PHYSICS

BOOKS - TARGET PHYSICS (HINGLISH)

QUESTION PAPER 2019

Mcq

1. A student measures time for 20 oscillations of a simple pendulum as 30s, 32s, 35s and 31s. If the minimum division in the measuring clock is 1s, then correct meant time in second is

A. 32 ± 3

B. 32 ± 1

C. 32 ± 2

D. 32 ± 5

Answer: C

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2. The resultant of two vectors $\vec{A}$ and $\vec{B}$ is $\vec{C}$. If the megnitude of $\vec{B}$ is doubled, the new resultant vector becomes perpendicular to $\vec{A}$, then the magnitude of $\vec{C}$ is

A. 2B

B. B

C. 3B

D. 4B

Answer: B

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3. A parallelogram is fromed with $\vec{a}$ and $\vec{b}$ as the sides let $\vec{d}_1$ and $\vec{d}_2$ be the diagonals of the parallelogram , them $a^2 + b^2 =$

A. $\frac{\left(d_1^2 - d_2^2\right)}{2}$

B. $\frac{\left(d_1^2 + d_2^2\right)}{2}$

C. $\left(d_1^2 + d_2^2\right)$

D. $\left(d_1^2 - d_2^2\right)$

Answer: B

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4. The centre of mass of two particles system lies

A. at the midpoint on the line joining the two particles.

B. at one end of line joining the two particles

C. on the line perpendicular to the line joining two particles

D. on the line joining the two particles

Answer: D

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5. An aircraft is moving on a runway for its take off. The wind speed on the lower and upper surface of the wings are 'v' and $'\sqrt{2}'v$. If the density of air is ρ and surface area of the wing is A, the upward force exerted on thei wings will be

A. $\sqrt{2}\rho v^2 A$

B. $\frac{1}{\sqrt{2}}\rho v^2 A$

C. $2\rho v^2 A$

D. $\frac{1}{2}\rho v^2 A$

Answer: D

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6. The ray of light travels from raer medium to denser medium of refractive index μ. The angle of incidence of twice the angle of refraction. The angle of incidence is given by

A. $2\sin^{-1}\left(\frac{\mu}{2}\right)$

B. $2\cos^{-1}\left(\frac{2}{\mu}\right)$

C. $2\cos^{-1}\left(\frac{\mu}{2}\right)$

D. $\sin^{-1}\left(\frac{\mu}{2}\right)$

Answer: C

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7. For concave mirror, if the object is within the focal length, its image is

A. virtual, inverted and magnified

B. virtual, errect and magnified

C. virtual, erect and diminished.

D.

Answer: B

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8. If same current 'I' is flowing through two parallel wires, separted by the distance 'b' in air, then force acting per unit length of wires will be $(\mu_0 = \text{permeability of free space})$

A. $\frac{\mu_0 I^2}{2\pi b}$

B. $\frac{\mu_0 I^2}{4\pi b^2}$

C. $\frac{\mu_0 I^2}{\pi b^2}$

D. $\frac{\mu_0}{4\pi} \times \frac{I}{b^2}$

Answer: D

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9. At the magnetic north pole of the earth, the value of horizontal component of earth's magnetic field and angle of dip are, respectively

A. maximum,minimum

B. zero,maximum

C. maximum,maximum

D. minimum,minimum

Answer: B

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10. A straight wire carring current I is turned into a circular loop. If the magnitude of magnetic moment associated with it in M.K.S. unit is M, the length of wire will be

A. $\sqrt{\frac{4\pi I}{M}}$

B. $\sqrt{\frac{4\pi M}{I}}$

C. $\sqrt{4\pi IM}$

D. $\sqrt{\frac{\pi M}{4I}}$

Answer: B

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11. The angular separation between the minute hand and hour hand of a clock at 12.20pm is

A. 120°

B. 90°

C. 110°

D. 100°

Answer: C

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12. Which of the following statements is false? Centripetal force and centrifugal force

A. are equal in magnitude

B. constitute an action -reaction pair

C. remains constant

D. increases

Answer: B

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13. According to Kepler's Law, the areal velocity of the radius vector drawn from the Sun to any plant always.

A. decreases

B. first increases and then decreases

C. remains constant

D. increases

Answer: C

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14. A body mass 'm' is dropped from heinght $\frac{R}{2}$, from earth's surface, where 'R' is the radius of earth. Its speed when it will hit the earth's surface is $(v_e = \text{escape velocity from earth's surface})$.

A. $\sqrt{3}v_e$

B. $\frac{v_e}{\sqrt{3}}$

C. $\frac{v_e}{\sqrt{2}}$

D. $\sqrt{2}v_e$

Answer: B

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15. A ballet dancer spins about vertical axis at $1.5\pi rad/s$ with arms outstreched. With the arms folded, the moment on inertia about the same axis of rotation changes by 25%. The new frequency of roatation of is

A. 100 rpm

B. 60rpm

C. 150 rpm

D. 120 rpm

Answer: B

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16. When 'W' joule of work is done on a flywheel, its frequency of rotation increases from n_1. Hz to n_2. Hz The M.I. of the flywheel about its axis of rotation is given by

A. $\frac{W}{2\pi^2\left(n_2^2-n_1^2\right)}$

B. $\frac{W}{4\pi^2\left(n_2^2+n_1^2\right)}$

C. $\frac{W}{4\pi^2\left(n_2^2-n_1^2\right)}$

D. $\frac{W}{2\pi^2\left(n_2^2+n_1^2\right)}$

Answer: A

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17. A uniform cylinder has radius R and length L. If the moment of inertia of this cylinder about an axis passing through its centre and normal to its circular face is $\frac{mR^2}{2}$ is equal to moment of inertia of the same cylinder about an axis passing through its centre and normal to its length, then

A. L=3R

B. L=2R

C. $L=R\sqrt{2}$

D. $L=R\sqrt{3}$

Answer: D

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18. A massless spring, having force constant k, oscillates with frequency n when a mass m is suspended from it. The spring is cut into two equal halves and a mass $2m$ is suspended from one half. The frequency of oscillation will now be

A. $\frac{m}{\sqrt{2}}$

B. 2n

C. n

D. $n\sqrt{2}$

Answer: C

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19. A particle performs S.H.M. starting from extreme position. The phase change between two successive passages through the mean position is

A. $2\pi^c$

B. $\frac{\pi^c}{2}$

C. $\frac{\pi^c}{4}$

D. π^c

Answer: D

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20. A body is executing simple harmonic motion. At a displacement x its potential energy is E_1 and at a displacement y its potential energy is E_2 The potential energy E at displacement $(x+y)$ is

A. $P_1 + P_2$

B. $\sqrt{P_1^2 + P_2^2}$

C. $P_1 + P_2 + 2\sqrt{P_1 + P_2}$

D. $\sqrt{P_1 P_2}$

Answer: C

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21. A beam of metal supported at the two edges is loaded at the centre.

The depression at the centre is proportional to

A. Y

B. Y^2

C. $\frac{1}{Y^2}$

D. $\frac{1}{Y}$

Answer: D

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22. If the compressibility of water is σ per unit atmospheric pressure, then the decrease in volume V due to atmospheric pressure P will be

A. $\frac{\sigma V}{P}$

B. $\frac{\sigma P}{V}$

C. σPV

D. $\frac{\sigma}{PV}$

Answer: C

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23. The surface tension of soap solution is 0.035 N/m. The energy needed to increase the radius of bubble from 4cm to 6cm is $\left(\pi = \frac{22}{7}\right)$

A. $1.76 \times 10^{-5} J$

B. $1.76 \times 10^{-3} J$

C. $17.6 \times 10^{-3} J$

D. $17.6 \times 10^{-5} J$

Answer: B

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24. Which of the following is NOT true for the simple harmonic progressive wave represented by $y = 2\sin 2\pi\left(\frac{t}{0.01} - \frac{x}{50}\right)$ (where x and y are in cm and t in second)

A. Frequency of wave is 100Hz

B. Wavelength of wave in 50cm

C. Wave velocity is 2cm/s

D. Amplitude of wave is 2cm

Answer: C

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25. The vibration of a string of length 60cm fixed at both ends are represented by displacedment $y = 4\sin\left(\frac{\pi x}{15}\right)\cos(96\pi) where x \text{ and } y are \in cm \text{ and } t \in \sec ond. The part$ x=22.5 and t=0.25` is

A. zero

B. $4 \times 96 cms^{-1}$

C. $100 cms^{-1}$

D. $96 cms^{-1}$

Answer: A

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26. The air column in a pipe open at both ends vibrates with the frequency of third overtone. It is found that air in th pipe has

A. 4 nodes and 5 antinodes

B. 3 nodes and 3 antinodes

C. 4 nodes and 3 antinodes

D. 3 nodes and 4 antinodes

Answer: A

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27. A long tube open at the top is fixed verticallly and water level inside the tube can be moved up or down . A vibrating tuning fork is held above the open end and the water level is pushed down gradually so as to get first and second resonance at $24.1cm$ and $74.1cm$, respectively below the open end . The diameter of the tube is

A. 2 cm

B. 4 cm

C. 5 cm

D. 3 cm

Answer: D

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28. The values of coefficient of performance (α) and efficiency (η) of refrigerator are

A. $\alpha < 1, \eta = 2$

B. $\alpha > 1, \eta < 1$

C. $\alpha > 1, \eta = 1.5$

D. $\alpha < 1, \eta > 1$

Answer: B

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29. The ratio of rates of emission of heat by a black body at 367° at $207^\circ C$ is nealy

A. $1 : 0.567$

B. 1.77 :1

C. 3.16 :1

D. 1: 0.3.16

Answer: C

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30. According to corpuscular theory of light which is NOT the property of light?

A. The velocity of light in air is greater than in glass

B. Light travles in straight lines

C. The velocity of light does not change after reflection

D. The velocity of light changes after refraction.

Answer: A

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31. In Young's experiment the distance between the nth fringe on one side of centre of an interferene pattern and $(n+1)^{th}$ dark fringe on its other side will be

A. $\frac{2\lambda D}{d}$

B. $(4n+1)\frac{\lambda D}{d}$

C. $(4n+1)\frac{\lambda D}{2d}$

D. $\frac{\lambda D}{2d}$

Answer: C

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32. In Young's double slit experiment intensity at a point is $\left(\frac{1}{4}\right)$ of the maximum intersity. Angular position of this point is

A. $\sin^{-1}(\lambda/3d)$

B. $\sin^{-1}(\lambda/2d)$

C. $\sin^{-1}(\lambda/4d)$

D. $\sin^{-1}(\lambda/d)$

Answer: A

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33. A potential difference between plates of parrallel plate

A. $3 \times 10^{-3} J$

B. $4 \times 10^{-3} J$

C. $6 \times 10^{-3} J$

D. $5 \times 10^{-3} J$

Answer: A

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34. Volymeter can not be used to measure emf to a cell potentiometer can be used to measure emf of a cell because

A. potentiometer does not draw current from a cell

B. potentiameter draws current from a cell

C. voltmeter does not draw current from a cell

D. voltmeter is portable and compact.

Answer: A

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35. Modified Ampere's circuital law stated by Maxwell is (I=conduction current, $\in_0 = \frac{d\phi_E}{dt}$=displacement current, μ_0 and $\in_0$ is permeability and permittivity of free space)

A. $\in_0 . \mu_0 \left[I + \frac{d\phi_E}{dt} \right]$

B. $\mu_0\left[I+\ \in_0 .\ \frac{d\phi_E}{dt}\right]$

C. $\in_0\ \left[I+\mu_0.\ \frac{d\phi_E}{dt}\right]$

D. $\frac{\in_0}{\mu_0}\ \left[I+\frac{d\phi_E}{dt}\right]$

Answer: B

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36. A voltmeter has a resistance G and range V. Calculate the resistance to be used in series with it to extend its range to nV.

A. $\left(\frac{G}{n-1}\right)\omega$ in parallel

B. $\frac{G}{n-1}\omega$ in series

C. $G(n-1)\Omega$ in parallel$G(n-1)\Omega$ in series

D.

Answer: D

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37. A charge moves in a circle perpendicular to a magnetic field. The time period of revolution is independent of

A. mass of the particle

B. charge

C. magnetic field

D. velocity of the particle

Answer: D

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38. The magenetic susceptility of paramagnetic substance is 3×10^{-4}. It is placed in magnetising field of $4 \times 10^4 A/m$. The intensity of magnetisation will be

A. $12 \times 10^8 A/m$

B. $12A/m$

C. 24A/m

D. $3 \times 10^8 A/m$

Answer: B

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39. A coil of inductor'L' is connected to an a.c. source of emf E and frequency 'f'. The current in the coil is

A. $\frac{E}{\sqrt{2}\pi fL}$

B. $\frac{E}{2\pi fL}$

C. $\frac{E^2}{2\pi fL}$

D. $\frac{E}{2\pi fL^2}$

Answer: B

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40. When a light of wavelength 4000 Å falls on a photoelectric emitter, photoelectrons are liberated. For another emitter, light of wavelength 6000 Å is suficient for photo emission. The work functions of the two emitters are in the ratio of

A. $3:2$

B. $3:5$

C. $5:3$

D. $2:3$

Answer: A

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41. An electron of mass m and charge e is accelerated from rest through a potential difference V in vacuum. The final speed of the electron will be

A. $\sqrt{\frac{eV}{m}}$

B. $\sqrt{\frac{eV}{2m}}$

C. $\sqrt{\frac{4eV}{m}}$

D. $\sqrt{\frac{2eV}{m}}$

Answer: D

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42. In the Bohr model of the hydrogen atom, let R, v and E represent the radius of the orbit, the speed of electron and the total energy of the electron respectively. Which of the following quantity is proportional to the equantum number n

A. $\frac{V}{R}$

B. RV

C. EVR^2

D. $\frac{R}{V}$

Answer: B

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43. In radioactive transformation, Uranimum $^{238}_{92}U$ emits $2\alpha \text{ and } 2\beta$ and gets converted into Thorium (Th). The atomic number and mass number will be

A. 86 and 232

B. 90 and 234

C. 90 amd 230

D. 90 and 232

Answer: C

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44. A $n-p-n$ transistor conducts when

A. both collector and emitter are positive with respect to the base

B. both collector and emitter are negative with respect to the base

C. collector is positive and emitter is negative with respect to the base

D. collector is positive and emitter is at same potential as the base

Answer: C

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45. The ozone layer of the atmosphere blocks

A. only radio waves

B. only $\gamma - \text{rays}$

C. only visible light

D. large amount of ultraviolet radiations

Answer: D

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