a fundamental frequency f in air. if half of the length is dipped vertically in water. The fundamental frequency of the air column will be

a. $\frac{3f}{2}$

b. $2f$

c. f

d. $\frac{f}{2}$

Answer;

Q-16 A wave frequency $500\ \text{Hz}$ has a velocity of $350\frac{m}{s}$. The distance between two nearest points, if the wave is 60^o out of phase, will be approximately

a. $70\ \text{cm}$

b . $0.7m$

c. $12.0\ \text{cm}$

d. $120.0\ \text{cm}$

Q-17 If the momentum of a particle is double, then its de-Broglie wavelength will become

a. Remain unchanged

b. Four times

c. Two times

d. Half times

Q-18. A wave frequency 100 Hz is send along a string towards a fixed end. When this wave travels back, after reflection, a node is formed at a distance of 10 cm from the fixed end of the string. The speeds of incident (and reflected) waves are

a. $48 m/s$

b. $20 m/s$

c. $10 m/s$

d. $15 m/s$

Q-19. A source of sound is travelling with a velocity 40 km / hr towards an observer and emits sounds of frequency 2000 Hz . If velocity of sounds is 1220 km / hr , then apparent frequency heard by an observer is

a. 1980 Hz

b. 1950 Hz

c. 2068 Hz

d. 2080 Hz

Q-20. What is the dot product of two vectors of magnitude 3 and 5, if angle between them is 60^o ?

a. 5.2

b. 7.5

c. 8.4

d. 8.6

Q-21. Dimensions of torque are

a. $\left[M^2 L^2 T^2\right]$

b. $\left[\mathrm{ML}^2 T^{-2}\right]$

c. $\left[\mathrm{ML}^o T^{-1}\right]$

d. $\left[\mathrm{ML}^2 T^{-1}\right]$

Q-22. A glass rod of 20 cm long is clamped at the middle. it is set into the longitudinal vibration. if the emitted sound frequency is 4000 Hz , then velocity of sound in glass will be

a. $2800 m/s$

b. $3200 m/s$

c. $1600 m/s$

d. $2000 m/s$

Q-23. If the critical angle for total internal reflection from a medium to vacuum is 30^o. Then velocity of light in the medium is

a. $1.5 \times 10^8 \ m/s$

b. $2 \times 10^8 \ m/s$

c. $3 \times 10^8 \ m/s$

d. $0.75 \times 10^8 \ m/s$

Q-24. The mass of the planet is $\frac{1}{9}$th of the mass of the earth and its radius is half that of the radius of the earth. if a body weighs $450N$ on the earth, then what will be its weight on planet?

a. $150N$

b. $200N$

c. $400N$

d. $100N$

Q-25.16 g of oxygen at 37^oC is mixed with $14g$ of nitrogen at $27^o\ C$, the temperature of the mixture will be

a. $30.5^o\ C$

b. $37^o\ C$

c. $27^o\ C$

d. $32^o\ C$

Q-26. When there is not heat change from surrounding in a system, then the process is related with

a. isobaric

b. isochoric

c. isothermal

d. adiabatic

Q-27 If the ration of specific heat of a gas at constant pressure to that at constant volume is γ, the change in internal energy of the one mole of a gas when the volume changes from V to $2V$ at constant pressure P is

a. $\frac{\gamma \mathrm{PV}}{r-1}$

b. $\frac{\mathrm{PV}}{\gamma-1}$

c. $\frac{R}{\gamma-1}$

d. PV

Q-28. The original temperature of a black body is $270^o\ C$. The temperature to which that black body must be raised so as to double the total radiant energy, is

a. 917^oC

b. $1190^o\ C$

c. $1454^o\ C$

d. $2000K$

Q-29. A particle of mass m and charge q is placed at rest in a uniform electric field E and then released. The kinetic energy field E and then released. The kinetic energy attained by the particle after moving a distance y is

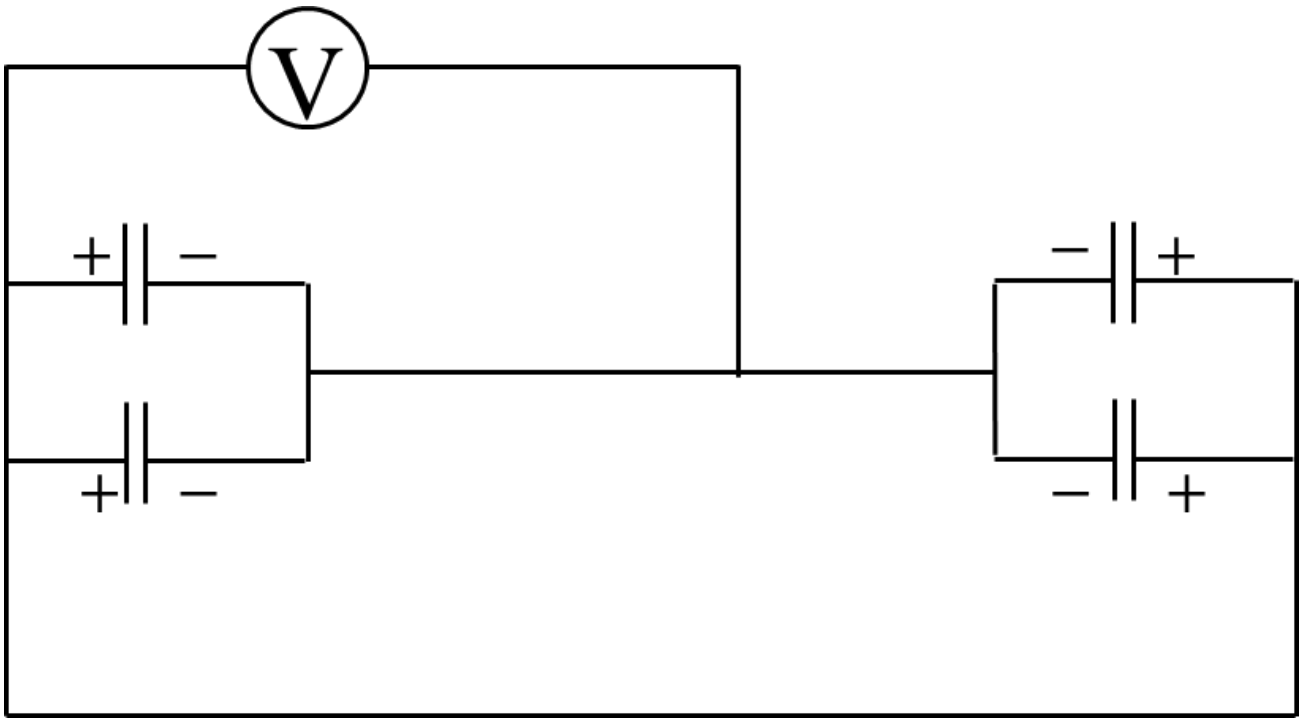
a. q^2 Ey

b. qEy

c. $\mathrm{qE}^2\ y$

d. qEy_2

Q-30. Four capacitors each of $25\mu F$ are connected as shown in diagram the DC voltmeter reads 200 volt . The charge on each plate of capacitor will be. .



a. $5 \times 10^{-2}\ C$

b. $2 \times 10^{-2} C$

c. $5 \times 10^{-3}\ C$

d. $2 \times 10^{-2}\ C$

Q-31. 10Ω electric heater operates on a $110V$ line, then the rate at which it develops heat in watts will be

a. 1210

b. 810

c. 670

d. 1310

Answer

Q-32. If the magnetic dipole is rotated through angle θ with respect to the direct of H. Then work done will be

a. $M\ H(1-\cos\theta)$

b. $M\ H\cos\theta$

c. $M\ H(1-\sin\theta)$

d. $M\ H\sin\theta$

Q-33. If a write of resistance 20Ω is covered with ice and a voltage of $210V$ is applied across the wire then rate of melting of ice will be

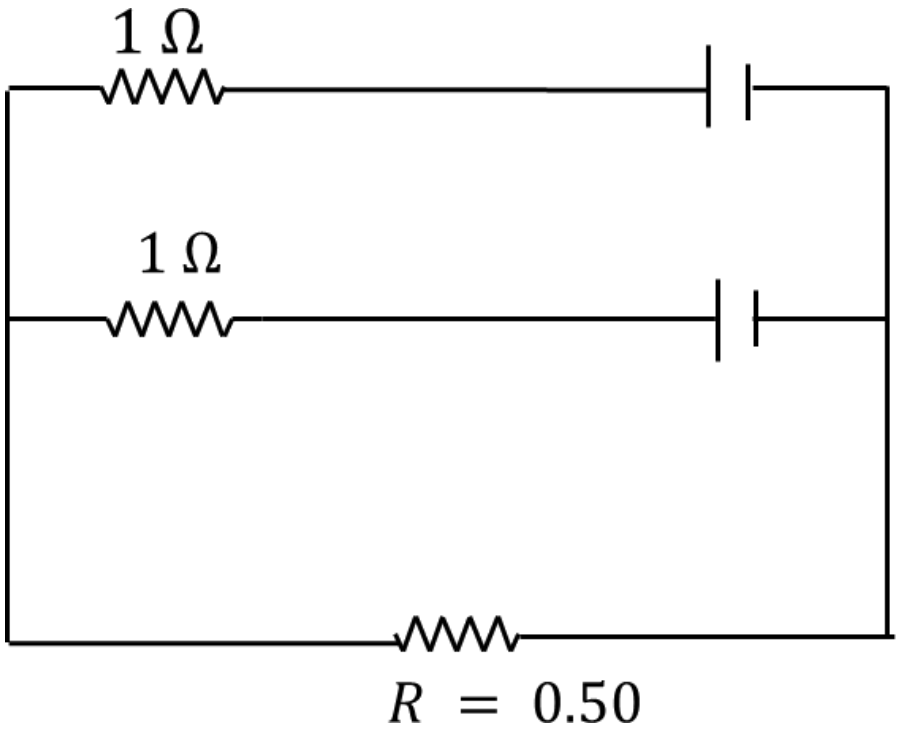
a. $6.56g/s$

b. $0.85g/s$

c. $6.56g/s$

d. none of these

Q-34. Two identical batteries, each of emf 2 volt and internal resistance $R=0.5\Omega$ by passing a current through it. The maximum power that can be developed across R using these batteries is



a. $3.2W$

b. $8.2W$

c. $2W$

d. $4W$

Q-35 The angle of minimum deviation for a thin prism with respect to air and when dipped in water will be $\left({}^{a}\mu_{g} = \frac{3}{2} {}^{a}\mu_{w} = \frac{4}{3}\right)$

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

b. $\frac{1}{4}$

c. $\frac{1}{2}$

d. $\frac{1}{8}$

Q-36 The velocity of an electronic in the inner most orbit of an atom is

a. highest

b. lowest

c. mean

d. Zero

Q-37. The diameter of the objective lenses of a telescope is $0.5m$ and wave length of light is $6000\mathring{A}$. The limit of resolution of this telescope is

a. 0.15 sec

b. 0.06 sec

c. 0.03 sec

d. 3.03 sec

Q-38. Light of wave length $5000\mathring{A}$ falls on a sensitive plate with photoelectric work function of 1.9 eV . The maximum kinetic energy of the photoelectron emitted will be

a. 1.16 eV

b. 2.38 eV

c. 0.58 eV

d. 2.98 eV

Q-39. The mass number of He is 4 and that of sulphur is 32. The radius of sulphur nucleus is larger than that of helium by a factor of

a. 2

b. 4

c. $\sqrt{8}$

d. 8

Q-40. A transistor has an $\alpha = 0.95$, it has change in emitter current of 100 milliampere, then the change in the collector current is

a. 95 mA

b. 99.05 mA

c. 100.95 mA

d. 100 mA

Frequently Asked Questions (FAQs)

MCQ for alternating current circuit

(- ha...@ on 25-Nov-2020)

1 Answer

You can visit Alternating Current MCQs. All the important questions including the numerical ones have been discussed.

- ha...@ on 25-Nov-2020