PHYSICS

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

MHTCET 2015

Physics

1. In the expression for boyle 's law the product pV has dimensions of

A. force

B. impluse

C. energy

D. momentum

Answer: b

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2. What is the angular velocity of a second hand and minute hand of a clock ?

A. $\frac{59\pi}{900} ra \frac{d}{s}$

B. $\frac{59\pi}{1800} ra \frac{d}{s}$

C. $\frac{59\pi}{2400} ra \frac{d}{s}$

D. $\frac{59\pi}{3600} ra \frac{d}{s}$

Answer: b

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3. A metallic rod of length $'L'$ and cross-section $'A'$ has Young's modulus $'Y'$ and coefficient of linear expansion $'\alpha'$. If the rod

is heated to a temperature. 'T`` the energy stored per unit volume is:

A. $\frac{Ya\alpha Lt^2}{2}$

B. $\frac{Ya\alpha^2 Lt^2}{2}$

C. $\frac{Ya\alpha^2 L^2 t^2}{2}$

D. $\frac{Ya\alpha Lt}{2}$

Answer: d

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4. In a sonometer experiment the bridges are separted by a fixed distance the wire which is slightly elastic emits a tone of frequency n when held by tension T If the tension is increased to 4T the tone emitted by the wire will be of frequency

A. n

B. 2n

C. slightly greater than 2n

D. slightly less than 2n

Answer: d

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5. A particle executes S.H.M. of amplitude 25 cm and time period 3 s. What is the minimum time required for the particle to move between two points 12.5 cm on either side of the mean position ?

A. 0.6 s

B. 0.5 s

C. 0.4 s

D. 0.2 s

Answer: d

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6. The Pitch of the whistle of an engine appears to drop to $\frac{5}{6}$ th of original value when it passes a stationary observer if the speed of sound in air is 350 m/s then the speed of engine is

A. 35 m/s

B. 70 m/s

C. 105 m/s

D. 140 m/s

Answer: a

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7. A solid cylinder has mass M radius R and length / its moment of inertia about an axis

passing through its centre and perpendicular to its own axis is

A. $\frac{2MR^2}{3} + \frac{MI^2}{12}$

B. $\frac{MR^2}{3} + \frac{MI^2}{12}$

C. $\frac{3MR^2}{3} + \frac{MI^2}{12}$

D. $\frac{MR^2}{4} + \frac{MI^2}{12}$

Answer: D

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8. A particle is executing SHM of periodic time T the time taken by a particle in moving from mean position to half the maximum displacement is $(\sin 30^\circ = 0.5)$

A. $\frac{T}{2}$

B. $\frac{T}{4}$

C. $\frac{T}{8}$

D. $\frac{T}{12}$

Answer: d

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9. The dimensions of stefan 's constant are

A. $\left[M^0LT^{-3}K^{-4}\right]$

B. $\left[MLT^{-3}K^{-3}\right]$

C. $\left[ML^2T^{-3}K^{-4}\right]$

D. $\left[ML^0T^{-3}K^{-4}\right]$

Answer: a

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10. An open and closed organ pipe have the same length the ratio pth mode of frequency of vibration of air in two pipe is

A. $P(2p+1)$

B. $\frac{2p}{2p-1}$

C. p

D. 1

Answer: c

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11. A cord is wound round the circumference of wheel of radius r. The axis of the wheel is horizontal and fixed and moment of inertia about it is I. A weight mg is attached to the end of the cord and falls from rest. After falling through a distance h, the angular velocity of the wheel will be.

A. $[mgh]^{1/2}$

B. $\left[\frac{2mgh}{I+2mr^2}\right]^{1/2}$

C. $\left[\frac{2mgh}{I+mr^2}\right]^{1/2}$

D. $\left[\frac{mgh}{I+2mr^2}\right]^{1/2}$

Answer: b

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12. Toy cart tied to the end of an unstretched string of length a, when revolved moves in a horizontal circle of radius 2a with a time period T. Now the toy cart is speeded up until it moves in a horizontal circle of radius 3a with a period T. If Hooke's law (F=kx) holds, then

A. $T_1 = (2)\sqrt{3}T$

B. $T_1 = \frac{\sqrt{3}}{2}T$

C. $T_1 = \frac{\sqrt{2}}{3}T$

D. $T_1 = \frac{\sqrt{3}}{2}T$

Answer: d

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13. In a pipe opened at both ends n_1 and n_2 be the frequencies corresponding to vibrating

lengths L_1 and L_2 respectively .The end correction is

A. $\frac{n_1 I_2 - n_2 I_2}{2(n_1 - n_2)}$

B. $\frac{n_2 I_2 - n_1 I_1}{2(n_2 - n_1)}$

C. $\frac{n_2 I_2 - n_1 I_1}{2(n_1 - n_2)}$

D. $\frac{n_2 I_2 - n_1 I_1}{n_1 - n_2}$

Answer: d

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14. A mass is suspended from a spring have spring constant k is displaced veritcally and relased it oscillates with period T the weight of the mass suspended is (g= gravitatioanal acceleration)

A. $\frac{kTg}{4\pi^2}$

B. $\frac{kT^2g}{4\pi^2}$

C. $\frac{kTg}{2\pi^2}$

D. $\frac{kT^2g}{2\pi^2}$

Answer: c

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15. A satellite of mass m is in a circular orbit of radius r round the Earth. Calculate its angular momentum with respect to the centre of the orbit in terms of the mass M of the Earth and G.

A. $(GMmr)^{1/2}$

B. $\left(GM^2mr\right)^{1/2}$

C. $\left(GMm^2r^2\right)^{1/2}$

D. $\left(GM^2m^2r\right)^{1/2}$

Answer: b

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16. A liquid rises to a height of 1.8 cm in a glass capillary A another glass capillary B having diameter 90% of capillary A is immersed in the same liquid the rise of liquid in capillary B is

A. 1.4 cm

B. 1.8 cm

C. 2.0 cm

D. 2.2 cm

Answer: a

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17. A particle of mass m is moving in a circular path of constant radius r such that its centripetal acceleration a_c is varying with time t as $a_c = k^2rt^2$, where k is a constant. The

power delivered to the particle by the forces acting on it is :

A. $m^2k^2r^2t^2$

B. mk^2r^2t

C. mk^2rt^2

D. mkr^2t

Answer: b

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18. A simple pendulum is oscillating with amplitue A and angular frequency ω At ratio of kinetic energy to potential energy is

A. $\frac{x^2}{A^2 - x^2}$

B. $\frac{X^2 - a^2}{x^2}$

C. $\frac{A^2 - x^2}{x^2}$

D. $\frac{A - x}{x}$

Answer: a

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19. The equation of the progressive wave is y =a $\sin\pi\left(nt-\frac{x}{5}\right)$ the ratio maximum paritcle velocity to wave velocity is

A. $\frac{\pi a}{5}$

B. $\frac{2\pi a}{5}$

C. $\frac{3\pi a}{5}$

D. $\frac{4\pi a}{5}$

Answer: A

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20. Let the acceleration due to gravity be g_1 at a height h above the earth's surface g_2 at a depth d below the earth's surface. If $g_1 = g_2, h < < R$ and $d < < R$ then

A. d=h

B. $d = \frac{h}{2}$

C. $d = \frac{h}{4}$

D. d=2h

Answer: a

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21. A rope 1 cm in diameter breaks if the tension in it exceeds 500 N. The maximum tension that any be given to a similar rope of diameter 2 cm is

A. 2000 N

B. 1000 N

C. 500 N

D. 250 N

Answer: a

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22. The length and diameter of a metal wire is doubled the fundamental frequency of vibration will change from n to (tension being kept constant and material of both the wires is same)

A. $\frac{n}{4}$

B. $\frac{n}{8}$

C. $\frac{n}{12}$

D. $\frac{n}{16}$

Answer: a

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23. A hollow spere of mass M and radius R is rotating with angular frequency ω it suddenly stops rotating and 75% of kinetic energy is converted to heat if s is the speicific heat of the material in j / kg k then rise in

temperature of the spere is (MI of hollow sphere $= \frac{2}{3}MR^2$

A. $\frac{R\omega}{4s}$

B. $\frac{R^2\omega^2}{4s}$

C. $\frac{R\omega}{2s}$

D. $\frac{R^2\omega^2}{2s}$

Answer: b

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24. A large number of liquid drops each of radius 'a' coalesce to form a single spherical drop of radish b. The energy released in the process is converted into kinetic energy of the big drops formed. The speed of big drop will be

A. $\left[\frac{6T}{\rho}\left(\frac{1}{a}-\frac{1}{b}\right)\right]^{1/2}$

B. $\left[\frac{6T}{\rho}\left(\frac{1}{b}-\frac{1}{a}\right)\right]^{1/2}$

C. $\left[\frac{\rho}{6T}\left(\frac{1}{a}-\frac{1}{b}\right)\right]^{1/2}$

D. $\left[\frac{\rho}{6T}\left(\frac{1}{b}-\frac{1}{a}\right)\right]^{-1/2}$

Answer: a

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25. A black body radiates heat at temperatures T_1 and $T_2(T_2 > T_1$ the frequency corresponding to maxium energy is

A. more atT_1

B. more at T_2

C. equal for T_1 and T_2

D. independent of T_1 and T_2

Answer: b

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26. For dimgnetic materials magnetic susceptibility is

A. large and negative

B. small and positive

C. small and negative

D. large and positive

Answer: c

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27. For balmer series wavelength of first line is λ_1 and for brackett series wavelength of first line is λ_2 then $\frac{\lambda_1}{\lambda_2}$ is

A. 0.81

B. 0.162

C. 0.198

D. 0.238

Answer: c

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28. The distances of a point on the screen from two slits in biprism experiment is 1.8×10^5 m and 1.23×10^5 m if wavelength of light used is 6000 Å then fringe formed at that point is

A. 10th bright

B. 10 th dark

C. 9th bright

D. 9th dark

Answer: c

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29. Same current is flowing in two alternating circuits. The first circuit contains only inductances and the other contains only a capacitor, if the frequency of the e.m.f of AC is

increased, the effect on the value of the current will be

A. increase in first circuit and decrease in second

B. increase in both circuits

C. decrease in both circuits

D. decrease in first circuit and increase in second

Answer: c

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30. The differeence in the effective capacity of two similar capacitor when joined in series and then in paralllel is 6 μ F the capacity of each capacitor is

A. $2\mu F$

B. $4\mu F$

C. $8\mu F$

D. $16\mu F$

Answer: a

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31. Which logic gate produces LOW output when any of the inputs in HIGH

A. AND

B. OR

C. NAND

D. NOR

Answer: b

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32. An electron of mass m and charge q is accelerated from rest in a uniform electric field of strength E. The velocity acquired by it as it travels a distance l is

A. $\left[\frac{2Eql}{m}\right]^{1/2}$

B. $\left[\frac{2Eq}{mI}\right]^{1/2}$

C. $\left[\frac{2Em}{ql}\right]^{1/2}$

D. $\left[\frac{Eq}{mI}\right]^{1/2}$

Answer: a

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33. A light is travelling from air a medium the velocity of light in a medium is reduced to to 0.75 times the velocity n air assume that angle of incidence I is very small the deviation of the ray is

A. i

B. $\frac{i}{3}$

C. $\frac{i}{4}$

D. $\frac{3i}{4}$

Answer: b

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34. The electric field intensity at point near and outside the surface of a charged conductor of any shate is E_1 the elecric field intensity due to uniformly charged conductor of any shape is E_1 the electric field intensity

due ot uniformly charged infinite thin plane sheet is E_2 the relation between E_1 and E_2 is

A. $2E_1 = E_2$

B. $E_1 = E_2$

C. $E_1 = 2E_2$

D. $E_1 = 4E_1$

Answer: b

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35. Sensivitivity of a moving coil galvanometer can be increased by

A. decreasing the number of turns of coil

B. increasing the number of turns of coil

C. decreasing the area of a coil

D. by using a weak magnet

Answer: B

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36. For the hydrogen atom the energy of radiation emitted in the transitation from 4th excited state

to 2nd exicited state according to Bohr 's theory is

A. 0.57 eV

B. 0.667 eV

C. 0.967 eV

D. 1.267 eV

Answer: C

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37. Two coherent monochromatic light beams of intensities 4/ and 9/ are superimosed the maxmum and minimum possible intenties in the resulting beam are

A. 3I and 2I

B. 9I and 5I

C. 16I and 3I

D. 25I and I

Answer: a

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38. The resistances in left and right gap of a meter brigdge are 20 ω and 30 ω respecitively when the resistance in the left gap is reduced to half its value then balance point shifts by

A. 15 cm to the right

B. 15 cm to the left

C. 20 cm to the right

D. 20 cm to the left

Answer: a

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39. For the same angle of incidence the angles fo refreaction in media P,Q ,R and S are $50^\circ, 40^\circ, 30^\circ, 20^\circ$ respectively the speed of lights is minimum in medium

A. P

B. Q

C. R

D. S

Answer: S

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40. The process of regaining of information from carrier wave at the receiver is termed as

A. demodulation

B. modulation

C. attenuation

D. amplification

Answer: c

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41. A potentiometer wire of length 10 m is connected in series with a battery the emf of a cell balances against 250 cm length of wire if

length of potentiometer wire is increased by 1 m then new balancing length of wire will be

A. 2.00 m

B. 2.25 m

C. 2.50 m

D. 2.75 m

Answer: a

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42. Two coils A and B have mutual inductance 2×10^2 henry if the current in he primary is i=5 sin 10^{π} t then the maximum value of emf induced in coil B is

A. π volt

B. $\frac{\pi}{2}$ volt

C. $\frac{\pi}{3}$ volt

D. $\frac{\pi}{4}$ volt

Answer: c

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43. For a transitor the current ratio α_{DC} is 69/70 the current gain β_{DC} is

A. 66

B. 67

C. 69

D. 71

Answer: d

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44. In young double slit experiment the ratio of intentsities of bright and dark bands is 16 which means

A. the ratio of their amplitudes is 5

B. intensities of individual sources are 25 and 9 units respiectively

C. the ratio of their amplitudes is 4

D. intensities of individual sources are 4 and 3 units respectively

Answer: B

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45. A range of galvanometer is V when 50Ω resistance is connected is connected in series its range gets doubled when 500Ω resistance is connected in series galvanometer resistance is

A. 100ω

B. 200ω

C. 300ω

D. 400ω

Answer: b

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46. The capacity of a parallel plate air capacitor is $2\mu F$ and voltage beteen the plates is changing at the rate of 3 v/s the displacement current in the capacitor is

A. $2\mu A$

B. $3\mu A$

C. $5\mu A$

D. $6\mu A$

Answer: a

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47. A capacitor $C_1 = 4\mu$ F is connected is series with another capacitor $C_2 = 1\mu$F the

combination is connected across DC source of 200 V the ratio of potential across C_2 to C_1 is

A. $2:1$

B. $4:1$

C. $8:1$

D. $16:1$

Answer: a

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48. When monochromatic light of wavelength λ is incident on a metallic surface the stopping potential for photoelectric current is $3V_0$ when same surface is illuminated with light of waelength 2λ the stopping potential is V_0

The threshold wavelength for this surface when photoelectric effect takes place is

A. λ

B. 2λ

C. 3λ

D. 4λ

Answer: d

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49. A coil carrying current I has radius r and number of turns n it is rewound so that radis of new coil is $\frac{r}{4}$ and it carries current I the ratio fo magenic moment of new coil to that of original coil is

A. 1

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

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

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

Answer: b

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50. The de Broglie wavelength λ of a particle

A. is proportional to mass

B. is proportional to impluse

C. is inversely proportional to impulse

D. does not depend on impulse

Answer: a

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51. In the expression for boyle 's law the product pV has dimensions of

A. force

B. impluse

C. energy

D. momentum

Answer: b

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52. The difference between angular speed fo minute hand and second hand of a clock is

A. $\frac{59\pi}{900} ra \frac{d}{s}$

B. $\frac{59\pi}{1800} ra \frac{d}{s}$

C. $\frac{59\pi}{2400} ra \frac{d}{s}$

D. $\frac{59\pi}{3600} ra \frac{d}{s}$

Answer: b

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53. A metal rod of length L cross sectional area A young modulus Y and coefficient of linear expansion α is heated to $t^{\circ}C$ The work that can be performed by the rod when heated is

A. $\frac{Ya\alpha Lt^2}{2}$

B. $\frac{Ya\alpha^2 Lt^2}{2}$

C. $\frac{Ya\alpha^2 L^2t^2}{2}$

D. $\frac{Ya\alpha Lt}{2}$

Answer: d

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when held by tension T If the tension is increased to 4T the tone emitted by the wire will be of frequency

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B. 70 m/s

C. 105 m/s

D. 140 m/s

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57. A solid cylinder has mass M radius R and length / its moment of inertia about an axis passing through its centre and perpendicular to its own axis is

A. $\frac{2MR^2}{3} + \frac{MI^2}{12}$

B. $\frac{MR^2}{3} + \frac{MI^2}{12}$

C. $\frac{3MR^2}{3} + \frac{MI^2}{12}$

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58. A particle is executing SHM of periodic time T the time taken by a particle in moving from mean position to half the maximum displacement is $(\sin 30^\circ = 0.5)$

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D. $\frac{T}{12}$

Answer: d

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B. $\left[MLT^{-3}K^{-3}\right]$

C. $\left[ML^2T^{-3}K^{-4}\right]$

D. $\left[ML^0T^{-3}K^{-4}\right]$

Answer: a

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60. An open and closed organ pipe have the same length the ratio pth mode of frequency of vibration of air in two pipe is

A. $P(2p+1)$

B. $\frac{2p}{2p-1}$

C. p

D. 1

Answer: c

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cord and falls from rest after falling throgh a distance h the angular velocity of the wheel will be

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B. $\left[\frac{2mgh}{I+2mr^2}\right]^{1/2}$

C. $\left[\frac{2mgh}{I+mr^2}\right]^{1/2}$

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Answer: b

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62. A toy cart is tied to the end of an unstretched string of length / when revolved the toy cart moves in horizontal circle with radius 2/ and time period T if it is speeded unitl it moves in horizontal circle of radius 3/ with period T_1 relation between T and T_1 is (Hooke 's law is obeyed)

A. $T_1 = (2)\sqrt{3}T$

B. $T_1 = \frac{\sqrt{3}}{2}T$

C. $T_1 = \frac{\sqrt{2}}{3}T$

D. $T_1 = \frac{\sqrt{3}}{2}T$

Answer: d

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63. In a pipe opened at both ends n_1 and n_2 be the frequencies corresponding to vibrating lengths L_1 and L_2 respectively .The end correction is

A. $\frac{n_1 I_2 - n_2 I_2}{2(n_1 - n_2)}$

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B. $\frac{kT^2g}{4\pi^2}$

C. $\frac{kTg}{2\pi^2}$

D. $\frac{kT^2g}{2\pi^2}$

Answer: c

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65. A satellite of mass m s revolving in circlular orbit of radius r aroiund the earth its angular momentum w.r.t the centre of its orbit is

(M=mass of earth G= universal gravitational constant)

A. $(GMmr)^{1/2}$

B. $\left(GM^2mr\right)^{1/2}$

C. $\left(GMm^2r^2\right)^{1/2}$

D. $\left(GM^2m^2r\right)^{1/2}$

Answer: b

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Answer: a

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A. d=h

B. $d = \frac{h}{2}$

C. $d = \frac{h}{4}$

D. d=2h

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B. $\frac{R^2\omega^2}{4s}$

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[p density of liquid T= surface tension of liquid]

A. $\left[\frac{6T}{\rho}\left(\frac{1}{a}-\frac{1}{b}\right)\right]^{1/2}$

B. $\left[\frac{6T}{\rho}\left(\frac{1}{b}-\frac{1}{a}\right)\right]^{1/2}$

C. $\left[\frac{\rho}{6T}\left(\frac{1}{a}-\frac{1}{b}\right)\right]^{1/2}$

D. $\left[\frac{\rho}{6T}\left(\frac{1}{b}-\frac{1}{a}\right)\right]^{-1/2}$

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Answer: c

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78. The distances of a point on the screen from two slits in biprism experiment is 1.8×10^5 m and 1.23×10^5 m if wavelength of light used is 6000 Å then fringe formed at that point is

A. 10th bright

B. 10 th dark

C. 9th bright

D. 9th dark

Answer: c

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79. Same current is flowing in two AC circuits first contains only inductance and second contains only capacitance if frequency of AC is increased for both the current will

A. increase in first circuit and decrease in second

B. increase in both circuits

C. decrease in both circuits

D. decrease in first circuit and increase in second

Answer: c

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80. The differeence in the effective capacity of two similar capacitor when joined in series and then in paralllel is 6 μ F the capacity of each capacitor is

A. $2\mu F$

B. $4\mu F$

C. $8\mu F$

D. $16\mu F$

Answer: a

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81. Which logic gate produces LOW output when any of the inputs in HIGH

A. AND

B. OR

C. NAND

D. NOR

Answer: b

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82. An electron of mass m and charge q is accelerated from rest in a uniform electric field

of strength E the velocity acquired by it as it travels a distance l is

A. $\left[\frac{2Eql}{m}\right]^{1/2}$

B. $\left[\frac{2Eq}{mI}\right]^{1/2}$

C. $\left[\frac{2Em}{ql}\right]^{1/2}$

D. $\left[\frac{Eq}{mI}\right]^{1/2}$

Answer: a

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83. A light is travelling from air a medium the velocity of light in a medium is reduced to to 0.75 times the velocity n air assume that angle of incidence I is very small the deviation of the ray is

A. i

B. $\frac{i}{3}$

C. $\frac{i}{4}$

D. $\frac{3i}{4}$

Answer: b

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84. The electric field intensity at point near and outside the surface of a charged conductor of any shate is E_1 the elecric field intensity due to uniformly charged conductor of any shape is E_1 the electric field intensity due ot uniformly charged infinite thin plane sheet is E_2 the relation between E_1 and E_2 is

A. $2E_1 = E_2$

B. $E_1 = E_2$

C. $E_1 = 2E_2$

D. $E_1 = 4E_1$

Answer: b

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85. Sensivitivity of a moving coil galvanometer can be increased by

A. decreasing the number of turns of coil

B. increasing the number of turns of coil

C. decreasing the area of a coil

D. by using a weak magnet

Answer: c

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86. For the hydrogen atom the energy of radiation emitted in the transitation from 4th excited state

to 2nd exicited state according to Bohr 's theory is

A. 0.57 eV

B. 0.667 eV

C. 0.967 eV

D. 1.267 eV

Answer: d

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87. Two coherent monochromatic light beams of intensities 4/ and 9/ are superimosed the

maxmum and minimum possible intenties in the resulting beam are

A. 3I and 2I

B. 9I and 5I

C. 16I and 3I

D. 25I and I

Answer: a

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88. The resistances in left and right gap of a meter brigdge are 20 ω and 30 ω respecitively when the resistance in the left gap is reduced to half its value then balance point shifts by

A. 15 cm to the right

B. 15 cm to the left

C. 20 cm to the right

D. 20 cm to the left

Answer: a

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89. For the same angle of incidence the angles fo refreaction in media P,Q ,R and S are $50^\circ, 40^\circ, 30^\circ, 20^\circ$ respectively the speed of lights is minimum in medium

A. P

B. Q

C. R

D. S

Answer: c

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90. The process of regaining of information from carrier wave at the receiver is termed as

A. demodulation

B. modulation

C. attenuation

D. amplification

Answer: c

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91. A potentiometer wire of length 10 m is connected in series with a battery the emf of a cell balances against 250 cm length of wire if length of potentiometer wire is increased by 1 m then new balancing length of wire will be

A. 2.00 m

B. 2.25 m

C. 2.50 m

D. 2.75 m

Answer: a

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92. Two coils A and B have mutual inductance 2×10^2 henry if the current in he primary is i=5 sin 10^{π} t then the maximum value of emf induced in coil B is

A. π volt

B. $\frac{\pi}{2}$ volt

C. $\frac{\pi}{3}$ volt

D. $\frac{\pi}{4}$ volt

Answer: c

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93. For a transitor the current ratio α_{DC} is 69/70 the current gain β_{DC} is

A. 66

B. 67

C. 69

D. 71

Answer: d

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94. In young double slit experiment the ratio of intentsities of bright and dark bands is 16 which means

A. the ratio of their amplitudes is 5

B. intensities of individual sources are 25 and 9 units respiectively

C. the ratio of their amplitudes is 4

D. intensities of individual sources are 4 and 3 units respectively

Answer: a

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95. A range of galvanometer is V when 50Ω resistance is connected is connected in series its range gets doubled when 500Ω resistance is connected in series galvanometer resistance is

A. 100ω

B. 200ω

C. 300ω

D. 400ω

Answer: b

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96. The capacity of a parallel plate air capacitor is $2\mu F$ and voltage beteen the plates is changing at the rate of 3 v/s the displacement current in the capacitor is

A. $2\mu A$

B. $3\mu A$

C. $5\mu A$

D. $6\mu A$

Answer: a

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97. A capacitor $C_1 = 4\mu$ F is connected is series with another capacitor $C_2 = 1\mu$F the combination is connected across DC source of 200 V the ratio of potential across C_2 to C_1 is

A. $2:1$

B. $4:1$

C. $8:1$

D. $16:1$

Answer: a

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98. When monochromatic light of wavelength λ is incident on a metallic surface the stopping potential for photoelectric current is $3V_0$ when same surface is illuminated with light of waelength 2λ the stopping potential is V_0

The threshold wavelength for this surface when photoelectric effect takes place is

A. λ

B. 2λ

C. 3λ

D. 4λ

Answer: d

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99. A coil carrying current I has radius r and number of turns n it is rewound so that radis of new coil is $\frac{r}{4}$ and it carries current I the ratio fo magenic moment of new coil to that of original coil is

A. 1

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

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

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

Answer: b

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100. The de Broglie wavelength λ of a particle

A. is proportional to mass

B. is proportional to impluse

C. is inversely proportional to impulse

D. does not depend on impulse

Answer: a

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Chemistry

1. If average velocity of a sample of gas molecules at 300 K is $5cms^{-1}$, what is RMS velocity of same sample of gas molecules at the same temperature ? (Given , $\alpha : u : v = 1 : 1.224 : 1.127$)

A. 6.112 cm/s

B. 4.605 cm/s

C. 4.085 cm/s

D. 5.430 cm/s

Answer: D

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