G.C.E (O/L) Support Seminar 2013

Revision Paper

Paper - I

Physics

For the A/L support seminar to be conducted under the supervision of the ministry od Education

Time 2 hours

- This paper contains 50 multiple choice questions. Easch question has five options. Two marks are allocated for each question. Total marks allotid for this paper is 100
- Answes all question.-
- Select the correct or the most appropriate answer (You will be provided an answer sheet at the exam to mark the answers)

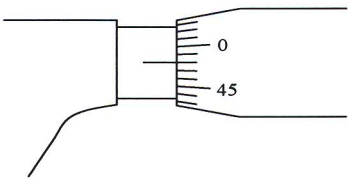
1. What is the unit of moment of force?

(1) J (2) W (3) $N\,m^2$ (4) N m (5) $N\,m^{-1}$

2. Which of the two set, given below are same in dimension ?

(1) Surface tension, Pressure
(2) Relative density, Relative velocity
(3) Work, Torque
(4) Change of momentum, force
(5) Power, Efficiency

3. The diagram shows a micrometer screw gauge with 1mm pitch. The jaws are coincidel. The drum of the micrometer is divided into 50 equal parts. Which statement below is true?



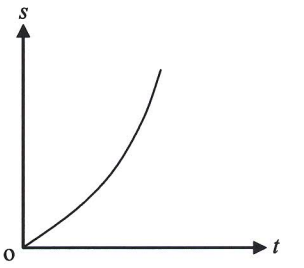
(1) The zero error is 0.48 mm, and zero error should be added to the measurment.
(2) The zero error is 0.48 mm, and should be subtracted from the measurment..
(3) The zero error is 0.02 mm, and should be subtracted from the measurment.
(4) The zero error is 0.02 mm, and zero error should be added to the measurment.
(5) The zero error is 0.04mm, and zero error should be added to the measurment.

4. The hight of a storey of a storeyed building with the ground floor, first floor, secnd floor, and third floor is 5 m in height. What is the time interval for a falling tile from the third floor?

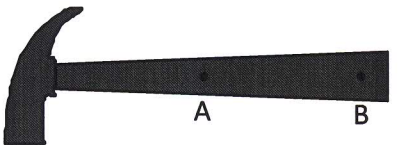
(1) 1 s (2) $\sqrt{2}$ s (3) $\sqrt{3}$ s (4) $(\sqrt{3} - \sqrt{2})$ s (5) $(\sqrt{3} + \sqrt{2})$ s

5. The diagram shows the distance - time graph of a moving object, which statement is the most suitable ?

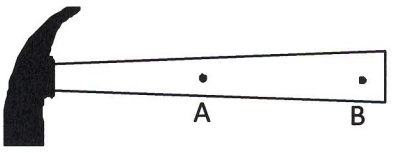
(1) A motion with uniform velocity .
(2) A motion with uniform accelaration.
(3) A motion in accelaration with starting at rest.
(4) A motion with deceleration with starting at rest.
(5) A motion in acceleration with and initial velocity.



6.



P



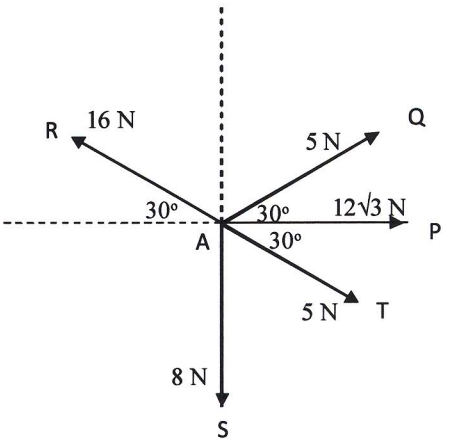
Q

The diagram shows two hammers which are equal in shape. Handle of the hammer P is made up of metal and handle of the hammer Q in wooden. Mass of two hammers are equal. Out of the given statements which statement shows the correct hammer, and the place that it should be held in hammering a nail?

	hammer suitable for use	**Place where the hammer should be held**
(1)	P	at A
(2)	P	at B
(3)	P	middle of A and B
(4)	Q	at A
(5)	Q	at B

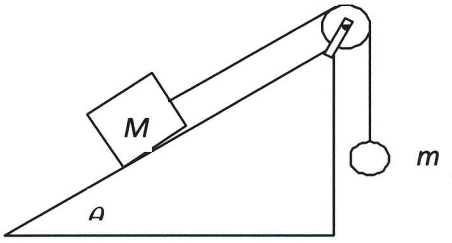
7. The figure shows five forces in one plane act on a particle at point A. The direction of motion and the resultant force of the particle is,

(1) AP දිශාවට, $9\sqrt{3}$ N
(2) $\overrightarrow{AQ}$ දිශාවට, 13.5 N
(3) $\overrightarrow{AR}$ දිශාවට, 13.5 N
(4) $\overrightarrow{AT}$ දිශාවට, 13.5 N
(5) at rest



8. The diagram shows mass M tied with a string which runsover a smooth fixed pulleyat the upper end of a rough inclined plane. A mass m tied at the free end of the string. Initially, the system is at rest, but when the angle of the inclined plane (θ) is gradually increased, at $\theta = 60^\circ$ the mass M starts to slip down along the inclined plane, if the friction of coefficient between M and inclined plane is $\frac{1}{\sqrt{3}}$, the ratio of $\frac{M}{m}$ is,

(1) $\frac{1}{\sqrt{3}}$ (2) $\sqrt{3}$ (3) $\frac{2}{\sqrt{3}}$ (4) 2 (5) $2\sqrt{3}$



9. A sun spot placed on a screen of a pinhole camera made by a student takes 5 minutes to move from one point to another. An image of a moving motor car on a race track takes 1.56 seconds to move between the same two points of same camera screen, when observed from a stage at the centre of the race track with a radius of 500 m. Then the speed of the motor car is approximately,

(1) 7 ms^{-1} (2) 12 ms^{-1} (3) 21 ms^{-1} (4) 120 ms^{-1} (5) 1200 ms^{-1}

10. What is the maximum angular velocity of a rotating plate with 20 cm radius,that the objects on the plate are not moved away when it rotates around it axel. (the coefficient of friction between the plate and the objects on it is 1/2)

(1) 1 rad s^{-1} (2) 2 rad s^{-1} (3) 3 rad s^{-1} (4) 4 rad s^{-1} (5) 5 rad s^{-1}

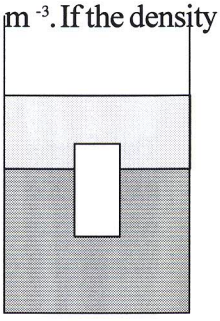
11. What is the maximum velocity of a car with 90 kw power and 500 kg mass, when it climb a hill with an inclination of 13:5 (coefficient of friction of the road is 1/3)

(1) 17 ms^{-1} (2) 20 m s^{-1} (3) 26 m s^{-1} (4) 30 m s^{-1} (5) 39 m s^{-1}

12. A spiral spring with spring constant k, compressed to distance x and placed a mass m on it and released. The maximum velocity gain by the mass is,

(1) $\sqrt{\frac{k\,x}{m}}$ (2) $\sqrt{\frac{m\,x}{k}}$ (3) $\sqrt{\frac{k\,.x}{m}}$ (4) $\frac{2\,k\,x^{2}}{m}$ (5) $\sqrt{\frac{2\,k.x}{m}}$

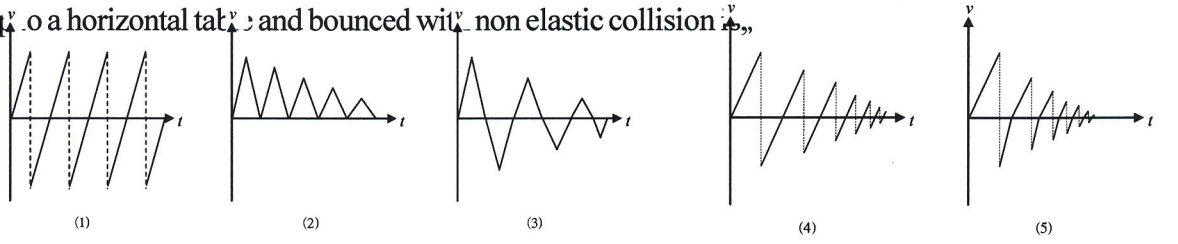
13. The diagram shows a solid wooden cylinder with a uniform cross section area floting 3/4 of it volume iimmersed in water and other 1/4 is immersed in an oil with density of 800 kg m^{-3}. If the density of water is 1000 kg m^{-3}, the density of wood is,



(1) 825 kg m^{-3} (2) 850 kg m^{-3} (3) 900 kg m^{-3}

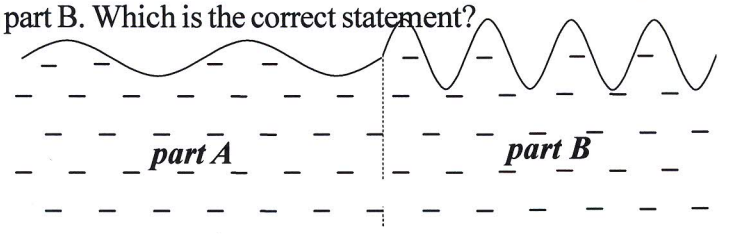
(4) 925 kg m^{-3} (5) 950 kg m^{-3}

14. With considering the air resistance, velocity - time graph of a ball droped freely from a place vertically up to a horizontal tab and bounced with non elastic collision is,



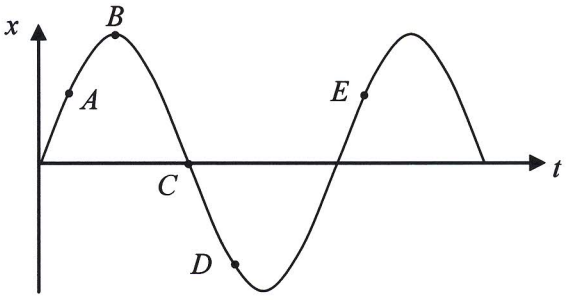
(1) (2) (3) (4) (5)

15. The diagram shows the shape of a water wave that transmitted along the water surface from part A of a pond to part B. Which is the correct statement?



(1) The depth of water at part B is lesser than at part A, the frequency of the wave is increased.
(2) The depth of water at part B is higher than at part A, energy of the wave is increased.
(3) The depth of water at part B is lesser than at part A, energy of the wave is increased.
(4) The velocity of the wave of part B is less than at part A, the frequency is high.
(5) The velocity of the wave at part B is less than part A, frequency odoes not changed.

16. The graph represents, the variation of distance against the time of a particle in a simple harmonic motion. The ratio of the potential energy (E), related to the locations of the particle would be doubled, when,



(1) $\frac{E_A}{E_C}$ (2) $\frac{E_c}{E_A}$ (3) $\frac{E_c}{E_B}$ (4) $\frac{E_c}{E_D}$

(5) $\frac{E_E}{E_D}$

17. You have given five tuning forks of frequency 270 Hz, 272 Hz, 274 Hz, 281 Hz and 286 Hz. Number of ways of selecting these tuning forks to hear beats when vibrating is,

(1) 4 (2) 5 (3) 6 (4) 8 (5) 10

18. The minimum frequency necessary for resonance is 320 Hz, when a vibrating tuning fork held over at the one end of an open pipe with 50 cm long. The minimum frequency of the tuning fork for resonance is 163 Hz after one end of the pipe is closed, according to this the end correction of the pipe and velocity of sound in air is approximately,

(1) 0.95 cm and 330 m s^{-1} (2) 0.95 cm and 332 m s^{-1}

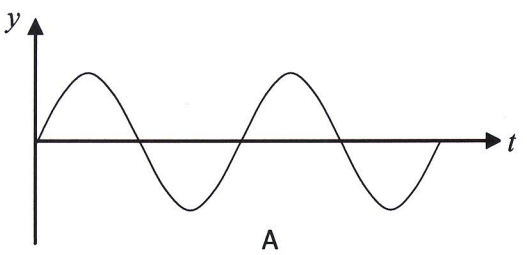
(3) 1 cm and 332 m s^{-1} (4) 1 cm and 330 m s^{-1}

(5) 0.8 cm and 333 m s^{-1}

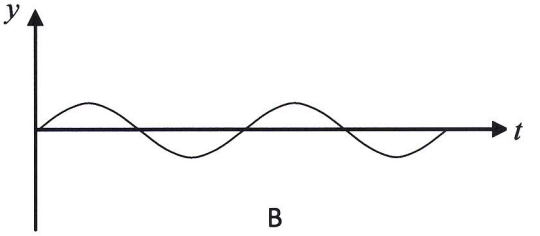
19. Two horns each frequency is 100 Hz fixed at two ends of a 1 m long bar. The bar rotates in an axis perpendicular to the bar at it centre of gravity. The frequency of beats heard by a person who is stay away from the bar is, (The sound velocity of air is 330 m s^{-1})

(1) 4 (2) 6 (3) 8 (4) 10 (5) 12

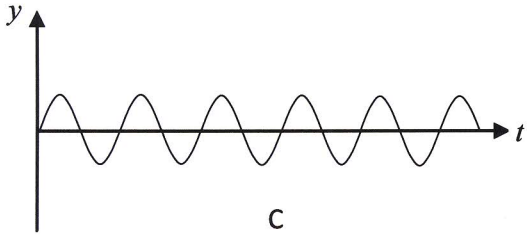
20. The diagram shows wave forms of 3 waves. Which statement in the table given below is true?



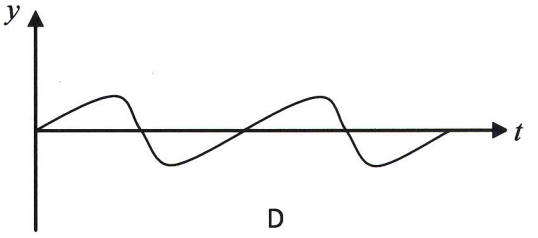
A



B



C



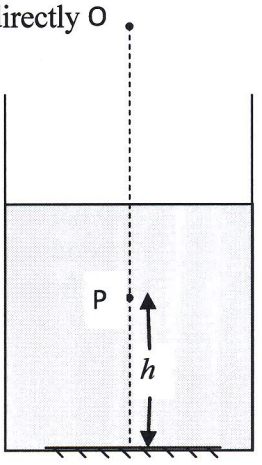
D

	Wave with high pitch	Wave with high loudness	Two waves for study the qulity of sound
1	A	A	B,D
2	B	C	A,B
3	C	A	B,D
4	D	A	B,C
5	C	C	A,B

21. A prism with refracting angle 30 ° and made by a material of refractive index 2 is silvered on one refractive surface. What is the incident angle of a light ray falls on other surface and traveled back along the same path after refection?.

(1) 60° (2) 45° (3) 30° (4) 0 (5) 15°

22. A plane mirror is placed on the floor of a container with a liquid of refractive index n. A point object P is placed above the mirror at hight h. An observer directly above the P at "O" can see two images of P. The distance between these two images is ,



(1) $2nh$ (2) $\frac{2h}{n}$ (3) $2h(n-1)$ (4) $h(1+\frac{1}{n})$

(5) $\frac{nh}{2}$

23. An under water diver in a pond want to send a message to a person on the bank of the pond by using his toarch, for this he should,

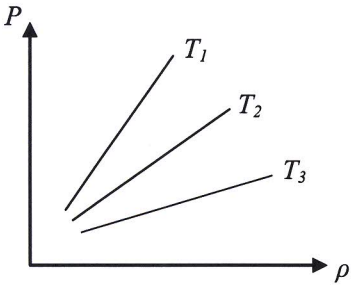
(1) direct the light vertically up.
(2) direct the light horizontally.
(3) direct the light with an angle less than the critical angle make with vertical.
(4) direct the light with an angle larger than the critical angle make with vertical.
(5) The facts are not enough to find the direction.

24. A straight line with the length of L was drawn on the objective piece of an astronomical telescope in normal adjustment. A real image of this line is formed by the eye piece and its length is l. The magnifying power of the telescope is,

(1) L/l (2) $\frac{L}{l}+1$ (3) $\frac{L}{l}-1$ (4) $\frac{L+1}{L-l}$ (5) $\frac{L-l}{L+l}$

25. If the mean depth of sea is 4×10^3 m and the coefficient of volume expansion of sea water is $2.07 \times 10^{-4}\ ^{\circ}C^{-1}$, how much the sea level is rised when the temperature increased by 1 °C,

(1) 0.3 m (2) 0.2 m (3) 0.4 m (4) 0.5 m (5) 0.6 m

26. 

The diagram shows the variation of the pressure against the density of ideal gas at three different temperatures. According to it the correct choice is,

(1) $T_1 > T_2 > T_3$ (2) $T_1 > T_3 > T_2$

(3) $T_1 < T_2 < T_3$ (4) $T_1 < T_2 < T_2$

(5) The facts are not enough.

27. Temperatures of three liquids A, B and C are 10 °C, 20 °C and 30 °C respectively. When the equal masses of A and B are mixed, the final temperature is 17 °C, after mixed the equal masses of B and C the final temperature is 28 °C. What is the final temperature after mixed the equal masses of A and C?

(1) 22°C (2) 18°C (3) 26°C (4) 27°C (5) 28°C

28. When a drop of water is put on to an iron sheet with high temperature, before evaporate the water, it converts into a spherical drop of water..The reason for this is ,

(1) Layer of water vafour formed between the drop of water and the sheet prevent the heat conduction
(2) The boiling point of water increased.
(3) The temperature droped at the place where the water drop is put.
(4) Heated sheet is a poor conductor.
(5) Both 1 and 2 are correct.

29. The W work has done by a certain ideal gas sample with U_1 internal energy is allowed to expand adiabatically. . To this,Q amount of heat supplied to the gas under content volume and the pressure as same as the initial pressure. If the new internal energy of the gas is U_2, the internal energy increase of the sample is,

(1) W (2) Q (3) W-Q (4) Q-W (5) O

30. Two copper spheres, surface of one is darkened and other is polished heated of 300 K and hung inside a vaccum chamber maintained its temperature at 273 K. Which statement given below is true?

(1) Initially heat increase rate of two spheres are same.
(2) Initially temperature of darkened sphere is dropped and temperature of other increases.
(3) Initially temperature of darkened sphere is droped increases and droped in other sphere.
(4) At the end value of the temperature of two spheres and chamber are same.
(5) At the end value of temperature of two spheres are same and the chamber has different value.

31. A partical moved from point x to point y in a gravitational field,
(A) Change of gravitational potential is independent from the path between x and y.
(B) The kinetic energy change of the partical at x and y is equal to potential energy change.
(C) The potential energy change is independent from the mass of the particle.

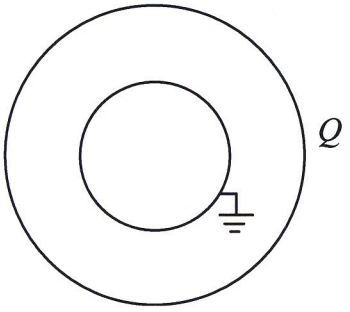
The correct statemet/ statements from above is/are

(1) A only (2) B only (3) A and B only (4) B and C only
(5) All A,B,C

32. Water drops with a radius of r fall into a spherical metal container radius of R from a container of water which potential is maintained as V. The metal container is placed on an insulated sheet. The potential of the sphere afetr filled with water is,

(1) $\frac{RV}{r}$ (2) $\frac{rV}{R}$ (3) $\frac{r^2}{R^2}$ (4) $\frac{R^2V}{r^2}$ (5) $\frac{r^2V}{R^2}$

33.

33. 

Radiai of two concentric spherical conductors that shown in the diagrame are a and b. If the inner sphere is earthed and charge Q is given to the outer sphere, the charge on the surface of two spheres are,

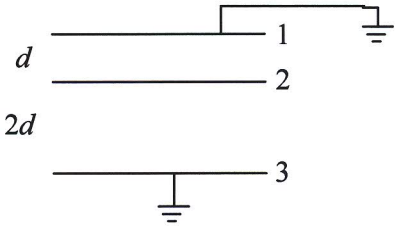
(1) -aQ/b (2) -bQ/a (3) -Q

(4) 0 (5) aQ/b

34. From the three unique metal plate system shown in the diagrame the upper and the lower plates are earthed, and Q charge is given to the middle plate. The potential of the middle plate is,

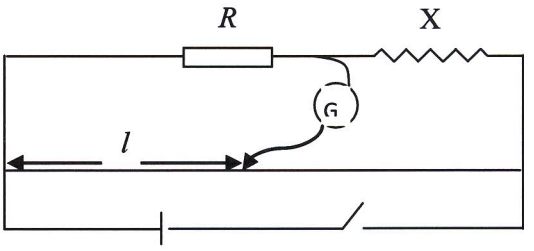
(1) $\frac{3Qd}{2\varepsilon_0 A}$ (2) $\frac{Qd}{\varepsilon_0 A}$ (3) $\frac{2Qd}{3\varepsilon_0 A}$

(4) $\frac{3Qd}{\varepsilon_0 A}$ (5) $\frac{2Qd}{\varepsilon_0 A}$



35. The table given below represents some R and I readings for meter bridge scale shown in the diagrame.

Instances	R / Q	l / m
1	1000	60
2	100	13
3	10	1.5
4	1	1



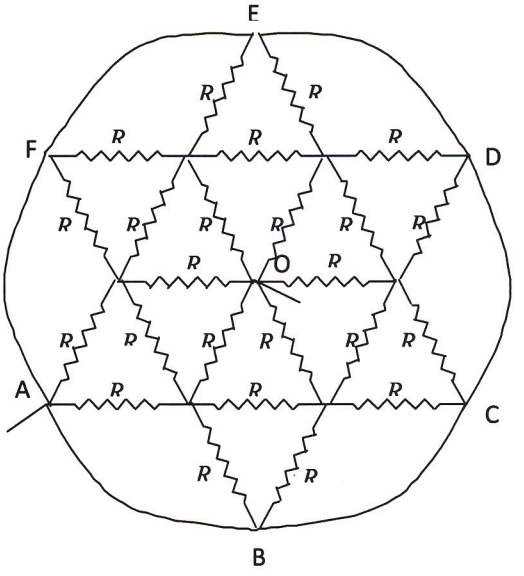
Which pair of reading in the table is not get correctly.

(1) 1 (2) 2 (3) 3 (4) 4 (5) All are correct.

36. If resistance of each resister is R of the circuit shown in the diagram, the equivalent resistance across A, O is

(1) 2 R (2) $\frac{3R}{}$ (3) R

(4) R / 2 (5) R/4



37. Consider the following statements related to an instance of a voltmeter connect across a cell.

(A) When only the electric cell and the voltmeter are completed the voltmeter reading is equal to the electro motion force.

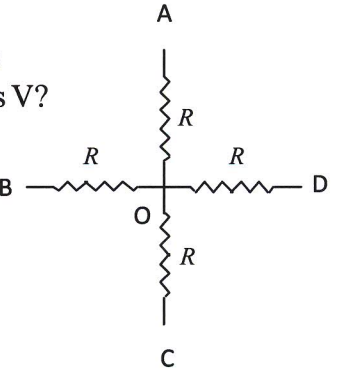
(B) When only the electric cell and the voltmeter are not completed,the voltmeter reading is not equal to the electro motion force.

(C) When either of the voltmeter or the electric cell is completed , the reading is equal to the electro motion force.

The accurate statement/s of the above,

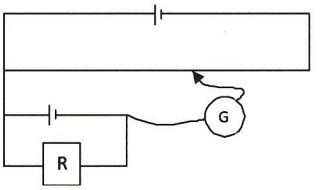
(1) A Only (2) C Only (3) A and B Only (4) B and C Only (5) A and C Only

38. The potential of A, B and C is equal in the resistor system shown in the diagram. What is potential across OD if the potential across B and D is V?



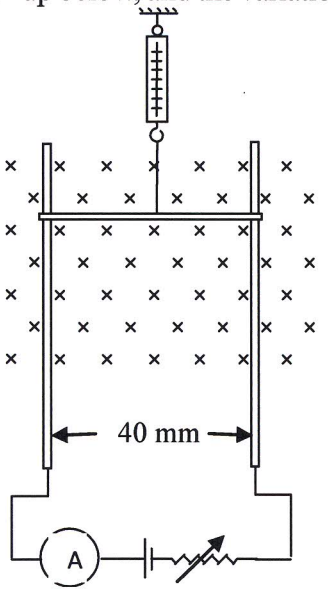
(1) 0.75 V (2) 0.5 V (3) 0.25 V
(4) 2 V (5) V

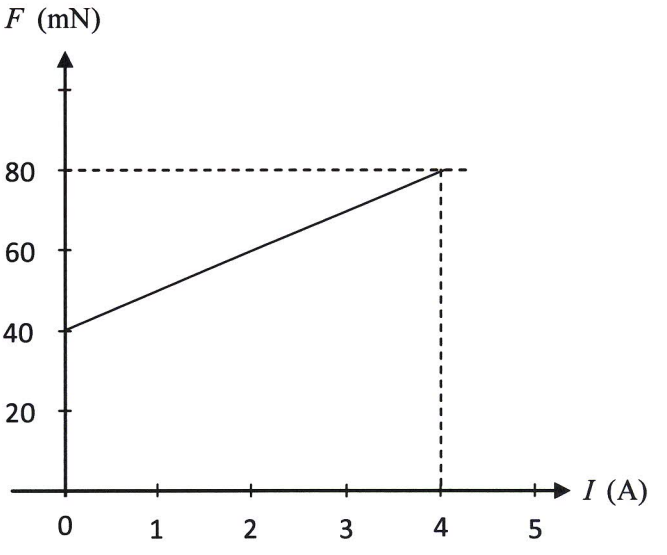
39. In a practical of measuring internal resistance of a cell the balance length of a potentiometer shown in the diagram is 60 cm when the value of R is 3 Ω and the balance length is 80 cm when the value of R is 5 Ω. The internal resistance of the cell is,



(1) 0. 5 Ω (2) 1 Ω (3) 1. 5 Ω (4) 5 Ω (5) 10 Ω

40. The linear conductor which is kept to slide along two conducting rails of 40 cm apart, is hung by a spring balance. The current flowing, when variable voltage is supplied across the rails as shown in the set - up below, and the variation of the spring balance reading is shown in the graph.





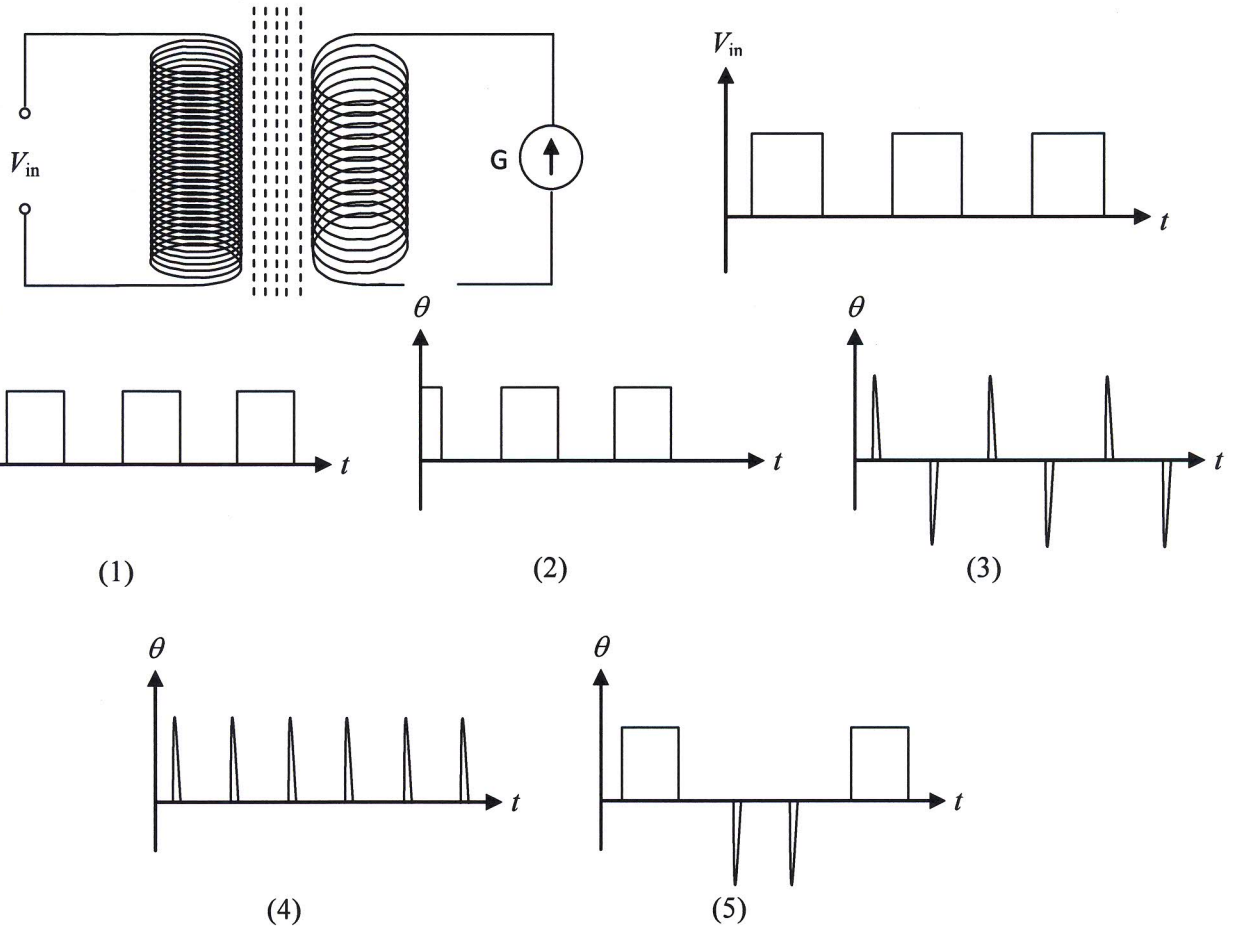
Then the magnetic flux density of the magnetic field is

(1) 0. 2 T (2) 0. 25 T (3) 0. 5 T (4) 1 T (5) 2. 5 T

41. When an electric current flows vertically upward in a vertical conductor near the earth surface, the direction of the magnetic flux density in the points south west to it is,

(1) to North East (2) to North West (3) to South West
(4) to North (5) to South

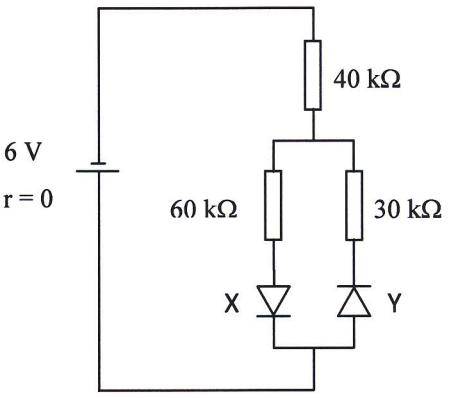
42. The graph shows the variation of the input voltage (Vin) supplied to the primary coil of the transformer shown in the diagram. The variation against the time and deflection (θ) of the center zero galvanometer connected to a secondary coil is correctly represented by the graph,



43. A rod shaped conductor placed horizontally toward East and West at the height of h and dropped freely. The induced voltage and the current flow through the rod. just before to reach the ground is, (The horizontal and the vertical components of the magnetic flux density is B_1, and B_2)

(1) $B_1 l\sqrt{2gh}$ and $B_1 l\sqrt{2gh}/2$
(2) $B_2 l\sqrt{2gh}$ and $B_2 l\sqrt{2gh}/R$
(3) $\sqrt{B_1^2 + B_2^2} \cdot l\sqrt{2gh}$ and $\sqrt{B_1^2 + B_2^2}\, l\sqrt{2gh}$
(4) $B_1 l\sqrt{2gh}$, and O
(5) $B_2 l\sqrt{2gh}$, and O

44. X and Y are two silicon diodes with potential barrior 0.7 V. The e.mf. of the cell is 6 V and its internal resistence is negligible. According to this the voltage difference across diode Y is,



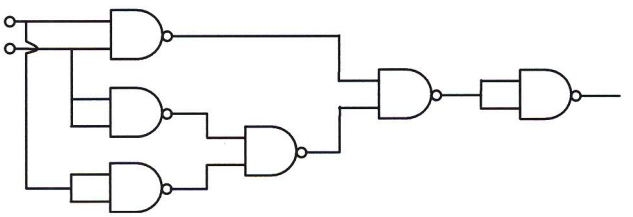
(1) 0.7 V (2) 2.12 V (3) 3.18 V

(4) 3.88 V (5) 0 V

45. The current gain of a transistor in common emitter mode ß = 99 and the emitter current 2 mA, the collector current is,

(1) 20 μ A (2) 19.8 μ A (3) 19.8 mA (4) 1.98 mA (5) 20 mA

46. The equivalent single logic gate to the logic gate circuit shown in the diagram is,



(1) AND (2) NAND (3) NOR (4) .OR (5) EXOR

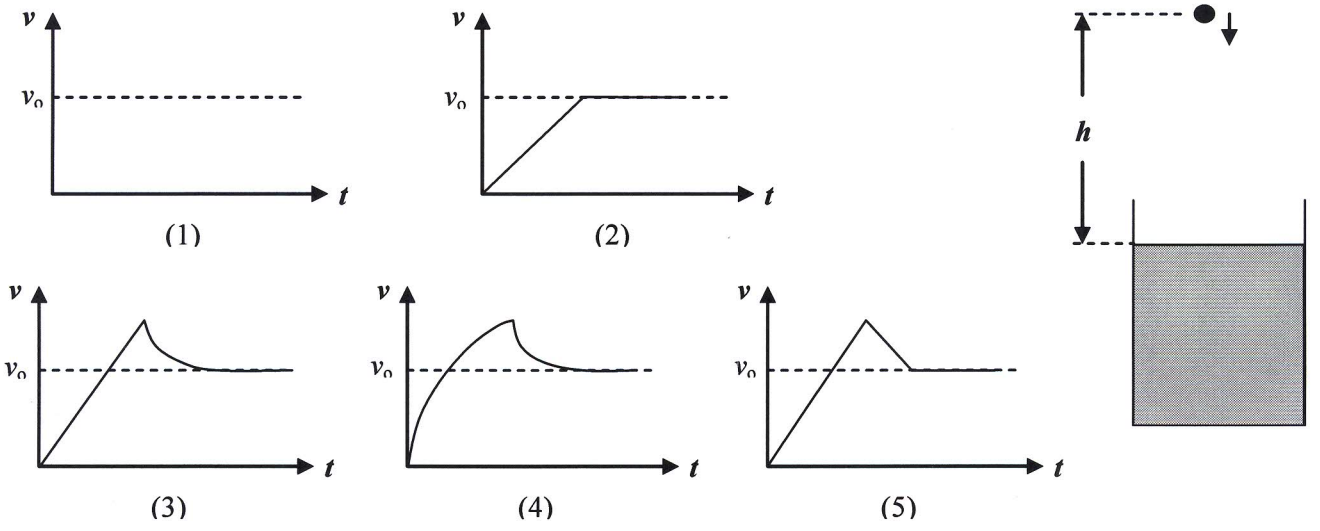
47. One end of a string with Young modulus Y, length l and cross section area is a, tied to the point O. The other end of the string is tied to a mass m. Mass m is brought to the position O and released freely. The distance that mass m traveled when it achieved the maximum velocity is,

(1) l (2) mgl/Ya (3) Yal/mg (4) l [1 + (Yg/mg)] (5) l [1 + (mg/Ya)]

48. When a capilary tube with radius r is immersed into a liquid whose surface tension T and density ρ, a column of liquid with hight h rises through the tube. (Angle of contact of this is θ). Taken out the tube vertically and fill same liquid up to hight h, the radius of the miniscus of tower end of the tube is,

(1) r (2) $r \cos\theta$ (3) $\frac{r}{\cos\theta}$ (4) $\frac{2T\cos\theta}{h\rho g}$ (5) infinity

49. A sphere with density is higher than water droped from the hight h from the surface of water in a tall water vesel. If the terminal velocity of sphere in water $Vo < 2gh$, the graph shown the change of the velocity of sphere against the time is,



50. Atomic mass of a radio active element with half life time T is M. If the Baltsman constant is k the activity of mass mo of radio active element is,

(1) $\frac{moMR\ ln}{TK}$ (2) $\frac{moR\ ln\ 2}{MKT}$ (3) $\frac{MR\ ln\ 2}{moKT}$ (4) $\frac{moRT}{MK\ ln\ 2}$

(5) $\frac{moR}{MK}$