NEET-2020 Model Paper-3

Physics

1) A body of radius 'R' and mass 'm' is rolling horizontally without slipping with speed 'V'. It then rolled up a hill to a maximum height $h = \dfrac{3V^2}{4g}$, the body might be a
1. solid sphere
2. hollow sphere
3. ring
4. disc

2) A tennis ball bounces down a flight of stairs striking each step in turn and rebounding to the height of the step above. The coefficient of restitution is
1. $\dfrac{1}{2}$
2. $\dfrac{1}{\sqrt{2}}$
3. $\dfrac{1}{4}$
4. $\dfrac{1}{\sqrt{3}}$

3) A source of frequency 10 KHz when vibrated over the mouth of a closed organ pipe is in unison at 300 K. The beats produced when temperature rises by 1K is
1. 30 Hz
2. 13.33 Hz
3. 16.67 Hz
4. 40 Hz

4) An alternating voltage given by $V = 300\sqrt{2}\sin(50t)$ (in volts) is connected across a $1\mu F$ capacitor through A.C. ammeter. The reading of the ammeter will be
1. 10 mA
2. 15 mA
3. 40 mA
4. 100 mA

5) Arrange the following electromagnetic radiations per quantum in the order of increasing energy
A) Blue light   B) microwave
C) X-ray   D) Radiowave
1. C,B,A,D
2. A,B,D,C

3. D,B,A,C
4. B,C,D,A

6) The refractive index of prism is 2. This prism can have a maximum refracting angle of
1. 90^0
2. 30^0
3. 45^0
4. 60^0

7) A γ - ray photon is emitted
1. after ionization of an atom
2. due to conversion is a neutron into a proton to the nucleus
3. after de-excitation of a nucleus
4. due to conversion of a proton into a neutron in the nucleus

8) A square coil ABCD is lying in xy plane with its centre at origin. A long straight wire passing through origin carries a current $i = 2t$ in negative z – direction. The induced current in the coil is
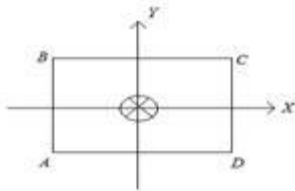
1. clockwise
2. anticlockwise
3. alternating
4. zero

9) A point moves in x-y plane according to the law $x = 4\sin 6t$ and $y = 4(1 - \cos 6t)$ The distance traversed by the particle in 4 second is (x and y are in metres)
1. 24 m
2. 48 m
3. 96 m
4. 108 m

10) A ball is thrown vertically upward . It has a speed of $10\,ms^{-1}$ when it has reached. One half of its maximum height. How high does the ball rise ? ($g = 10\,ms^{-2}$)
1. 5 m
2. 10 m
3. 20 m
4. 15 m

11) A magnetic needle lying parallel to a magnetic field requires 'w' unit of work to turn it through 60^0. The torque needed to maintain the needle in this position will be
1. $\sqrt{3}\,w$
2. w

3. $\left(\dfrac{\sqrt{3}}{2}\right)w$

4. 2 w

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12) The angular momentum (L) of earth revolving round the sun is proportional to r^n, where 'r' is the orbital radius of the earth. The value of 'n' is (assume the orbit to be circular)

1. $-\dfrac{1}{2}$

2. 1

3. $\dfrac{1}{2}$

4. 2

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13) If the charge of $10\,\mu c$ and $-2\,\mu c$ are given to two plates of a capacitor which are connected across a battery of 12 V, then the capacitance of the capacitor is

1. $0.5\,\mu F$

2. $0.41\,\mu F$

3. $0.33\,\mu F$

4. $0.6\,\mu F$

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14) The amplitude of a damped oscillator decreases to 0.9 times its original magnitude in 5 second. In another 10 second, it will decrease to 'α' times its original magnitude, where 'α' equals

1. 0.612

2. 0.729

3. 0.814

4. 0.394

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15) A rod of length 'l' is given two velocities V_1 and V_2 in opposite directions at its two ends at right angles to its length. The distance of the instantaneous axis of rotation from V_1 is

1. zero

2. $\dfrac{V_1}{(V_1+V_2)}l$

3. $\dfrac{V_2}{(V_1+V_2)}l$

4. $\dfrac{l}{2}$

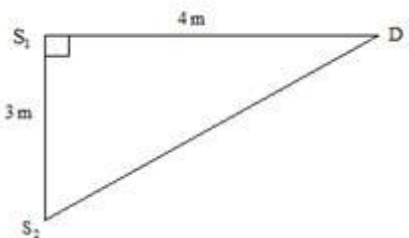16) The dimensions of $\left(\mu_0\,\epsilon_0\right)^{-1/2}$ is

1. $L^{-1}T$

2. LT^{-1}

3. $L^{-1/2}T^{1/2}$

4. $L^{1/2}T^{-1/2}$

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17) Force acting on a particle is $\left(2\hat{i}+3\hat{j}\right)N$. Work done by this force is zero, when a particle is moved on the line $3y+kx=5$. Here value of k is
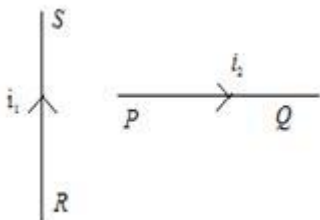
1. 2
2. 4
3. 6
4. 18

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18) In the figure the intensity of waves arriving at D from two coherent sources S_1 and S_2 is I_0. The wavelength of the wave is $\lambda=4m$. Resultant intensity at D will be

1. zero
2. $4I_0$
3. I_0
4. $2I_0$

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19) A current carrying wire PQ is placed near an another long current carrying wire RS. If free to move, wire PQ will have

1. translatory motion only
2. rotational motion only
3. translational as well as rotational motion
4. neither translational nor rotational motion

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20) The primary coil of a transformer has 100 turns and is connected to a 120 V AC source. How many turns are in the secondary coil if there is a 2400 V across it?

1. 5
2. 50

3. 200
4. 2000

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21) In young's double slit experiment the y-coordinates of central maximum and 10th maxima are 2 cm and 5 cm respectively. When the YDSE apparatus is immersed in a liquid of refractive index is 1.5 the corresponding Y co-ordinates will be
1. 2 cm, 7.5 cm
2. 3 cm, 6 cm
3. 2 cm, 4 cm
4. $\dfrac{4}{3}cm, \dfrac{10}{3}cm$

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22) In a single slit diffraction if we increase the slit width then the width of the central maxima
1. remains constant
2. increases
3. decreases
4. can't be predicted

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23) 121)A conducting sphere of radius 'R' is charged to a potential of V volts. Then the electric field at a distance $r(>R)$ from the centre of the sphere would be

1. $\dfrac{V}{r}$

2. $\dfrac{R^2 V}{r^3}$

3. $\dfrac{RV}{r^2}$

4. $\dfrac{rV}{R^2}$

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24) A dip circle is taken to geomagnetic equator. The needle is allowed to move in a vertical plane perpendicular to the magnetic meridian. The needle will stay
1. in horizontal direction only
2. in vertical direction only
3. in any direction except vertical and horizontal
4. in any direction it is released

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25) The truth table given below represents

INPUT	INPUT	OUTPUT
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

1. AND gate
2. OR gate

3. NAND gate
4. NOR gate

26) The threshold frequency for a metallic surface corresponds to an energy of 6.2 eV and the stopping potential for a radiation incident on this surface is 5V. The incident radiation lies in
1. Ultraviolet region
2. infrared region
3. visible region
4. x-ray region

27) The angular momentum of an electron in the hydrogen atom is $\frac{3h}{2\pi}$. Here 'h' is planck's constant. The kinetic energy of this electron is
1. 6.8 eV
2. 3.4 eV
3. 1.53 eV
4. 4.35 eV

28) In the circuit shown in figure, power developed across 1Ω, 2Ω and 3Ω resistances are in the ratio of
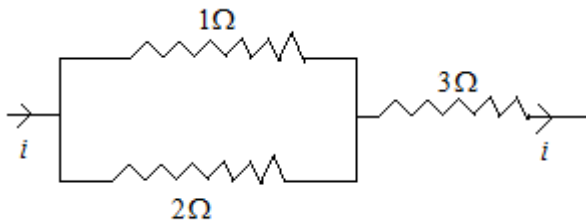
1. $1:2:3$
2. $4:2:27$
3. $6:4:9$
4. $2:1:27$

29) A ball suspended by a thread swings in a vertical plane so that its acceleration in the extreme position and lowest position are equal. The angle θ of thread deflection in the extreme position will be
1. $\tan^{-1}(2)$
2. $\tan^{-1}(\sqrt{2})$
3. $\tan^{-1}\left(\frac{1}{2}\right)$
4. $2\tan^{-1}\left(\frac{1}{2}\right)$

30) The length of a potentiometer is 'l'. A cell of emf 'E' is balanced at a length $\dfrac{l}{3}$ from the positive end of the wire. If the length of the wire is increased by $\dfrac{l}{2}$. At what distance will the same cell give a balance point

1. $\dfrac{2l}{3}$

2. $\dfrac{l}{2}$

3. $\dfrac{l}{6}$

4. $\dfrac{4l}{3}$

31) A charge 'q' is placed at the centre of line joining two equal charges 'Q'. The system of the three charges will be in equilibrium if 'q' is equal to

1. $-\dfrac{Q}{2}$

2. $-\dfrac{Q}{4}$

3. $+\dfrac{Q}{4}$

4. $+\dfrac{Q}{2}$

32) A police car moving at $22\,ms^{-1}$ chases a motorcyclist. The policeman sounds his horn at 176 Hz, while both of them move towards a stationary siren of frequency 165 Hz. Calculate the speed of the motorcycle. If it is given that the motor cyclist does not observe any beats ($V_{sound} = 330\,ms^{-1}$)

Police car   Motor cycle   Stationary Siren

→   → V 165 Hz

22 m /s,176 Hz
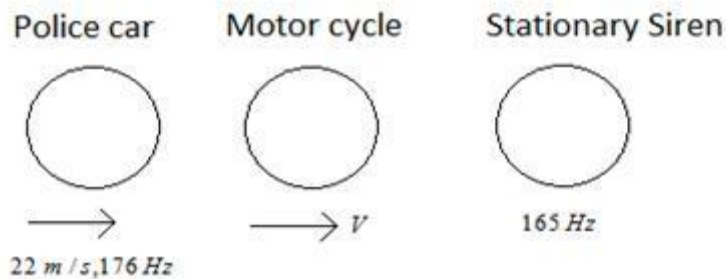
1. $22\,ms^{-1}$

2. $11\,ms^{-1}$

3. 0

4. $33\,ms^{-1}$

33) The potential energy of a particle of mass 1Kg is $U = 10+(x-2)^2$. Here 'U' is in joule and 'x' in metres. On the positive x-axis particle travels upto $x = +6m$. Choose the correct statement.
1. On negative x-axis particle travels upto $x = -2m$.
2. The maximum kinetic energy of the particle is 16 J
3. The period of oscillation of the particle is $\left(\sqrt{2}\right)\pi$ seconds
4. All the above

34) An ideal gas mixture filled inside a balloon expands according to the relation $PV^{2/3}$ = constant. The temperature inside the balloon is
1. increasing
2. decreasing
3. constant
4. cannot be defined

35) A block of mass 0.1 kg is held against a wall by applying a horizontal force of 5N on the block. If the coefficient of friction between the block and the wall is 0.5, the magnitude of frictional force acting on the block is
1. 0.98 N
2. 0.49 N
3. 2.5 N
4. 4.9 N

36) One plate of a capacitor is connected to a spring as shown in figure. Area of each plate is A. In steady state separation between the plates is 0.8 d (spring was unstretched and the distance between the plates was 'd' when the capacitor was uncharged). The force constant of the spring is approximately


E (in volt)
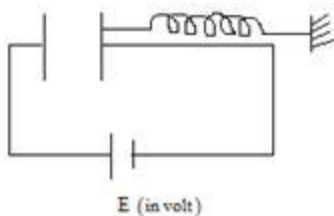
1. $\dfrac{\epsilon_0 AE^3}{2d^3}$

2. $\dfrac{2\epsilon_0 AE}{d^2}$

3. $\dfrac{4\epsilon_0 AE^2}{d^3}$

4. $\dfrac{6\epsilon_0 E^2}{Ad^3}$

37) A given quantity of an ideal gas is at pressure 'P' and absolute temperature 'T'. The isothermal bulk modulus of the gas is

1. $\dfrac{2}{3}P$

2. P

3. $\dfrac{3}{2}P$

4. 2 P

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38) Six identical conducting rods are joined as shown in figure. Points 'A' and 'B' are maintained at temperatures 200^0C and 20^0C respectively. The temperature of junction 'B' will be

1. 120^0C

2. 100^0C

3. 140^0C
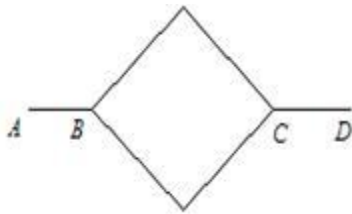
4. 80^0C

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39) The magnetic flux linked with a coil at any instant 't' is given by $\phi = 20t^2 - 30t - 150$ wb. The induced e.m.f. at $t=2$ second is

1. -10 V
2. -50 V
3. -75 V
4. -110 V

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40) If the distances of an object and virtual image from the focus of a convex lens of focal length 'f' are 1 cm each, then f is

1. 4 cm

2. $2\sqrt{2}$ cm

3. $\left(\sqrt{2}+1\right)$ cm

4. $\left(2+\sqrt{2}\right)$ cm

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41) A hole is drilled from the surface of earth to its centre. A particle is dropped from rest at the surface of earth. The speed of the particle when it reaches the centre of the earth interms of its escape velocity on the surface of earth V_e is

1. $\dfrac{V_e}{2}$

2. V_e

3. $\sqrt{2}V_e$

4. $\dfrac{V_e}{\sqrt{2}}$

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42) A charged particle enters a uniform magnetic field with velocity vector at an angle of 45^0 with the magnetic field. The pitch of the helical path followed by the particle is p. The radius of the helix will be

1. $\sqrt{2}P$

2. $\dfrac{\sqrt{2}P}{\pi}$

3. $\dfrac{P}{2\pi}$

4. $\dfrac{2P}{\pi}$

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43) If $_{92}U^{238}$ changes to $_{85}At^{210}$ by a series of α and β decays, the number of α and β decays undergone is

1. 7 & 5
2. 5 & 7
3. 7 & 7
4. 7 & 9

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44) A water proofing agent changes the angle of contact from

1. acute to 90^0

2. obtuse to 90^0

3. an acute to obtuse angle
4. an obtuse to an acute angle

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45) A solid shell loses half its weight in water. Relative density of shell is 5.0. What fraction of its volume is hollow?

1. $\dfrac{3}{5}$

2. $\dfrac{2}{5}$

3. $\dfrac{1}{5}$

4. $\dfrac{4}{5}$

NEET-3 Answers

Physics

1) 4 2) 2 3) 3 4) 2 5) 3 6) 4 7) 3 8) 4 9) 3 10) 2 11) 1 12) 3

13) 1 14) 2 15) 2 16) 2 17) 1 18) 4 19) 3 20) 4 21) 3 22) 3 23) 3 24) 4

25) 4 26) 1 27) 3 28) 2 29) 4 30) 2 31) 2 32) 1 33) 4 34) 1 35) 1 36) 3

37) 2 38) 3 39) 2 40) 3 41) 4 42) 3 43) 3 44) 3 45) 1