Crunchersoft

PCM

TIME: 15 min XII - A Div **Marks: 300**

Physics

1) If θ_i , is the inversion temperature, θ_n is the neutral temperature, θ_c is the temperature of the cold junction, then

A) $\theta_i + \theta_c = \theta_n$ **B)** $\theta_i - \theta_c = 2\theta_n$

C) $\frac{\theta_i + \theta_c}{2} = \theta_n$ **D)** $\theta_c - \theta_i = 2\theta_n$

2) Identify the pair whose dimensions are equal

A) torque and work **B) stress and energy**

C) force and stress **D) force and work**

3) Which of the following are not electromagnetic waves?

A) cosmic rays **B) gamma rays**

C) β -rays **D) X- rays**

4) The escape velocity of a body depends upon mass as

A) m^0 **B)** m^1 **C)** m^2 **D)** m^3

5) Which of the following is used in optical fibres ?

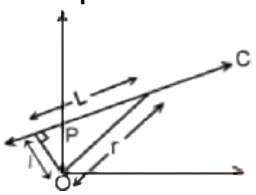
A) total internal reflection

B) scattering

C) diffraction

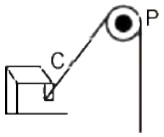
D) refraction

6) A particle of mass m moves along line PC with velocity v as shown. What is the angular momentum of the particle about P?



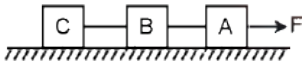
A) mvL **B) mvl** **C) mvr** **D) zero**

7) One end of a massless rope, which passes over a massless and frictionless pulley P is tied to a hook C while the other end is free. Maximum tension that the rope can bear is 360 N. With what value of maximum safe acceleration (in ms^{-2}) can a man of 60 kg climb on the rope?



A) 16 **B) 6** **C) 4** **D) 8**

8) Three identical blocks of masses m = 2kg are drawn by a force F = 10.2 N with an acceleration of 0.6 ms^{-2} on a frictions surface, then what is the tension (in N) in the string between the blocks B and C ?



A) 9.2 **B) 7.8** **C) 4** **D) 9.8**

9) Two spheres of the same material have radii 1 m and 4m and temperatures 4000 K and 2000 K respectively. The ratio of the energy radiated per second by the first sphere to that by the second is

A) 1 : 1 **B) 16:1** **C) 4 : 1** **D) 1 : 9**

10) A light string passing over a smooth light pulley connects two blocks of masses m_1 and m_2 (vertically). If the acceleration of the system is g/8, then the ratio of the masses is

A) 8 : 1 **B) 9 : 7** **C) 4 : 3** **D) 5 : 3**

11) Capacitance (in F) of a spherical conductor with radius 1 m is

A) 1.1×10^{-10} **B)** 10^{-6}

C) 9×10^{-9} **D)** 10^{-3}

12) If a charge q is placed at the centre of the line joining two equal charges Q such that the system is in equilibrium then the value of q is

A) Q/2 **B) - Q/2** **C) Q/4** **D) -Q/4**

13) 1 mole of a gas with $\gamma = 7/5$ is mixed with 1 mole of a gas with $\gamma = 5/3$, then the value of γ for the resulting mixture is

A) 7/5 **B) 2/5** **C) 24/16** **D) 12/7**

14) Speeds of two identical cars are u and 4u at the specific instant. The ratio of the respective distances in which the two cars are stopped from that instant is

A) 1 : 1 **B) 1 : 4** **C) 1 : 8** **D) 1 : 16**

15) Two forces are such that the sum of their magnitudes is 18 N and their resultant is 12 N which is perpendicular to the smaller force. Then the magnitudes of the forces are

A) 12 N, 6 N **B) 13 N, 5 N**

C) 10 N, 8 N **D) 16 N, 2 N**

16) When forces F_1, F_2, F_3 are acting on a particle of mass m such that F_2 and F_3 are mutually perpendicular, then the particle remains stationary. If the force F_1 is now removed then the acceleration of the particle is

A) F_1/m **B)** F_2F_3/mF_1

C) $(F_2 - F_3)/m$ **D)** F_2/m

17) Moment of inertia of a circular wire of mass M and radius R about its diameter is

A) $MR^2/2$ **B)** MR^2 **C)** $2MR^2$ **D)** $MR^2/4$

18) Even Carnot engine cannot give 100% efficiency because we cannot

A) prevent radiation

B) find ideal sources

C) reach absolute zero temperature

D) eliminate friction

19) In a transformer, number of turns in the primary coil are 140 and that in the secondary coil are 280. If current in primary coil is 4A, then that in the secondary coil is

A) 4 A **B) 2 A** **C) 6 A** **D) 10 A**

20) A solid sphere, a hallow sphere and a ring are released from top of an inclined plane (frictionless) so that they slide down the plane. Then maximum acceleration down the plane is for (no rolling)

A) solid sphere **B) hollow sphere**

C) ring **D) all same**

21) The time period of a charged particle undergoing a circular motion in a uniform magnetic field is independent of its

A) speed **B) mass**

C) charge **D) magnetic induction**

22) At what temperature is the r.m.s. velocity of a hydrogen molecule equal to that of an oxygen molecule at 47° C?

A) 80 K **B) - 73 K** **C) 3 K** **D) 20 K**

23) The mass of product liberated on anode in an electrochemical cell depends on (where t is the time period, for which the current is passed)

A) $(It)^{1/2}$ **B) IT** **C) I/t** **D)** I^2t

24) A lift is moving down with acceleration a. A man in the lift drops a ball inside the lift. The acceleration of the ball as observed by the man in the lift and a man standing stationary on the ground are respectively

A) g, g **B) g - a, g - a**

C) g - a, g **D) a, g**

25) A child swinging on a swing in sitting position, stands up, then the time period of the swing will

A) increase

B) decrease

C) remains same

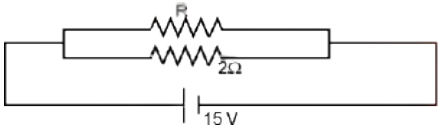
D) increases if the child is tall and decreases if the child is short

26) Wavelength of light used in an optical instrument are $\lambda_1 = 4000$Å and $\lambda_2 = 5000$Å then ratio of their respective resolving powers (corresponding to λ_1 and λ_2) is

A) 16 : 25 **B) 9 : 1**

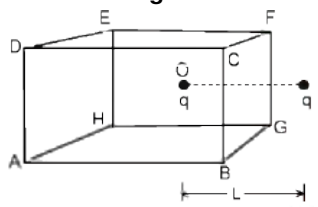
C) 4 : 5 **D) 5 : 4**

27) If in the circuit, power dissipation is 150 W, then R is



A) 2Ω **B)** 6Ω **C)** 5Ω **D)** 4Ω

28) A charged particle q is placed at the centre O of cube of length L (A B C D E F G H). Another same charge q is placed at a distance L from O. Then the electric flux through ABCD is



A) $q/4\pi \in_0 L$ **B) zero**

C) $q/2\pi \in_0 L$ **D)** $q/3\pi \in_0 L$

29) If a spring has time period T, and is cut into n equal parts, then the time period of each part will be

A) $T\sqrt{n}$ **B)** $T/\sqrt{n}$ **C) nT** **D) T**

30) Energy required to move a body of mass m from an orbit of radius 2R to 3R is

A) GMm/12R^2 **B) GMm/3R^2**

C) GMm/8R **D) GMm/6R**

31) The part of a transistor which is most heavily doped to produce large number of majority carriers is

A) emmiter

B) base

C) collector

D) can be any of the above three

32) The energy band gap is maximum in

A) metals **B) superconductors**

C) insulators **D) semiconductors**

33) If mass-energy equivalence is taken into account, when water is cooled to form ice, the mass of water should

A) increase

B) remain unchanged

C) decrease

D) first increase then decrease

34) When temperature increases, the frequency of a tuning fork

A) increases

B) decreases

C) remains same

D) increases or decreases depending on the material

35) Cooking gas containers are kept in a lorry moving with uniform speed. The temperature of the gas molecules inside will

A) increase

B) decrease

C) remain same

D) decrease for some, while increase for others

36) If suddenly the gravitational force of attraction between Earth and a satellite revolving around it becomes zero, then the satellite will

A) continue to move in its orbit with same velocity

B) move tangentially to the originally orbit in the same velocity

C) become stationary in its orbit

D) move towards the earth.

37) If a body looses half of its velocity on penetrating 3 cm in a wooden block, then how much will it penetrate more before coming to rest?

A) 1 cm **B) 2 cm** **C) 3 cm** **D) 4 cm**

38) From a building two balls A and B are thrown such that A is thrown upwards A and B downwards (both vertically). If v_A and v_B are their respective velocities on reaching the ground, then

A) $v_B > v_A$

B) $v_A = v_B$

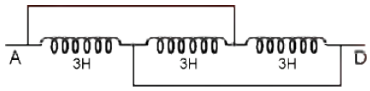
C) $v_A > v_B$

D) their velocities depend on their masses

39) A ball whose kinetic energy is E, is projected at an angle of 45° to the horizontal. The kinetic energy of the ball at the highest point of its flight will be

A) E **B)** $E/\sqrt{2}$ **C) E/2** **D) zero**

40) The inductance between A and D is



A) 3.66 H **B) 9 H** **C) 0.66 H** **D) 1 H**

41) Which of the following is more closed to a black body?

A) black board paint **B) green leaves**

C) black holes **D) red roses**

42) If there are n capacitors in parallel connected to V volt source, then the energy stored is equal to

A) CV **B)** $\frac{1}{2}nCV^2$ **C)** CV^2 **D)** $\frac{1}{2n}CV^2$

43) By increasing the temperature, the specific resistance of a conductor and a semiconductor

A) increases for both **B) decreases for both**

C) increases, decreases **D) decreases, increases**

44) If N_0 is the original mass of the substance of half-life period $t_{1/2} = 5$ years, then the amount of substance left after 15 years is

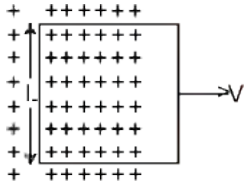
A) $N_0/8$ **B)** $N_0/16$ **C)** $N_0/2$ **D)** $N_0/4$

45) Infra red radiation is detected by

A) spectrometer **B) pyrometer**

C) nanometer **D) photometer**

46) A conducting square loop of side L and resistance R moves in its plane with a uniform velocity v perpendicular to one of its sides. A magnetic induction B constant in time and space, pointing perpendicular and into the plane at the loop exists everywhere with half the loop outside the field, as shown in figure. The induced emf is



A) zero **B) RvB** **C) VBL/R** **D) VBL**

47) Formation of covalent bonds in compounds exhibits

A) wave nature of electron

B) particle nature of electron

C) both wave and particle nature of electron

D) none of these

48) Sodium and copper have work functions 2.3 eV and 4.5 eV respectively. Then the ratio of the wave lengths is nearest to

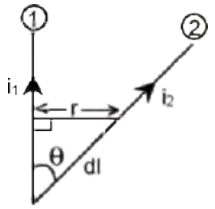
A) 1 : 2 **B) 4 : 1** **C) 2 : 1** **D) 1 : 4**

49) At a specific instant emission of radioactive compound is deflected in a magnetic field. The compound can emit (i) electrons (ii) protons (iii) He^{2+} (iv) neutrons The emission at instant can be

A) i, ii, iii **B) i, ii, iii, iv**

C) iv **D) ii, iii**

50) Wires 1 and 2 carrying currents i_1 and i_2 respectively are inclined at an angle θ to each other. What is the force on a small element dl of wire 2 at a distance of r from wire 1 (as shown in the figure) due to the magnetic field of wire 1 ?



A) $\frac{\mu_0}{2\pi r} i_1 i_2 dl \tan\theta$ **B)** $\frac{\mu_0}{2\pi r} i_1 i_2 dl \sin\theta$

C) $\frac{\mu_0}{2\pi r} i_1 i_2 dl \cos\theta$ **D)** $\frac{\mu_0}{4\pi r} i_1 i_2 dl \sin\theta$

51) Electromagnetic waves are transverse in nature is evident by

A) polarization **B) interference**

C) reflection **D) diffraction**

52) At absolute zero, Si acts as

A) non metal **B) metal**

C) insulator **D) none of these**

53) Heat given to a body which raises its temperature by $1^\circ C$ is

A) water equivalent

B) thermal capacity

C) specific heat

D) temperature gradient

54) If a current is passed through a spring then the spring will

A) expand **B) compress**

C) remains same **D) none of these**

55) Two identical particles move towards each other with velocity 2v and v respectively. The velocity of centre of mass is

A) v **B) v/3** **C) v/2** **D) zero**

56) A spring of force constant 800 N/m has an extension of 5 cm. The work done is extending it from 5 cm to 15 cm is

A) 16 J **B) 8 J** **C) 32 J** **D) 24 J**

57) A cylinder of height 20 m is completely filled with water. The velocity of efflux of water (in ms^{-1}) through a small hole on the side wall of the cylinder near its bottom is

A) 10 **B) 20** **C) 25.5** **D) 5**

58) The minimum velocity (in ms^{-1}) with which a car driver must traverse a flat curve of radius 150 m and coefficient of friction 0.6 to avoid skidding is

A) 60 **B) 30** **C) 15** **D) 25**

59) Initial angular velocity of a circular disc of mass M is ω_1 . Then two small spheres of mass m are attached gently to diametrically opposite points on the edge of the disc. What is the final angular velocity of the disc?

A) $\left(\frac{M+m}{M}\right)\omega_1$ **B)** $\left(\frac{M+m}{m}\right)\omega_1$

C) $\left(\frac{M}{M+4m}\right)\omega_1$ **D)** $\left(\frac{M}{M+2m}\right)\omega_1$

60) In a simple harmonic oscillator, at the mean position

A) kinetic energy is minimum, potential energy is maximum

B) both kinetic and potential energies are maximum

C) kinetic energy is maximum, potential energy is minimum

D) both kinetic and potential energies are minimum

61) If an electron and a proton having same momenta enter perpendicular to a magnetic field, then

A) curved path of electron and proton will be same (ignoring the sense of revolution)

B) they will move undeflected

C) curved path of electron is more curved than that of the proton

D) path of proton is more curved

62) On moving a charge of 20 coulombs by 2cm, 2 J of work is done, then the potential difference between the points is

A) 0.1V **B) 8 V** **C) 2 V** **D) 0.5V**

63) A wave $y = a\sin(\omega t - kx)$ on a string meets with another wave producing a node at x = 0. Then the equation of the unknown wave is

A) $y = a\sin(\omega t + kx)$ **B)** $y = -a\sin(\omega t + kx)$

C) $y = a\sin(\omega t - kx)$ **D)** $y = -a\sin(\omega t - kx)$

64) A tuning fork arrangement (pair) produces 4 beats / sec with one fork of frquency 288 cps. A little wax is placed on the unknown fork and it then produces 2 beats /sec. The frequency of the unknown fork is

A) 286 cps **B) 292 cps** **C) 294 cps** **D) 288 cps**

65) Tube A has both ends open while tube B has one end closed, otherwise they are identical. The ratio of fundamental frequency of tube A and B is

A) 1 : 2 **B) 1 : 4** **C) 2 : 1** **D) 4 : 1**

66) If 13.6 eV energy is required to ionize the hydrogen atom, then the energy required to remove an electron from n=2 is

A) 10.2 eV **B) 0 eV**

C) 3.4 eV **D) 6.8eV**

67) A wire when connected to 220 V mains supply has power dissipation P_1. Now the wire is cut into two equal pieces which are connected in parallel to the same supply. Power dissipation in this case is P_2. Then $P_2 : P_1$ is

A) 1 **B) 4** **C) 2** **D) 3**

68) If two mirrors are kept at 60° to each other, then the number of images formed by them is

A) 5 **B) 6** **C) 7** **D) 8**

69) If in a circular coil A of radius R, current I is flowing and in another coil B of radius 2R a current 2I is flowing, then the ratio of the magnetic fields B_A and B_B, produced by them will be

A) 1 **B) 2** **C) 1/2** **D) 4**

70) If an ammeter is to be used in place of a voltmeter, then we must connect with the ammeter a

A) low resistance in parallel

B) high resistance in parallel

C) high resistance in series

D) low resistance in series

71) The kinetic energy needed to project a body of mass m from the earth surface (radius R) to infinity is

A) mgR/2 **B) 2mgR** **C) mgR** **D) mgR/4**

72) An astronomical telescope has a large aperture to

A) reduce spherical aberration

B) have high resolution

C) increase span of observation

D) have low dispersion

73) The power factor of an AC circuit having resistance (R) and inductance (L) connected in series and an angular velocity ω is

A) $R/\omega L$ **B)** $R/(R^2 + \omega^2 L^2)^{1/2}$

C) $\omega L/R$ **D)** $R/(R^2 - \omega^2 L^2)^{1/2}$

74) Length of a string tied to two rigid supports is 40 cm. Maximum length (wave length in cm) of a stationary wave produced on it is

A) 20 **B) 80** **C) 40** **D) 120**

75) Which statement is incorrect ?

A) all reversible cycles have same efficiency

B) reversible cycle has more efficiency than an irreversible one

C) Carnot cycle is a reversible one

D) Carnot cycle has the maximum efficiency in all cycles

Correct Answer Sheet

Subject - Physics

Total Questions - 75 **Total Marks - 300**

Test ID -

1	C	2	A	3	C	4	A	5	A	6	D	7	C	8	B	9	A	10	B	11	A	12	D
13	C	14	D	15	B	16	A	17	B	18	C	19	B	20	D	21	A	22	D	23	B	24	C
25	B	26	D	27	B	28	B	29	B	30	D	31	A	32	C	33	A	34	B	35	A	36	C
37	A	38	B	39	C	40	D	41	A	42	B	43	C	44	A	45	B	46	D	47	A	48	C
49	A	50	C	51	A	52	C	53	B	54	B	55	C	56	B	57	B	58	B	59	C	60	C
61	A	62	A	63	B	64	B	65	C	66	C	67	B	68	A	69	A	70	C	71	C	72	B
73	B	74	B	75	A																		

Solutions/Discription/Hints/Tricks

Subject - Physics

Total Questions - 75 **Total Marks - 300**

Test ID -

1	C	2	A	3	C	4	A	5	A	6	D	7	C	8	B	9	A	10	B	11	A	12	D
13	C	14	D	15	B	16	A	17	B	18	C	19	B	20	D	21	A	22	D	23	B	24	C
25	B	26	D	27	B	28	B	29	B	30	D	31	A	32	C	33	A	34	B	35	A	36	C
37	A	38	B	39	C	40	D	41	A	42	B	43	C	44	A	45	B	46	D	47	A	48	C
49	A	50	C	51	A	52	C	53	B	54	B	55	C	56	B	57	B	58	B	59	C	60	C
61	A	62	A	63	B	64	B	65	C	66	C	67	B	68	A	69	A	70	C	71	C	72	B
73	B	74	B	75	A																		

1)

2) Both have the dimension $M^1L^2T^{-2}$

3) $\beta-$ rays are the beam of fast moving electrons

4) $V_{esc} = \sqrt{2gR}$, where R is radius of the planet
Hence escape velocity is independent of m

5)

6) Zero, line of motion through the point P.

7) $T-60g = 60a; T = 3000N; \therefore a = 4ms^{-2}$

8) Apply Newton"s second law
$F-T_{ab} = ma; T_{ab}-T_{bc} = ma \therefore T_{bc} = 7.8N$

9) Energy radiated $\propto R^2T^4$

10) $a = \dfrac{m_1+m_2}{m_1-m_2}g; \dfrac{1}{8} = \dfrac{m_1-m_2}{m_1+m_2} \Rightarrow m_1 : m_2 = 9:7$

11)

12) Apply the condition for equilibrium of each charge

13) γ for resulting mixture should be in between 7/5 and 5/3

14) Use $u^2 = 2as$. a is same for both cases
$s_1 = u^2/2a; s_2 = 16u^2/2a = 16s_1 \Rightarrow s_1 : s_2 = 1:16$

15) Use $\tan\alpha = \dfrac{P\sin\theta}{Q+P\cos\theta} \Rightarrow \tan 90^\circ = \dfrac{P\sin\theta}{Q+P\cos\theta} = \infty$
$\therefore Q + P\cos\theta = 0 \Rightarrow P\cos\theta = -Q$
$R = \sqrt{P^2+Q^2+2PQ\cos\theta} R = \sqrt{P^2+Q^2-2Q^2}$ or $R = \sqrt{P^2-Q^2} = 12$
$144 = (P+Q)(P-Q)$ or $P-Q = 144/18 = 8$
$\therefore P = 13N$ and $Q = 5N$

16) Resultant of F_2 and F_3 is of magnitude F_1.

17)

18) Absolute zero temperature is practically not reachable

19) $I_1N_1 = I_2N_2 \Rightarrow I_2 = \dfrac{4\times 140}{280} = 2A$

20)

21) $T = 27\pi m/Bq$

22) $v_{rms}\propto\sqrt{T/m}; \sqrt{\dfrac{273+47}{32}} = \sqrt{\dfrac{T}{2}}$ or T=20 K

23) From Faradays law of electrolysis, $m \propto it$.

24) Man in the lift is in a non - inertial frame so we have to take into account the pseudo acceleration

25) $T = 2\pi\sqrt{I_{eff}/8}$; I_{eff} decreases when the child stands up.

26) Resolving power $\propto(1/\lambda)$. Hence, $\dfrac{(RP)_1}{(RP)_2} = \dfrac{\lambda_2}{\lambda_1} = \dfrac{5}{4}$

27) $W = \dfrac{V^2}{r_{net}}; 150 = \dfrac{(15)^2}{R} + \dfrac{(15)^2}{2} \Rightarrow R = 6\Omega$

28) The flux for both the charges exactly cancels the effect of each other

29) Spring constant becomes n times for each piece. $T = 2\pi\sqrt{m/k}$
$\dfrac{T_1}{T_2} = \dfrac{\sqrt{nK}}{K}$ or $T_2 = T/\sqrt{n}$

30) $E = (PE)_{final} - (PE)_{initial} = \dfrac{-GMm}{3R} + \dfrac{GMm}{R} = \dfrac{GMm}{6R}$

31)

32) Maximum in insulators and overlapping in metals

33) Because thermal energy decreases, therefore mass should increase

34)

35) The molecular kinetic energy increases, and so temperature
increases.

36) When gravitational force becomes zero so centripetal

force on
satellite becomes zero so satellite will escape its round orbit and becomes stationary.

37) Let the initial velocity of the body be v. Hence the final velocity = v/2
Applying $v^2 = u^2 - 2as \Rightarrow \left(\frac{v}{2}\right)^2 = v^2 - 2.a.3 \Rightarrow a = v^2/8$
In IInd case when the body comes to rest, final velocity=0, initial velocity $= \frac{v}{2}$
Again, $(0)^2 = \left(\frac{v}{2}\right)^2 - 2.\frac{v^2}{8}.s$; or s=1 cm
So the extra penetration will be 1 cm

38) As the ball moves down from height "h" to ground the P.E at
height "h" is converted to K.E. at the ground (Applying Law of
conservation of Energy)
Hence, $\frac{1}{2}m_A v_A^2 = m_A g h_A$ or $v_A = \sqrt{2gh_A}$; Similarly, $v_B = \sqrt{2gh}$
or $v_A = v_B$

39)

40) The given circuit clearly shows that the inductors are in
parallel we have, $\frac{1}{L} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$ or $L = 1$
41) Black body also emits radiation whereas nothing escapes a black hole.
42) $E = \Sigma\frac{1}{2}CV^2 = \frac{1}{2}nCV^2$

43) Use $R_t = R_0\left(\frac{T}{273}\right)$

44) Amount left $= N_0/2^n = N_0/8$ (Here $n = 15/5 = 3$)
45)

46)

47) Covalent bond formation is best explained by orbital theory
which uses wave phenomena
48) $hc/\lambda_0 = W_0; \frac{(\lambda_0)_1}{(\lambda_0)_2} = \frac{(W_0)_2}{(W_0)_1} = \frac{4.5}{2.3} = 2:1$

49) Neutrons can"t be deflected by a magnetic field

50)

51)

52) Semiconductors are insulators at low temperature

53)

54) It will compress due to the force of attraction between two
adjacent coils carrying current in the same direction
55) Conserving Linear Momentum
$2Mv_c = 2Mv - Mv \Rightarrow v_c = v/2$

56) $W = \int_{x_1}^{x_2} F dx = \int_{x_1}^{x_2} Kx dx = K\left[\frac{x^2}{2}\right]_{x_1}^{x_2} = \frac{K}{2}[x_2^2 - x_1^2] = \frac{800}{2}[(0.15)^2 - (0.05)^2] = 8J$

57) $v = \sqrt{2gh} = \sqrt{2 \times 10 \times 20} = 20$ m/s

58) The condition to avoid skidding, $v = \sqrt{\mu rg} = \sqrt{0.6 \times 150 \times 10} = 30$ m/s

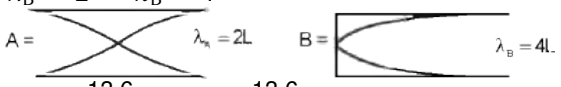
59) Angular momentum = conserved
$\frac{1}{2}MR^2\omega_1 = 2mR^2\omega + \frac{1}{2}MR^2\omega \Rightarrow \omega = \frac{M\omega_1}{M + 4m}$
60) K.E. is maximum and P.E minimum at mean position

61) $r = mv/Bq$ is same for both

62) $W = qV \Rightarrow V_A - V_B = 2/20 = 0.1V$
Here W is the work done in moving charge q from
point A to B
63) $y_1 + y_2 = a\sin(\omega t - kx) - a\sin(\omega t + kx)$
$= -2a\cos\omega t \times \sin kx \Rightarrow y_1 + y_2 = 0$ at $x = 0$

64) The fact that placing wax decreases the frequency of the unknown
fork and also the beat frequency states that the unknown fork is of
higher frequency.
$n - 288 = 4 \Rightarrow n = 292$ cps

65) $\frac{\lambda_A}{\lambda_B} = \frac{1}{2} \Rightarrow \frac{n_A}{n_B} = \frac{2}{1}$



66) $E_n = -\frac{13.6}{n^2} \Rightarrow E_2 = -\frac{13.6}{2^2} = 3.4\ eV$

67) $P_1 = V^2/R; P_2 = \frac{V^2}{(R/2)} + \frac{V^2}{(R/2)} = 4\frac{V^2}{R} = 4P_1$.

68) No. of images, $n = (360/\theta) - 1$. As $\theta = 60^\circ$ so $n = 5$
69) In coil A, $B = \frac{\mu_0}{4\pi}\frac{2\pi I}{R} \therefore B\alpha\frac{I}{R}$; Hence, $\frac{B_1}{B_2} = \frac{I_1}{R_1}.\frac{R_2}{I_2} = \frac{2}{2} = 1$
70) A voltmeter is a high resistance galvanometer and is connected
in parallel to circuit and ammeter is a low resistance galvanometer
so if we connect high resistance in series with ammeter its resistance
will be much high.

71) $KE = \frac{1}{2}mv_{esc}^2 = \frac{1}{2}m(\sqrt{2gR})^2 = mgR$

72) Large aperture increases the amount of light gathered by
the telescope increasing the resolution.
73)

74) $\lambda_{max}/2 = 40 \Rightarrow \lambda_{max} = 80$

75)