



WESTERN JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

Physics

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES.

- Section A contains 40 objective type questions. You are required to write the correct answer A, B, C or D against each question in the box on the right hand side.
- Section B contains 10 structured questions
- Use the following values where necessary
- Acceleration due to gravity = 10ms^{-2}
- Density of water = 1000kgm^{-3}
- Specific heat capacity of water = $4200\text{Jkg}^{-1}\text{K}^{-1}$
- Specific latent heat of fusion of water = $3.5 \times 10^5\text{Jkg}^{-1}$

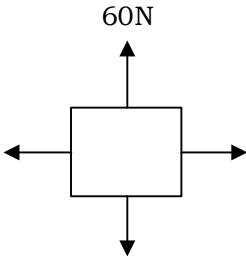
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MCQ	Q41	Q42	Q43	Q44	Q45	Q46	Q47	Q48	Q49	TOTAL

SECTION A: (40 MARKS)

Answer all questions in this section.

1. Which one of the following groups consists of vectors only?
 A. Force, weight, work, energy B. Velocity, displacement, acceleration, weight
 C. Momentum, power, work, energy D. Velocity, work, power, energy. ☐
2. Liquid X of volume 0.5m^3 and density 900kgm^{-3} was mixed with liquid Y of volume 0.4m^3 and density 800kgm^{-3} . What was the density of the mixture?
 A. 8500kgm^{-3} B. 1889kgm^{-3} C. 770kgm^{-3} D. 856kgm^{-3} ☐
3. An object is placed 20cm in front of a plane mirror. If the object is moved a distance 5cm towards the mirror, find the distance between the object and the image.
 A. 30cm B. 10cm C. 40cm D. 35cm ☐
4. Figure 1 below shows forces of 80N, 40N, 60N and 40N acting on a body.
 Fig. 1 In which direction does the body move?



A. To the left

B. To the right

C. Downwards

D. upwards

☐
5. Soap is used to wash clothes because it;-
 A. Increases surface tension allowing water to penetrate the dirt more easily.
 B. Increases capillarity in the clothes.
 C. Reduces surface tension allowing water to penetrate the dirt more easily.
 D. Increases capillarity in the clothes. ☐
6. In a ripple tank, destructive interference occurs when;
 A. The wave is stationary C. The wave meets an obstacle
 B. A crest overlaps a crest D. A crest overlaps with a trough ☐
7. Which one of the following shows the correct stages in an internal combustion of a petrol engine?
 A. Power \longrightarrow Compression \longrightarrow Intake \longrightarrow Exhaust
 B. Compression \longrightarrow Intake \longrightarrow Exhaust \longrightarrow Power
 C. Intake \longrightarrow Compression \longrightarrow Power \longrightarrow Exhaust
 D. Intake \longrightarrow Compression \longrightarrow Exhaust ☐
8. The resistance of the filament of a bulb rated at 240V, 60W is
 A. 960 ohms B. 4 ohms C. 0.25 ohms D. 14400 ohms ☐
9. The lowest possible temperature on the Kelvin scale is called the;-
 A. Steam point B. Dew point C. Ice point D.. Absolute Zero ☐
10. A radio-active material has a half-life of 2minutes. Find how long it takes a sample of mass 800g to decay to 25g.
 A. 24minutes B. 10minutes C. 32minutes D. 16minutes ☐
11. A tuning fork of frequency 610Hz is producing a sound wave whose velocity is 330ms^{-1} . What is the wave length of the sound wave?
 A. 540m B. 185m C. 1.85m D. 0.54m ☐
12. An object is placed between the focal point and the centre of curvature of a concave mirror. Which of the following fully describes the image formed?
 A. Real, inverted, magnified C. Real, inverted, diminished ☐

B. Virtual, erect, magnified

D. Real, erect, diminished.

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13. A B-52 bomber fighter aircraft drops a bomb that takes 80seconds to reach the target and destroy the rebel hideout. Find how far up the sky is the bomber air craft.

A. 32M B. 320M C. 32000M D. 3200M

☐

14. Soft magnetic materials are materials which;

A. Can be magnified easily.

C. Can break easily

B. Can retain their magnetism for a long time D. Cannot be attracted by a magnet

15. Which of the following statements is NOT true about pressure in liquids?

A. It increases with depth

C. It is the same throughout the liquid

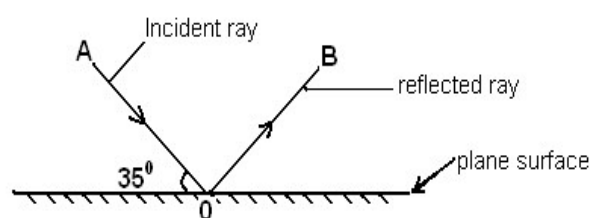
B. It is lowest at the surface

D. It acts equally in all directions.

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16. In figure 2 below, a ray of light **AO** incident on a plane surface is reflected along **OB**, shown below;-

Fig. 2



The angle of reflection is;

A. 60°

B. 35°

C. 40°

D. 55°

☐☐

17. An observer hears an echo of a gun he has fired, 4 seconds after being reflected from a high wall which is 770metres away. The velocity of sound in air is;

A. 385ms^{-1}

B. 375ms^{-1}

C. 192.5ms^{-1}

D. 3080ms^{-1}

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18. The reciprocal of the focal length expressed in metres, is known as;-

A. The diopetre of a lens.

C. the magnification of a lens

B. The focus of a lens

D. the power of a lens

☐

19. Madam Rachael is holding a green paper with red printings on it. If she enters a room with green light, she will be seeing;-

A. Green printings on a red paper

C. Printings on a red paper

B. Green printings on a green paper

D. Yellow printing on a green paper

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20. A Charge of 6 coulombs flows steadily through a 5 ohm resistor in 2 seconds. The current in amperes is;

A. 3

B. 6

C. 15

D. 12

☐

21. The force which holds water molecules together with the molecules of glass when water drops remain on glass is;-

A. Cohesion

B. Adhesion

C. Capillarity

D. Surface tension

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22. A girl is standing in front of two mirrors inclined at an angle of 30° to each other. How many images of the girl can be seen?

A. 11

B. 12

C. 9

D. 6

☐

23. ${}_{90}^{228}\text{Th} \longrightarrow + \text{Alpha particle.}$

The above equation represents an activity in which thorium decays emitting an alpha particle. Find the value of Z.

A. 94

B. 92

C. 88

D. 89

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24. A machine lifts a load of 200g through a vertical height of 10M in 2seconds. Find the power produced in watts.

A. 10

B. 1000

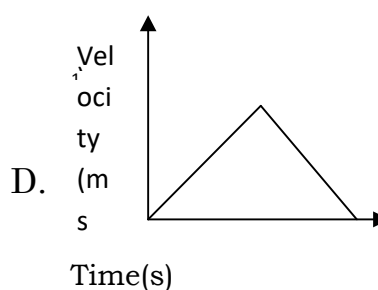
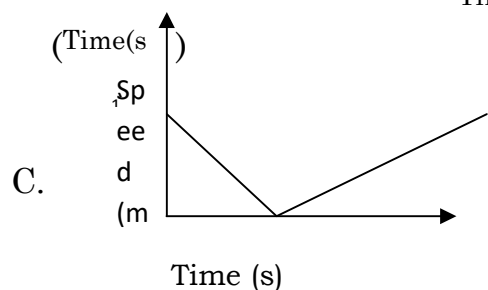
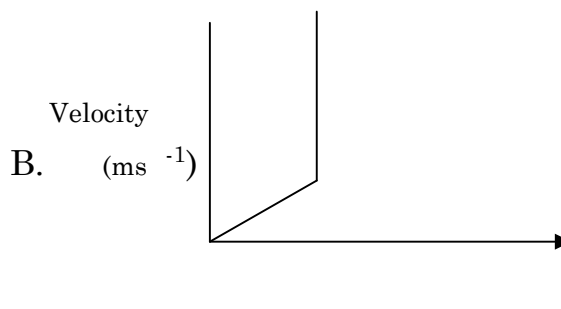
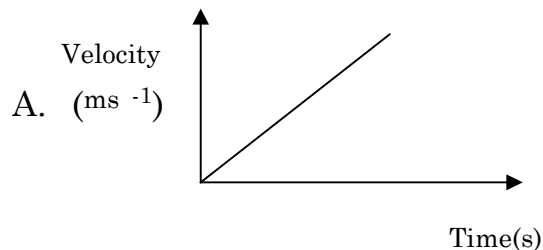
C. 20

D. 40

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25. Which of the following graphs represents a speed against time graph for

a body thrown vertically upwards?


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26. When an accumulator is being charged;

- A. Chemical energy is being converted into electrical energy.
 B. Potential energy is being converted into chemical energy.
 C. Potential energy is being converted into electrical energy.
 D. Electrical energy is being converted into chemical energy.

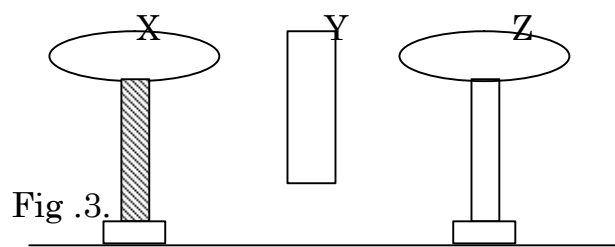
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27. A car starts from rest and accelerates uniformly at a rate of 80ms^{-2} . Find the time it takes to cover a distance of 640M.

- A. 4 seconds B. 8 seconds C. 0.125 seconds D. 25seconds

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28. Figure 3 shows a charged rod **Y** brought between two nearby conductors **X** and **Z**.


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If Y is removed from that position and Z is positively charged, then the charges on X and y are;

- A. $\begin{matrix} \text{X} & \text{Y} \\ - & - \end{matrix}$ C. $\begin{matrix} \text{Y} & \text{X} \\ + & - \end{matrix}$
 B. $\begin{matrix} - & + \end{matrix}$ D. $\begin{matrix} + & + \end{matrix}$

☐

29. A body of mass 60kg weighs 390N on planet K. Which one of the following statements is true?

- A. The mass of the body is less on earth than it is on K.
 B. The acceleration due to gravity on K is less than it is on the earth.
 C. The acceleration due to gravity on earth is less than it is on K.
 D. The mass of the body is less on K than it is on earth.

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30. A straight line through the origin of a velocity time graph shows that the;

- A. Motion is a retardation B. The acceleration is uniform
 B. Velocity is uniform D. Distance is increasing uniformly

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31. The cost of one unit of electrical energy is shs.570. Find the cost of using five 100W lamps for 4 hours.

- A. Sh.1040 B. Sh.14250 C. sh.2850 D. sh.114

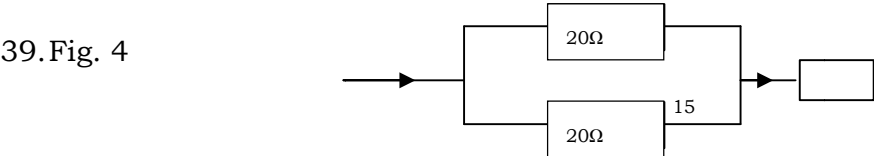
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32. The number of vibrations a wave makes in one second is the;-

- A. Wave length B. amplitude C. Frequency D. Period

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33. Calculate the quantity of heat required to change 200g of steam at 100°C to water at 100°C (specific latent heat of vaporization is $2.26 \times 10^6 \text{ Jkg}^{-1}$). ☐
 A. $4.152 \times 10^{-5} \text{ J}$ B. 4.52J C. $4.52 \times 10^6 \text{ J}$ D. $4.52 \times 10^5 \text{ J}$
34. A 240V mains transformer has 1000 turns in the primary. Find the number of turns in the secondary if it is used to supply a 12V, 24W Lamp. ☐
 A. 1000 B. 2000 C. 500 D. 50
35. The effect produced when many echoes merge into one prolonged sound is known as;- ☐
 A. Harmonics B. Pitch C. Reverberation D. Noise
36. A stick with one end immersed in water appears bent at the surface of water because of;- ☐
 A. Interference B. Reflection C. Refraction D. Diffraction
37. Sound travels much faster through; ☐
 A. Water B. Nitrogen gas C. Wood D. Steel
38. The three fundamental physical quantities are;-
 A. Mass, weight and force. B. Length, Mass and time C. Mass, time and metre D. Length, Metre and a second.



The effective resistance for the arrangement of the resistors in figure 4 above is; ☐
 A. 25 ohms B. 16 ohms C. 27 ohms D. 15 ohms

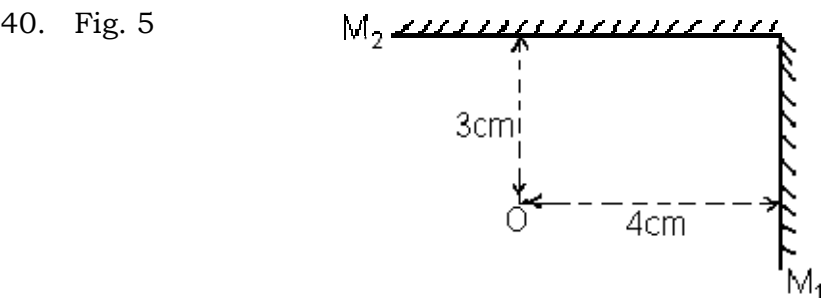


Fig. 5 Above shows that the images of an object O placed 4M and 3M from plane mirrors M_1 and M_2 . The image of O in plane mirror M_1 is I_1 and the image of O in plane mirror M_2 is I_2 . Find the shortest distance between I_1 and I_2 . ☐
 A. 10cm B. 8cm C. 6cm D. 12cm

SECTION B. (40 marks)

Answer all questions in this section.

All working must be clearly shown in the spaces provided.

41. The specific heat capacity of water is $4200 \text{ Jkg}^{-1} \text{ K}^{-1}$
- a) What is meant by the above statement? (01 mark)

- b) How much heat is required to raise the temperature of 2kg of ice at 0°C to water at 10°C? (Specific latent heat of fusion = $3.36 \times 10^5 \text{ Jkg}^{-1}$). (3marks)

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42. Tom was calculating a problem about the energy of a falling object. After he had completed the calculation, his younger sister Cissy used the paper on which he had done the work to light a charcoal stove. The piece of paper which remained is shown below.

$$\begin{array}{rcl} \frac{1}{2} MV^2 & = & Mgh \\ V^2 & = & 2 \times 10 \times 9.8 \\ V^2 & = & \\ V^2 & = & \end{array}$$

- a) From what distance did the object fall?

(01 mark)
- b) What does M stand for?(01mark)

c) What is the value of V?

(02marks)

43. a) State the Archimedes Principle. (01 mark)

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A glass block of mass 5kg is weighed in air. When the block is wholly immersed in water, it weighs 30N. Calculate;-

i) The up thrust on the block

(01 mark)

.....

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The density of the glass block in Kgm⁻¹(Density of water – 1000kgm⁻³) (02marks)

- a
- i) Define the term “Boiling point”

(01mark)

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ii) State one factor that affects the boiling point of a substance.(01mark)

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b) Give two differences between boiling and evaporation.
(02marks).....

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c) a) What is an electromagnet?

(01mark)

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d) i) Mention any two devices in which electromagnets are used.

(01mark)

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.....
ii) State two factors that affect the strength of an electromagnet. (02marks)

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46.a) Define a Joule. (01mark)

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b) A stone of mass 500g is thrown vertically upwards with a velocity of 15ms^{-1} . Calculate;
i) the potential energy at the greatest height. (2½ marks)

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the kinetic energy on reaching the ground. (2½ marks)

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47. a) State the law of electrostatics. (01mark)

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e) Draw the electric field pattern of the charges arranged as shown;- (02marks)



f) State any two uses of a gold leaf electroscope. (01mark)

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48. a) Define the following terms. (01mark)

i) A volt

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the Ohm (01mark)

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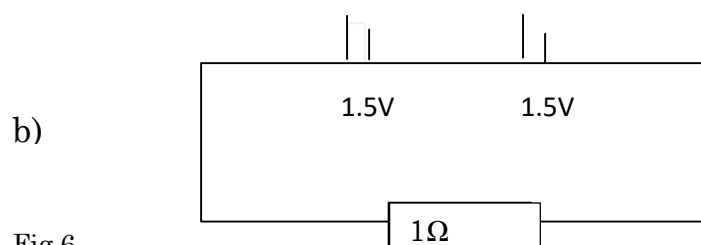
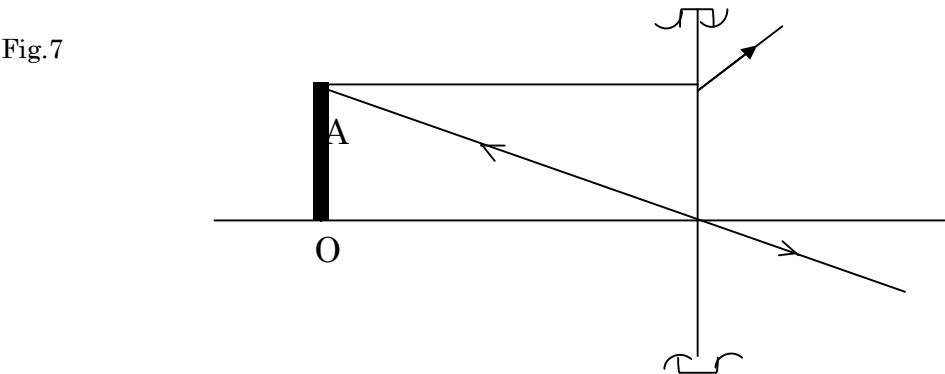


Fig.6

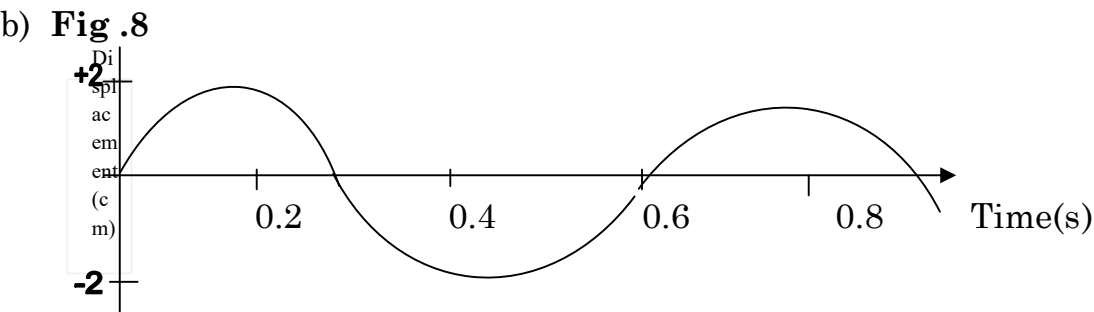
Two cells each having an e.m.f of 1.5V and an internal resistance of 2Ω are connected to a 1Ω resistor as shown in figure 6 above. Find the current in amperes. (02marks)

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49. a) In the figure below, two rays X and Y are drawn from point of the object OA. Complete the diagram to show the position of image of the object. (02marks)



- a. State two characteristics of the image (01mark)
-
-
- b. What is the power of a lens of focal length 20cm? (01mark)
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-
50. a) Define the following as applied to wave motion.
- i) Frequency (01mark)
-
-
- ii) Wave length (01mark)
-
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- Figure 8 shows a displacement time graph of a wave particle travelling. Find the;-
- Amplitude (01mark)
-
-
- i) Period (01mark)
-
- End**