KIIRA COLLEGE BUTIKI

Uganda Certificate of Education

PHYSICS

Paper 1

Acceleration due to gravity, = $10\ ms^{-2}$
Specific heat capacity of water = $4200\ J\ kg^{-1}\ K^{-1}$
Specific latent heat of steam = $226000J\ kg^{-1}$

SECTION A

1. Which of the following is likely to take place when a substance loses heat?
   A. Melting
   B. Boiling
   C. Evaporation
   D. Condensation

2. Fig 1

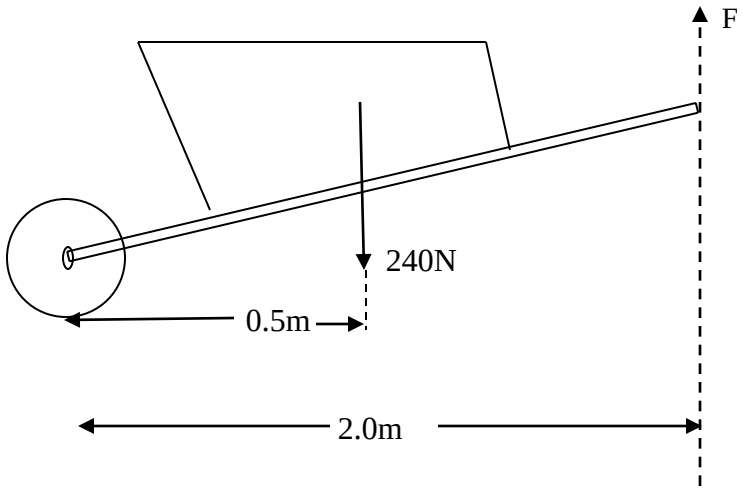


Figure 1 shows a wheelbarrow being used to carry building materials. Calculate the minimum force if the total weight of the wheelbarrow and its contents is 240N

   A. 960N
   B. 240N
   C. 60N

D. 4.8N

3. Which of the following is likely to happen when a person suddenly jumps off a rowing boat to the bank of a river?
The boat will
   A. move side ways
   B. move backwards
   C. remain stationary
   D. move towards the bank

4. What is the nature of the image of an object placed perpendicularly on the principal axis of a concave mirror of radius of curvature 20cm at a distance of 8cm from the mirror?
   A. Virtual, magnified, upright, behind the, mirror
   B. Real, magnified upright, behind the mirror
   C. Virtual diminished inverted, behind the mirror
   D. Real, diminished, inverte behind the mirror

5. The length of the mercury thread in an ungraduated thermometer is 5.0cm at ice point and 13.6cm at a temperature of 48^{o}c. What will be the length of the mercury column at steam point?
   A. 68.0cm
   B. 17.9cm
   C. 9.6cm
   D. 3.5cm

6. Fig 2

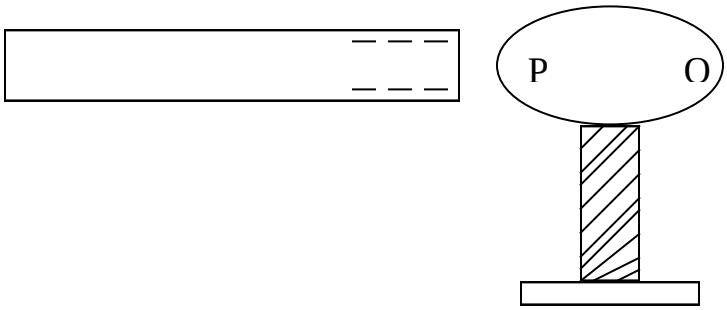
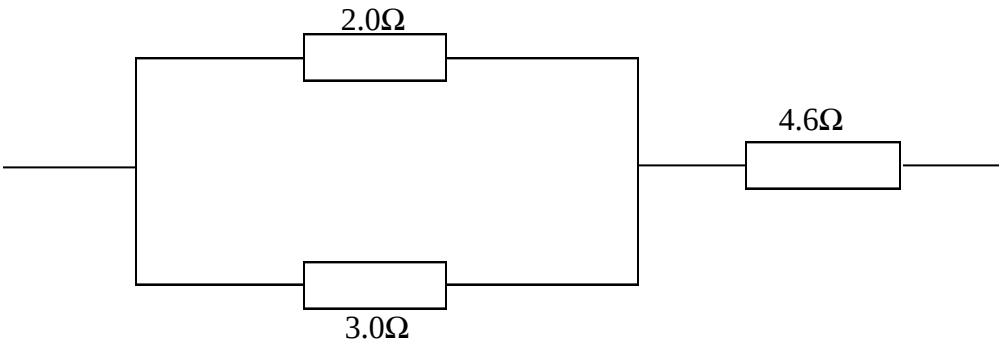


Figure 2 shows a negatively charged rod brought close to a conductor PQ which is on an insulating support. Which of the following statements is true about what happens?

A. Positive charge is repelled to end Q leaving end P with a negative charge.
B. Negative charge is attracted to end P leaving end Q with a positive charge.
C. Negative charge is repelled to end Q leaving end P with a positive charge.
D. Positive charge is spread all over the surface of the conductor.

7. Figure 3



Three resistors of 2.0Ω, 3.0Ω and 4.6Ω are connected in a circuit as shown in figure 3. Find the combined resistance.

A. 27.6 Ω
B. 9.6 Ω
C. 6.9 Ω
D. 5.8 Ω

8. The following are ways of making a magnet except

A. Heating
B. Single stroke
C. Double stroke
D. Electrical method using d.c

9. The SI unit of length is the

A. millimeter

B. centrimetre

C. kilo metre

D. metre

10. The following are mechanical waves except

A. earth quakes

B. infrared

C. water waves

D. sound waves

11. Which of the following is/are applications of X-rays

(i) Locating unusual objects in the human body

(ii) Detecting blood clots in the body

(iii) Detecting flaws in metal castings and welded joints

A. (i) only

B. (i) and (ii) only

C. (i) and (iii) only

D. (ii) and (iii) only

12. Figure 4

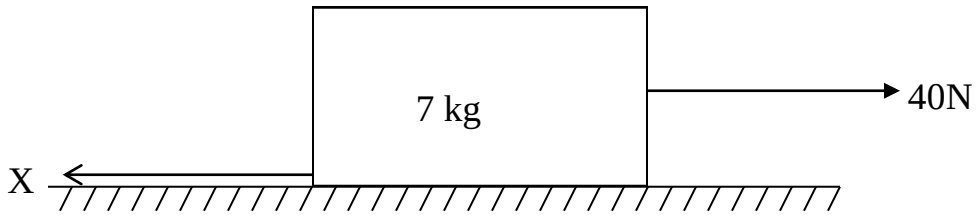


Figure 4 shows a block of mass 7kg resting on a rough surface. A force of 40N produces an acceleration of $4ms^{-2}$ on the block. Find the value of the frictional force X.

A. 7.0N

B. 12.0N

C. 33.0N

D. 40.0N

13. A car starting from rest is uniformly accelerated at a rate of $3.5ms^{-2}$ for 8 seconds. It maintains the velocity reached for ten seconds and is finally

retarded uniformly to rest within another ten seconds. Calculate the total distance travelled.

A. 229m

B. 532m

C. 820m

D. 2800m

14. An immersion heater of power 600W takes 40seconds to melt 71.6g of ice at 0^{o}c. Find the specific latent fusion of ice.

A. $1720000JKg^{-1}$

B. $838000JKg^{-1}$

C. $477600JKg^{-1}$

D. $335000JKg^{-1}$

15. Which of the following instruments is used for measuring pressure of a gas?

A. Burdon gauge

B. Hydrometer

C. Hypsometer

D. Manometer

16. What is observed when a positively charged rod is brought near the cap of a positively charged gold leaf electroscope?

A. The leaf divergence, increases

B. The leaf divergence degreases

C. The leaf divergence is uncharged

D. The leaf collapses then diverges.

17. The resistance of a metal increases when

(i) the cross-sectional area is increased

(ii) the length is increased

(ii) the temperature is increased

A. (i) and (ii) only

B. (i) and (iii) only

C. (ii) and (iii) only

D. (i) (ii) and (iii)

18. Which of the following shows the correct order of increasing ionizing power of radiations?

A. gamma → beta → alpha

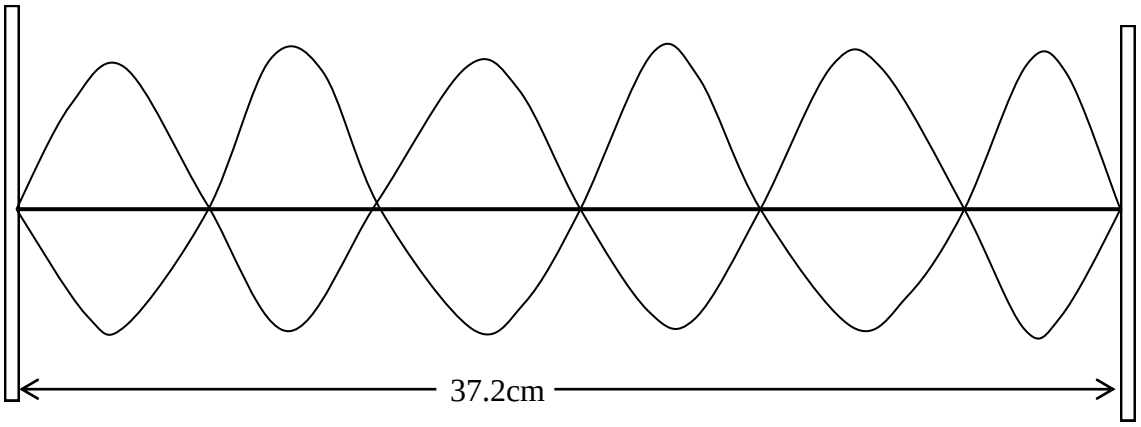
B. gamma → salpha → beta

C. alpha → beta → gamma

D. beta → alpha → gamma

19. Fig 5

What is the wavelength of the wave mentioned in figure 5?



A. 6.2cm

B. 18.6cm

C. 12.4cm

D. 37.2cm

20. In a simple d.c electric motor the function of the commutator is to

A. Connect the bruches together

B. Reverse the magnetic field

C. Increase the current strength

D. Change the current direction in the coil.

21. A ball of mass 0.5kg moves with a velocity of 8ms-1. What is its kinetic energy?

A. 32J

B. 8J

C. 4J

D. 2J

22. A block and tackle system used to lift 600N has three pulleys in the upper block and two pulleys in the lower block. Find the efficiency of the system if an effort of 140N is applied.

A. 23.3%

B. 75%

C. 80%

D. 85.7%

23. Which of the following is/are ways of reducing notch effect.

(i) smoothening the surface

(ii) subjecting the notch side to tension

(iii) Subjecting the notch side to compression

A. (i) and (ii) only

B. (i) and (iii) only

C. (ii) and (iii) only

D. (i), (ii) and (iii) are correct

24. Fig 5

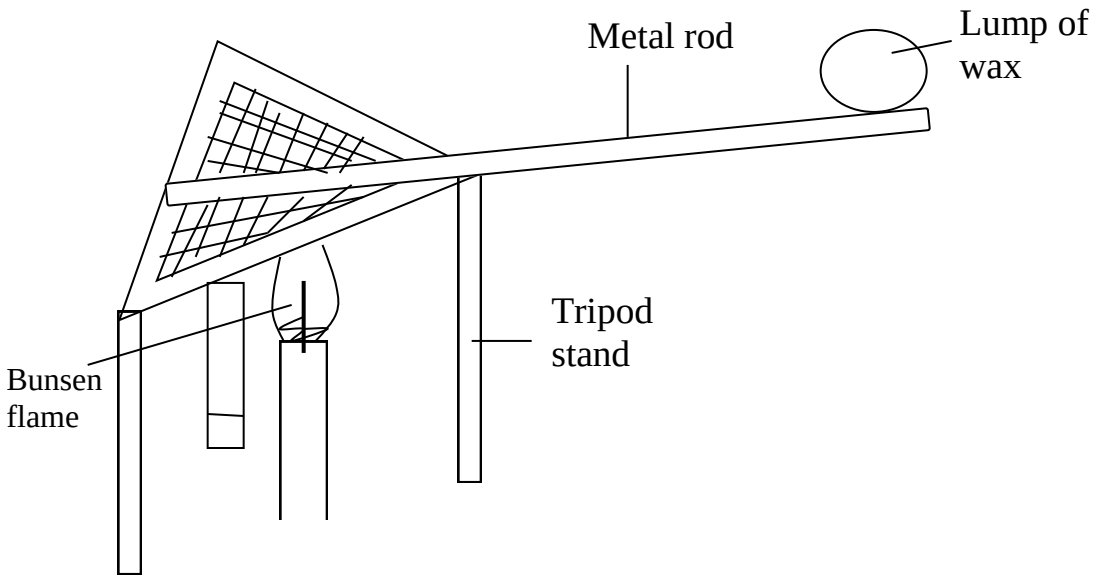


Figure 5 shows a metal rod having a lump of wax at one end and the other end placed on a tripod stand which is heated from below. What will be observed after a few minutes?

A. The wax drops off the metal rod
B. The Bunsen flame is blown off
C. The metal rod melts
D. The wax melts

25. A freely suspended magnet will
A. swing continuously
B. swing for a short time and stop
C. rotate until it rests in the north – south direction
D. rotate endlessly until it loses its magnetism

26. What is the electric energy generated when a bulb rated 240V operates normally for half a minute as current of 0.2A flows?
A. 144J
B. 720J
C. 480J
D. 40J

27. What volume is occupied by a gas at 2 ½ atmospheres if its volume at 1 atmosphere is $48cm^3$
A. 480cm3
B. 120cm3
C. 19.2cm3
D. 4.8cm3

28. An object of volume $20cm^3$ weighs 0.98N in air. What will be its weight when completely immersed in sea water of density $1.05gcm^3$
A. 0.77N
B. 0.98N
C. 1.19N
D. 2.03N

29. A steel rod of length 100m and linear expansivity 0.00012 K^{-1} is heated through a temperature of 50^{o}c. What is the new length?
    A. Th100.12m
    B. 100.6m
    C. 112m
    D. 150m

30. The figure 49.96 can be written to three significant figures as
    A. 49.9
    B. 50.6
    C. 50.0
    D. 50.9

31. The rainbow is seen when
    A. the source of light is between the observer and the refracting medium.
    B. The source of light is at the same level as the observer and the refracting medium.
    C. The observer and the source light are at the same level.
    D. The observer is between the source of light and the refracting medium.

32. The meter reading of a certain house was 4694 on 30th July 1996 and 4796 on 30th August the same year. What was the cost of consumption of electricity if one unit was rated at shs. 180?
    A. Sh.18360
    B. Sh.54000
    C. Sh.844920
    D. Sh.863280

33. Fig 7

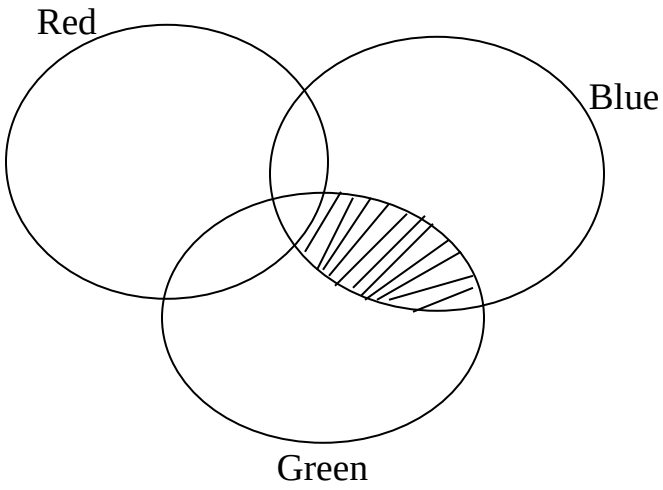


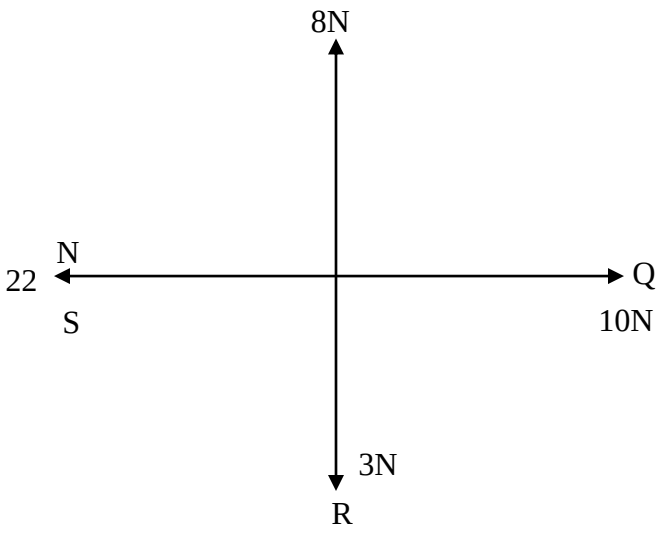
Figure seven is a venn diagram showing how coloured light mixes by addition. Which of the following colours is represented by the shaded region?

A. Magenta
B. Yellow
C. White
D. Cyan

34. Which of the following materials can be used to make a temporary magnet?

A. Zinc
B. Iron
C. Steel
D. Nickel

35. Four forces act on an object such that P is N, Q is 10N, R is 3N and S is 2N as shown in the diagram figure 8.



What is the resultant force on the body?

A. 11N B. 13N

A. 17N D. 44N

36. When two vehicles collide passengers are usually injured by hitting the windscreen because of

A. action and reaction forces

B. momentum

C. inertia

D. impulse

37. Which of the following will result in increased disturbance of two identical sources of progressive waves a small distance apart?

A. Crest superimposes a trough

B. Compression superimposes a rare faction

C. Crest of one wave leads a crest of another

D. A trough of one wave superimpose a trough of another.

38. Which of the following happens when a person walks towards a plane mirror with a speed of $0.6ms^{-1}$?

A. The image appears to walk towards the mirror with the same speed.

B. The image appears to walk away from the mirror with the same speed

C. The image moves sideways with the same speed

D. The image remains stationary.

39. The sensitivity of a thermometer is increased by

(i) decreasing the size of the bore

(ii) Increasing the length of the stem

(iii) making the wall of the bulb thin

A. (i) only

B. (i) and (ii) only

C. (i) and (iii) only

D. (i), (ii) and (iii)

40. A galvanometer has full-scale deflection of 5 mA and resistance 15Ω. Find the value of resistor required to modify it to measure currents up to 2A.

A. 0.020 Ω

B. 0.038 Ω

C. 15.04 Ω

D. 59.85 Ω

SECTION B

41. (a) Distinguish between velocity and acceleration. (1 ½ marks)

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(b) A wooden trolly is attached to a ticker-timer of frequency 50Hz and covers a distance of 24.0cm for the first ten dots and 38.0cm for the next ten dots. Calculate the acceleration of the trolley in ms^{-2}. (2 marks)

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(c) State one applications of the law of conservation of linear momentum. (½ mark)

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42. (a) What is meant by upthrust? (½ mark)

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(b) Find the resulting density of an alloy containing $400cm^3$ of metal X of density $4.8gcm^{-3}$ and $100cm^3$ of a metal Y of density $8.9gcm^{-3}$.

(2 marks)

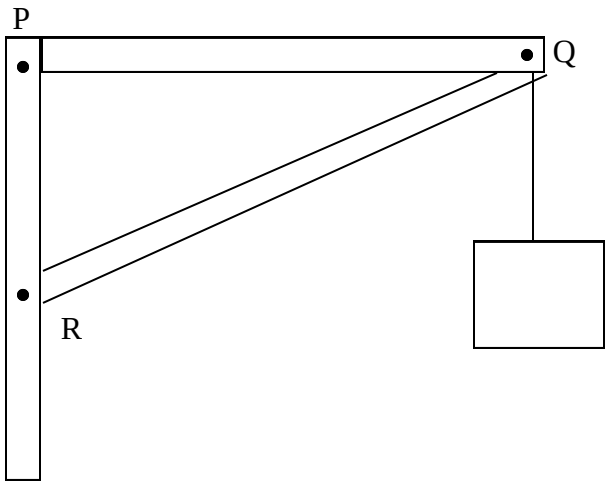
(c) State two applications of the Bernoulli effect. (1 marks)

43. (a) Define the following terms as applied to materials:

(i) Ductility (1 mark)

(ii) Stiffness (1 mark)

(b) Fig 9



In figure 9, identify

(i) a tie _____(½ mark)

(ii) a shut_____ (½ mark)

(c) How can the properties of concrete be improved when making a block to be used on the second floor of a storeyed building? (1 mark)

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44. (a) How is the pressure exerted by a liquid affected by increase of depth? (1 mark)

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(b) A person of mass 60kg wears shoes of total mass 0.200kg. Calculate the pressure exerted on the ground if the area of contact between each shoe and the gound is $25cm^2$. (2 marks)

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(c) Give two practical applications of atmospheric pressure. (1 mark)

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45. (a) Define atomic number. (1 mark)

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(b) How does beta decay affect the nucleas of an atom? (1 mark)

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(c) Find the mass of the original sample of a radio active nuclide of half life 57 days after a period of 228 days. (2 marks)

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46. (a) State four ways of heat transfer. (1 mark for all)

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(b) Explain why a concrete floor feels older to the feet than a carpeted floor. (1 ½ marks)

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(c) Calculate the thermal heat required to convert 2kg of ice at 0^{o}c to water at 20^{o}c.

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47. (a) What is meant by a beam of light? (1 ½ marks)

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(b) Give two properties of images formed by diverging mirrors. (1 mark)

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(c) A ray of light is incident on an angle of 40^{o}. Find the angle of refraction if the refractive index of water is $\frac{4}{3}$ (2 marks)

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48. (a) Distinguish between a primary cell and a secondary cell. (2 marks)

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(b) Fig 10

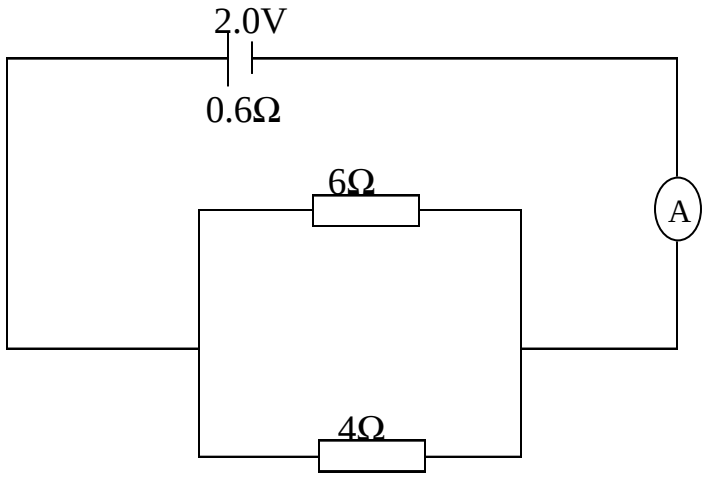

Figure 10 shows a battery of e.m.f 2.0V connected to a 6Ω and a 4Ω resistors. Find the ammeter reading if the internal resistance of the battery is 0.6 Ω. (2 marks)

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49. (a) Define transverse wave motion and give one example. (1 mark)

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(b) A musical instrument produces a sound note of frequency 484Hz. Calculate the wavelength of the note if, the velocity of sound in air is $330ms^{-1}$ (2 marks)

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50. (a) State Faraday's law of electro magnetic induction. (1 mark)

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(b) Sketch a graph of voltage against time of an alternating current generator. (1 mark)

(c) A step-down transformer has 5000 turns in the primary coil and 800 turns in the secondary coil. What is the voltage in the secondary coil when the primary coil is connected to a 240V supply. (2 marks)

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