Name ……. Centre/Index No……/……

***Signature* …….**

UGANDA CERTIFICATE OF EDUCATION

535/1 PHYSICS

PAPER 1

2 HOURS 15 MINUTES

Instructions to candidates

Write your name, centre/Index number and signature in the space above

Section A contains 40 objective type questions. You are required to write the correct answer A,B,C or D in the boxes at the right hand side.

Section B contains 10 structured questions. Answers are to be written in the spaces provided on the question paper.

Acceleration due to gravity = $10ms^{-2}$
Specific heat capacity of water = $4200Jkg^{-1}K^{-1}$

For Examiners' use only

Qn41	Qn42	Qn43	Qn44	Qn45	Qn46	Qn47	Qn48	Qn49	Qn50	MCQ	Total

SECTION A: (40marks)

1. A body is said to be moving with uniform acceleration when the rate of change of
   A. Distance is constant
   B. Displacement is constant
   C. Velocity is constant
   D. Velocity is not constant

2. Which of the following devices can be used to compare densities of liquids
   A. Barometer (C) Communicating tube
   B. Siphon (D) Manometer

3. An energy saving bulb is marked 240V, 15W.What is the quantity of charge that passes through the bulb in 120 seconds?
   A. 7.5 C
   B. 15 C
   C. 30 C
   D. 192 C

4. The results of rubbing an ebonite rod with fur and separating them is
   A. No charge on both the rod and fur
   B. Equal amounts of positive charge on both
   C. A positive charge on the rod and equal negative charge on fur
   D. A negative charge on the rod and an equal positive charge on fur.

5. The final velocity attained by a car moving at $10ms^{-1}$ and later accelerating at $1ms^{-2}$ in 15seconds is
   A. $150ms^{-1}$ B.$25ms^{-1}$ C.$15ms^{-1}$ D.$5ms^{-1}$

6. When Uranium 235 is bombarded with a neutron, it splits according to the equation

$$^{235}_{92}U + ^{1}_{0}n \longrightarrow ^{M}_{N}p + ^{92}_{36}Kr + 3^{1}_{0}n$$

M and N on P represent

	M	N
A.	56	141
B.	141	56
C.	199	36
D.	107	128

7. A transformer has 200 turns in the primary coil. The voltage applied to the primary coil is 240V a.c. How many turns are on the secondary coil if the output voltage is 48V a.c

A. 500 B. 4000 C. 400 D.300

8. A battery of e.m.f 6v and negligible internal resistance is connected in series to two resistors as shown in fig 1.Calculate the P.d a cross the 2Ω resistor.

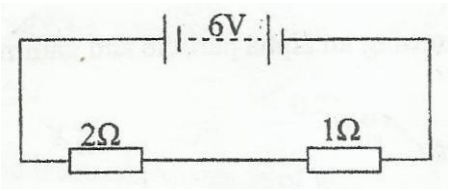


fig 1

A. 2V B.2.5V C.3V D.4V

9. To convert a galvanometer to an ammeter, the galvanometer is connected in

A. Series with shunt

B. Parallel with the shunt

C. Parallel with the multiplier

D. Series with the multiplier

10.

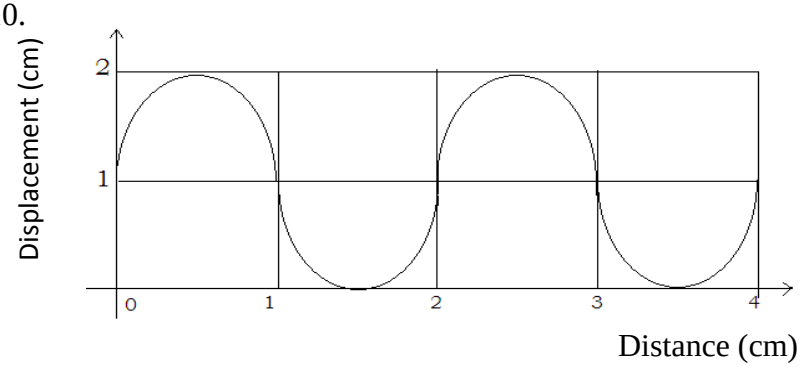


fig 2

Figure 2 shows a transverse wave. What is the wave length?

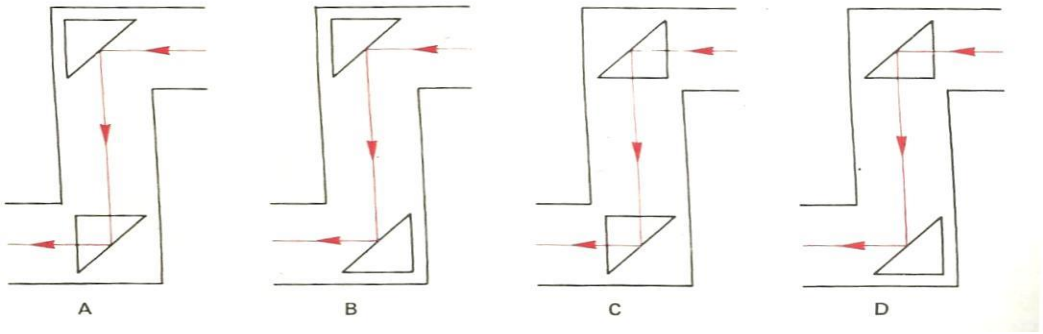
A. 4cm C. 2cm

B. 3cm D. 1cm

11. A constant force of 5N acts on a body and moves it through a distance of 20m in 10 seconds. Calculate its power in watts

A. 10 B.2.5 C. 40 D.100

12. Which one of the diagrams below best represents the paths of a ray of light through a periscope?



13. In a ferromagnetic material , a group of atomic magnets is the

A. magnadur C. ferrites

B. dipoles D. domains

14. The rate of evaporation of a liquid can be increased by increasing its;

(i) Volume

(ii) Temperature

(iii) Surface area

A. (i) only

B. (i) and (ii) only

C. (ii) and (iii) only

D. (i) and (iii) only

15. In an elastic collision

A. Bodies move with common velocity

B. Kinetic energy is not conserved

C. Kinetic energy is conserved

D. Bodies stick together

16. When you look at yourself in a mirror you see an image of yourself .The image is

A. A virtual image behind the mirror

B. An inverted virtual image

C. A real image behind the mirror

D. Caused by rays behind the mirror

17. How much heat energy is needed to warm 20g of water form 25^0 C to 35^0 C

A. 4200J B. 840J C. 420J D. 8400J

18. Which of the following gives a defect and its cause in a simple cell

Defect	Cause

A. Local action	Presence of zinc amalgam
B. Polarization	Hydrogen in gaseous form
C. Local action	Adding oxidizing agent
D. Polarization	Use of dilute electrolyte

19. The frequency of the third harmonic in an open pipe is 660Hz.Fuidn the length of the air column if the speed of sound in air is $330ms^{1}$

    A. 0.75m B.0.85m C. 1.2m D.1.0m

20. Which of the following is a vector quantity

    A. Speed B. distance C. Momentum D. Perimeter

21. An object 2cm tall is placed 5cm in front of a convex lens. A real image is produced 20cm form the lens. Calculate the magnification of the lens

    A. 4.0 B. 2.0 C. 5.0 D.0.5

22. In game supermarket a student loaded a trolley and finds it difficult to start and stop .The property of the loaded trolled which accounts for both these observation is its

    A. friction B. Energy C. weight D. Inertia

23. The law of electrostatics states that

    A. Charged occur in pairs

    B. Charges repel each other

    C. Like charges repel each other

    D. Like charges attract each other

24. A trolley of mass 4 kg moving at $3ms^{-1}$ collides with a stationary trolley of mass 2kg and remains attached to it. Calculate their common velocity

    A. $4ms^{-1}$ B. $2ms^{-1}$ C. $3ms^{-1}$ D. $5ms^{-1}$

25. In a school experiment a stream of electrons passes through a horizontal slit and strikes an inclined screen so that a trace is seen as shown in fig 3

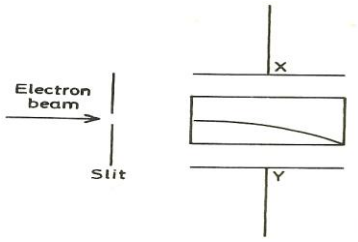


fig 3

Which of the following is the best explanation of the parabolic paths

A. Plate x has a negative potential relative to plate Y
B. Plate X has a positive potential relative to plate Y
C. The electrons are showing down and losing energy
D. The electrons are falling under the influence of gravity

26. Water waves travels a distance of 72cm in 6seconds.If the separation of successive crest is 3.0cm, find the frequency of the waves

A. 0.25Hz C.24Hz
B. 4.00Hz D. 36.00Hz

27. In a lighting system of a house, the bulbs and sockets are in parallel ,in order to

(i) Void short circuiting
(ii) Operate at the same voltage
(iii) Use the same current

A. (ii) only
B. (i) and (ii) only
C. (ii) and (iii) only
D. (i) , (ii) and (iii)

28. A d.c motor converts

A. Electrical energy to mechanical energy
B. Electrical energy to electrical energy
C. Kinetic energy to potential energy
D. Potential energy to kinetic energy

29. A uniform beam of negligible weight balanced when pivoted at p with forces of Y and 5.0N acting on it as shown in fig 4

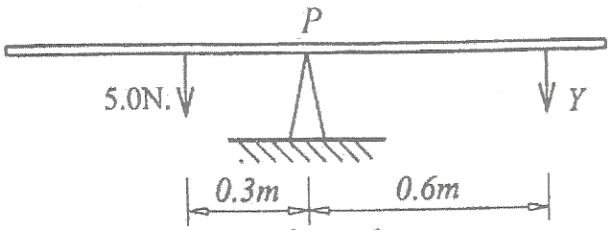


Fig 4

Find the value of Y

A. 0.4N B. 2.5N C.5.0N D.10.0N

30. An immersion heater rated 4.2Kw is placed in 5kg of water. The temperature rise per minute will be

A. 5^0C B. 0.12^0C C. 12^0C D. 12^0C

31. Which of the following is correct?

(i) Green light shone on green surface is all absorbed

(ii) Green light added equally to red lights appears yellow

(iii) Green light passes through a red filter

A. (ii) only

B. (i) and (ii) only

C. (ii) and (iii) only

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

32. Electromagnets are used in all the following appliance except

A. Telephone

B. Loud speaker

C. Electric bell

D. Thermostat

33. Concrete is obtained by mixing

A. Cement ,sisal, wood and paper

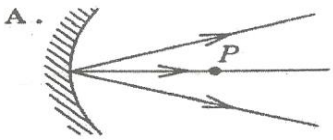
B. Cement , gravel, and water

C. Sand ,gravel ,metal rods and water

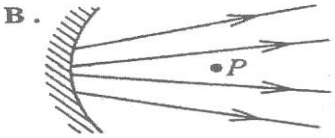
D. Gravel, sand ,sisal and water

34. A point source of light is placed at the principal focus, P of a concave mirror, which one of the following beams of light is produced after reflection from the mirror?

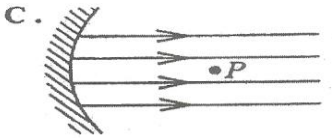
A.



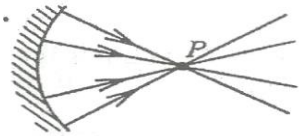
B.



C.



D.



35. When an atom loses an electron it becomes

A. A negative ion

B. A neutron

C. A positive ion

D. A proton

36. When a positively charged rod is brought near the cap of a positively charged gold leaf electroscope

A. Electrons flow from the cap towards the gold leaf

B. The divergence of the leaf does not change

C. The divergence of the leaf decreases

D. The divergence of the leaf increases

37. A girder which is under tension is referred to as

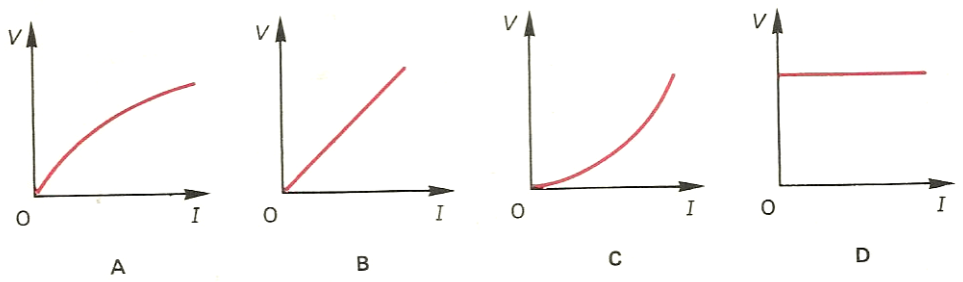
A. Tie B. beam C. strut D. Pillar

38. A person who has a mass of 50kg runs up some stairs in 9s.The stairs are 8m high. It is power output in watts is

A. $\frac{50\ x\ 8}{9}$ $C. \frac{50\ x\ 10\ x\ 8}{9}$

B. $\frac{50\ x\ 9}{8}$ $D. \frac{50\ x\ 10x\ 9}{8}$

39. The graphs show the potential difference a cross a component plotted against the current in the component .Which of the graphs would be obtained for a coil of copper wire?



40. A mass of 0.4kg of oil in a container is warmed form 20^0C to 24^0c by 2260J of energy. The specific heat capacity of the oil in $Jkg^{-1}k^{-1}$

A. 0.4 x 44 x 3360

B. $\frac{0.4\ x\ 4}{3360}$

C. $\frac{0.4\ x\ 3360}{4}$

D. $\frac{33600}{0.4\ x\ 4}$

SECTION B

41. (a) Define the term internal resistance as used in electricity (01mark)

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(b)

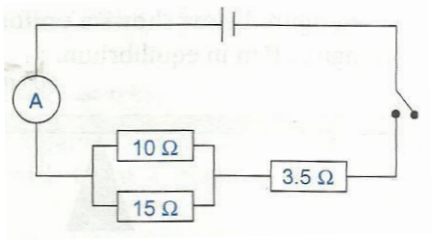

fig 5

In the circuit shown in fig 5, the e.m.f of the battery is 2.1V and has an internal resistance of 0.5Ω. Determine the ammeter reading when the switch is closed. (01mark)

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42. (a) State the principle of moment. (01mark)

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(b)

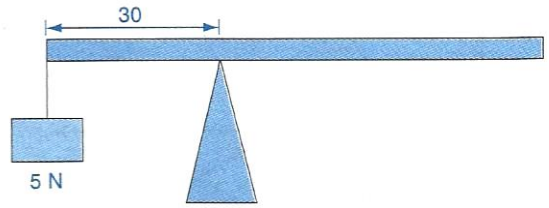

Fig.6

The uniform bar in fig 6 is not in equilibrium, when a 2N weight is hung at the center, the bar balances. Given the length of the bar to be 1.0m, determine the weight of the bar.

(03marks)

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43. (a) Define the term radioactivity as used in modern physics. (01marks)

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(b)

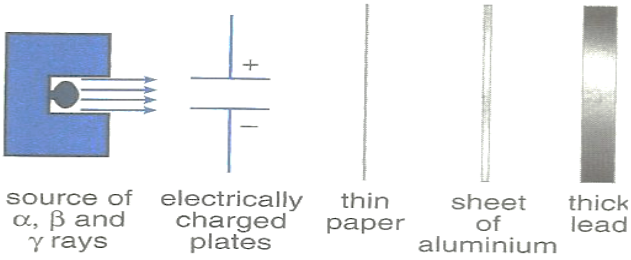

fig 7

Figure 7 shows the source of $\alpha - paricle, \beta - particle$ and ɣ- rays. Copy and complete the figure to show how the particles and rays are deflected and at which material each of them is stopped.

44. (a) Briefly explain what is meant by the term Eddy current as used in a transformer. (02marks)

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(b) A transformer with 400 turns in the secondary circuit and 20turns in the primary circuit lens a p.d of 2400v in the primary circuit. What is the p.d in the secondary circuit?

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45. (a) What is meant by the following terms

(i) Wavelength of a longitudinal wave. (01mark)

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(ii) Frequency of a wave (01mark)

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(b) Sketch a displacement time graph of a wave of amplitude 0.5cm and frequency 4Hz overtime interval of 1.25 seconds (02marks)

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46. (a) What is meant by the term critical angle as used in light? (01mark)

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(b)A pin is placed close to one face of rectangular block of glass and is viewed normally through the opposite face. If the block is 27cm long, how far will the pin appear to be from the front face of the block, given that the material of the block has refractive index of 1.5. (03marks)

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47. (a) A fixed mass of a gas was put in a container whose one end was closed, the temperature and volume of the gas was changed at constant pressure .State the laws that relates the volume and the temperature of the gas. (01mark)

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(b) How much heat is required to raise the temperature of 500g of copper form 15^0C to 115^0C (specific heat capacity of copper $=0.39Jg^{-1}k^{-1}$) (03marks)

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48. (a) State the laws of magnetism (01mark)

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(b) During an experiment a student in S.4 was provided with two bar magnets, X and Y .One is magnetized and the other is not. Explain how you would identify the magnetized bar magnet. (03marks)

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49.

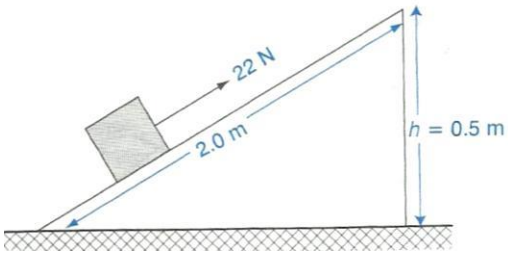

fig 8

Figure 8 shows a load of 50N being raised by pulling it along an inclined plane of length 2.0m .Determine

(i) The work done on the load. (02marks)

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(ii) The efficiency of the system. (02marks)

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50. (a) Why is an ammeter constructed such that it has a low internal resistance? (01mark)

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(b) A millimeter has internal resistance of 4Ω and a full scale deflection of 15mA.calculate the value of the resistor that must be connected to the millimeter so that it gives maximum current. (03marks)

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