Names:……..……..**Signature .....**

School Exam Number:.....**Index No**:.....

*Candidates should **NOT** write their Centre Name or Centre Number anywhere on this booklet*

535/1
PHYSICS
Paper 1
July 2022
2 ¼ hours

SET ITEM ONE

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*** *in the Answer grid provided on **Page Eight**.*

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

Answers to Section **B** *must be filled in the spaces provided on the question paper.*

Mathematical tables, slide rules and silent non – programmable calculators may be used.

Acceleration due to gravity = $10m/s^2$

Specific heat capacity of water = $4200\ Jkg^{-1}\ k^{-1}$

Speed of light = $3 \times 10^8 ms^{-1}$

		FOR OFFICIAL USE ONLY										
QN	**SEC** A	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**TOTAL**
MCQ												

SECTION A (40 MARKS)

1. In an X-ray cooling tube, the voltage across the anode and cathode is to

A. heat up the anode
B. cause thermionic emission
C. provide current that heats the cathode
D. accelerate electrons from cathode to anode

2. A boat on a river flowing eastwards at 12 ms^{-1} is acted on by wind blowing northwards at a velocity of 5 ms^{-1}. Find the resultant velocity of the boat in ms^{-1}.

A. 7.0
B. 13.0
C. 17.0
D. 169.0

3. $^{120}_{80}X$ is the symbol for a nuclide whose number of neutrons is

A. 40
B. 80
C. 120
D. 200

4. Saturated vapour pressure is the pressure exerted by

A. liquid which is in dynamic equilibrium with its vapour
B. vapour which is in dynamic equilibrium with its liquid
C. solid which is in dynamic equilibrium with its vapour
D. liquid which is in dynamic equilibrium with its solid

5. Two balls of equal masses are projected forward with their velocities of 10 ms^{-1} and 4 ms^{-1}. Calculate their common velocity.

A. 3
B. 7
C. 6
D. 14

6. A bimetallic strip operates on the principle that metals

A. expand at different rates
B. expand at the same rate
C. are heat controllers
D. are good conductors of heat

7. Sound waves are carried from point A to point B

A. by molecules at point A moving to point B
B. by molecules between points A and B vibrating parallel to direction AB
C. by molecules between A and B vibrating perpendicular to AB
D. Independently of the movement of molecules

8. A system of pulleys is used to raise a load of 900 N through 2m by an effort of 200N. If the efficiency of the system is 75%, what is the distance moved by the effort?

A. 0.3 m
B. 6.0 m
C. 12.0 m
D. 6.8 m

9. The loudness of sound depends on

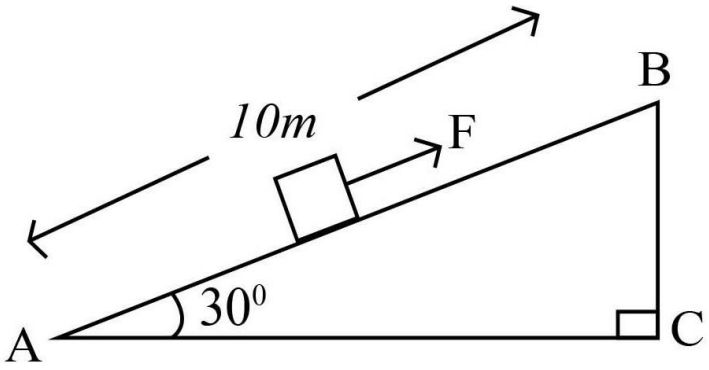
A. Velocity
B. Frequency
C. Wavelength
D. Amplitude

10. Concave mirrors are used as

(i) Driving mirrors
(ii) Torch reflectors
(iii) Magnifying mirrors

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

11.



A load of 40 *N* is pulled steadily from A to B along an inclined plane by a force *F*; the velocity ratio of the system is

A. 1.0
B. 1.2
C. 2.0
D. 4.0

12. The activity of a radioactive element with half-life of 30 days is 2400 counts per minute. Find the activity of the element after 120 days in counts per second.

A. 75
B. 150
C. 300
D. 600

13. An annular eclipse occurs when

A. the sun is totally covered by the moon
B. a bright ring of sunlight shows round the edge of the moon
C. the earth is between the sun and the moon
D. the sun is between the earth and the moon

14. How long does it take an alternating p.d. of peak value 10V and frequency of 50Hz to make one cycle?

A. 0.02 *s*
B. 0.20 *s*
C. 5.00 *s*
D. 500.00 *s*

15. Which of the following materials can be electrified by friction?

A. Silver rod
B. Copper rod
C. Plastic ruler
D. Wet wood

16. A p.d. of 20 *V* is applied across two resistors of 4 Ω amd 6 Ω connected in series. What is the p.d. across the 6 Ω resistor given that the total circuit current is 2 *A*?

A. 1.0 *V*
B. 2.0 *V*
C. 3.3 *V*
D. 12.0 *V*

17. When a steadily increasing force is applied to a moving object, all the following change except

A. Mass
B. Speed
C. Momentum
D. Acceleration

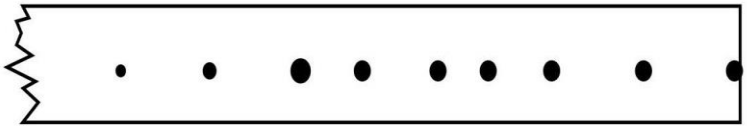
18. The phenomenon upon which optical fibre works is

A. refraction of light
B. total internal reflection
C. diffraction of light
D. reflection of light

19. A transformer having primary coil of 400 turns and secondary coil of 200 turns is connected to a 240 V a.c. mains supply. Find the secondary voltage.

A. 480 V
B. 333 V
C. 120 V
D. 33.3 V

20. The figure below shows dots made in a ticker tape by a ticker timer which vibrates at a frequency of 40 Hz.



Find the time taken to make the dots.

A. 5.00 *s*
B. 4.44 *s*
C. 0.23 *s*
D. 0.20 *s*

21. The basic difference between the transverse and longitudinal waves is in

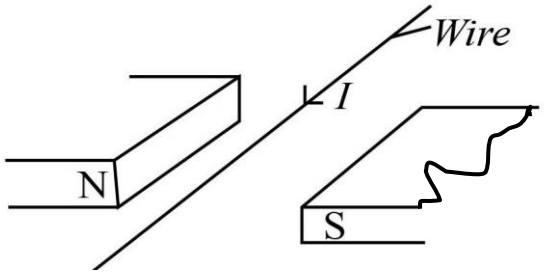
A. amplitude
B. wave length
C. direction of vibration
D. wave travel medium

22. A magnet can be made to lose its strength by

(i) Heating
(ii) Throwing it violently
(iii) Placing it in a solenoid carrying direct current

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

23.



When current I, flows through a wire placed between the poles of a U – magnet as shown in the figure above, the wire will move

A. upwards
B. downwards
C. towards South Pole
D. towards North Pole

24. Two appliances are rated 240 V, 2 kW and 240 V, 500 W. If the cost of running these appliances for 3 hours is Shs 1050, find the cost of one unit of electricity.

A. Shs 70
B. Shs 140
C. Shs 35
D. Shs 20

25. Which of the following bands has less energy than that of a visible spectrum?

A. Gamma
B. X-rays
C. Ultraviolet
D. Infrared

26. A ray of light traveling from the air to water is refracted at an angle of 30^0. Find the angle of incidence if the critical angle of water is 48.6^0.

A. 22.1^0
B. 40.6^0
C. 41.7^0
D. 60.0^0

27. Two equal forces of 200 N act on a wheel to cause moment of a couple of 600 Nm. What is the radius of the wheel?

A. 30 cm
B. 15 cm
C. 20 cm
D. 40 cm

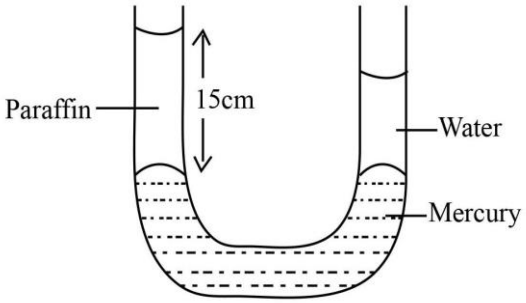
28. In hydraulic machines,

A. an object displaces its own weight of the fluid
B. the pressure transmitted in a fluid is the same in all directions
C. the volume of fluid compressed is proportional to the applied force
D. an object experiences an up thrust equal to the weight of the fluid displaced

29. In a simple cell, the conventional flow of current is

A. from the positive to negative terminal of the cell
B. from the negative to the positive terminal of the cell
C. due to polarization
D. due to local action

30. The figure shows a U-tube containing mercury, a column of water of density 1000 kgm^{-3} and a column of paraffin of density 800 kgm^{-3}. Find the length of the water column if the length of the paraffin column is 15 cm.



A. 12.00 cm
B. 18.75 cm
C. 1.25 cm
D. 0.80 cm

31. The lower part of the second floor of a storied building is made of reinforced concrete while the upper part is not, because

(i) the lower part is subjected to tensional forces while the upper part is subjected to compression forces
(ii) non-reinforced concrete can withstand large tensional forces
(iii) reinforced concrete can withstand large tensional forces

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

32. A person stands 5*m* away from a plane mirror. Find the distance that the person must move in order to be 4*m* away from the image in the mirror.

A. 3 m
B. 1 m
C. 4 m
D. 7 m

33. The volume of a fixed mass of gas at a temperature of 57^0 C is 750 cm^3. Find the volume of the gas when its temperature is 9^0C at constant pressure.

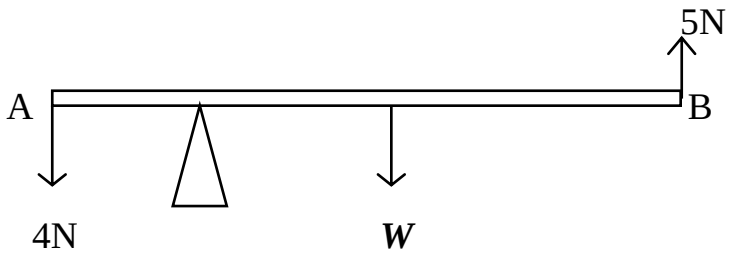
A. 118.4 cm^3
B. 124.1 cm^3
C. 640.9 cm^3
D. 877.7 cm^3

34. Which of the following increases the stability of a body?

(i) Raising the centre of gravity
(ii) Lowering the centre of gravity
(iii) Making its base narrow
(iv) Making its base wide

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

35. A uniform wooden beam of weight ***W*** is pivoted at a distance of 1/5 of its length. Forces of 4N and 5N applied to it as shown below.



Turn Over

What is the force exerted by the pivot on the beam?

A. 8 N
B. 10 N
C. 16 N
D. 25 N

36. The length of a mercury column of a thermometer at ice point and steam point are 2.0 cm and 22.0 cm respectively. The reading of the thermometer when the mercury is 9.0 cm long is

A. 31.8^0 C
B. 35.0^0 C
C. 40.9^0 C
D. 45.0^0 C

37. The hydraulic brake operates on one of these principles. Identify it.

A. Bernoulli's principle
B. Archimedes' principle
C. Pressure in fluids
D. Pascal's principle of transmission of pressure in fluids

38. Surface tension in liquids is due to

A. Cohesion forces
B. Adhesion forces
C. Capillarity
D. Brownian motion

39. A mass of 800g of molten metal at 1200^0 *C* gives out $4 \times 10^5 J$ of heat on solidification. Find the specific latent heat of fusion of the metal in JKg^{-1}.

A. 3.3×10^2
B. 5.0×10^5
C. 2.7×10^5
D. 6.0×10^5

40. The brightness of the TV screen is determined by

A. Darkness of the screen
B. Number of electrons reaching the screen
C. Size of the screen
D. Direction of the aerial

	ANSWER GRID FOR SECTION A								
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

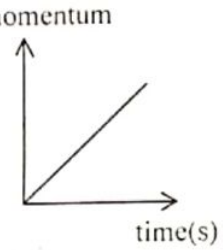
SECTION A (40 Marks)

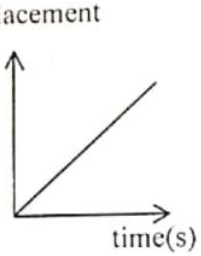
Answer **all** questions in this section

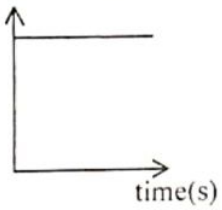
1. Which one of the following substances undergoes plastic deformation?
   A. Copper
   B. Wood
   C. Glass
   D. Concrete

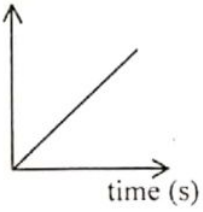
2. A body of mass 120 g and density 2.5 gcm^{-3} is placed in a measuring cylinder containing water and the level of water rises to 80 cm^3. Find the initial level of the water.
   A. 48 cm^3
   B. 40 cm^3
   C. 32 cm^3
   D. 30 cm^3

3. A body of a given mass is moving with uniform momentum. Which of the following graphs describes its motion?

   A.
   

   B.
   

   C.
   

   D.
   

4. Which of the following statements are true about light colour filters.
   (i) Magenta filter absorbs red and transmits blue and green.
   (ii) Magenta filter absorbs green and transmits red and blue.
   (iii) Cyan filter absorbs blue and transmits red and green.
   (iv) Yellow filter absorbs blue and transmits red and green.

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

5. The process of using a material of low thermal conductivity to prevent heat loss is called
   A. lagging.
   B. cooling.
   C. absorption.
   D. contraction.

6. In an experiment to find how the force of repulsion between two magnets varies with their distance apart, the following results in a table below were obtained.

Force (N)	Distance (m)
30	1
120	4
480	16

From the results it can be deduced that:

A. $F \alpha d^2$

B. $F \alpha d$

C. $F \alpha \frac{1}{d}$

D. $F \alpha \frac{1}{d^2}$

7. A ray of light AO is incident on a plane mirror and it is reflected along OB as shown in figure 1 below.

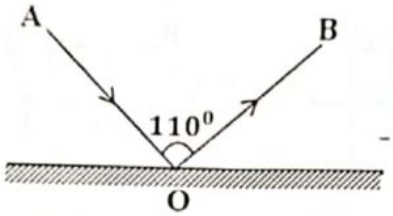


Fig. 1

The glancing angle is:

A. 35^o

B. 40^o

C. 55^o

D. 60^o

8. In order to charge a gold leaf electroscope positively by induction, the following is the correct order of the process involved:

(i) A negative rod is brought close to the cap.

(ii) The cap is earthed.

(iii) The negative rod is withdrawn.

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

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

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

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

9. Two girls are swinging in turns. One of them complained how it was hard to set her friend in motion. The property that accounts for this tendency is

A. friction.

B. inertia.

C. gravitational force.

D. momentum.

10. Two boys P and Q of masses 40 kg and 60 kg respectively climb a distance of 8 m each in 10 seconds and 15 seconds respectively. One of the following statements is correct about them.

A. The power of P equals to the power of Q.

B. The power of P is greater than that of Q.

C. The power of Q is greater than that of P.

D. The work done by P is greater than done by Q.

11. **Fig. 2**

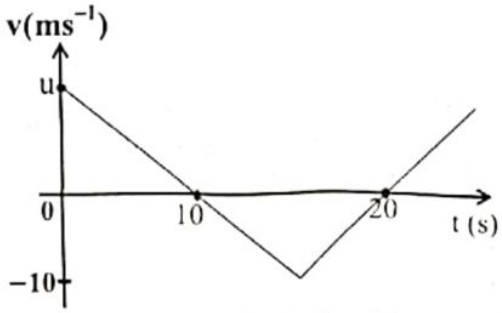
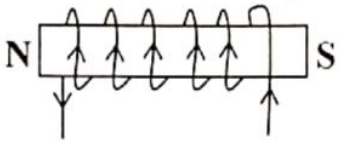
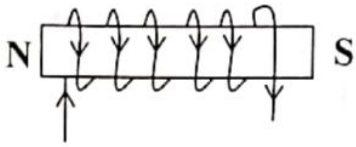


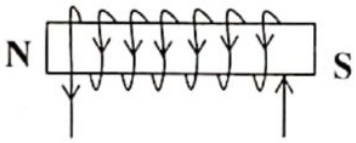
Figure 2 above shows motion of a body which covered a total displacement of 50 m. Find the value of its initial velocity u.

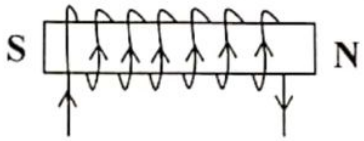
A. $4.5\ ms^{-1}$
B. $10\ ms^{-1}$
C. $16\ ms^{-1}$
D. $20\ ms^{-1}$

12. The diagrams below show electric field and polarity of an electromagnet. Which of them is correct?

A.


B.


C.


D.


13. Plane waves are diffracted as circular waves in a narrow gap. When the gap is made narrower the plane waves become

A. straight waves.
B. more circular.
C. standing waves.
D. reflected.

14. **Fig. 3**

Four identical cylindrical resistors each of cross sectional area A, resistivity **ρ**, and length ***l*** are combined in a bundle as shown in figure 3 above. Their effective resistance **R** is given by:

A. $\frac{\rho l}{4A}$
B. $\frac{4\rho l}{A}$
C. $\frac{4A}{\rho l}$
D. $4A\rho l$

15. Which of the following are true about a wave travelling from deep to shallow water?

(i) wavelength reduces.
(ii) velocity reduces.
(iii) wave length increases.
(iv) velocity increases.

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

16. A magnified virtual image can only be produced by a
A. plane mirror.
B. convex mirror.
C. concave mirror.
D. driving mirror.

17. The density of a substance can be termed as the
A. quantity of matter per unit square metre.
B. space occupied by a substance.
C. quantity of matter per unit space occupied by a substance.
D. gravitational force working on a substance.

18. Full wave rectification can be achieved by using either of the following
(i) one diode
(ii) two diodes
(iii) three diodes
(iv) four diodes
A. (i) only
B. (ii) and (iv) only
C. (iii) and (iv) only
D. (iv) only

19. A fixed mass of an ideal gas has temperature, **T**, volume, v, and pressure **P**. When its pressure is halved and volume is trippled, its new temperature becomes.
A. $\frac{3}{2}T$
B. $\frac{2}{3}T$
C. $\frac{1}{6}T$
D. $6T$

20. Four bar magnets A, B, C and D were placed next to one another as shown in fig. 4 below.

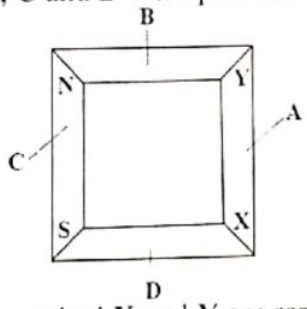


Fig. 4

The poles of magnet **A** marked **X** and **Y** are respectively
A. south and north.
B. south and south.
C. north and north.
D. north and south.

21. A nuclide $^{10}_{6}\mathbf{X}$ decays to nuclide **Y** by emission of a Beta particle and Alpha particle. The nucleon number of **Y** is:
A. 16
B. 11
C. 6
D. 1

22. A high AC voltage can be obtained from a low DC voltage by use of a
A. rectifier.
B. inverter and transformer.
C. transformer.
D. diode and a transformer.

23. A uniform beam of mass 250 g is pivoted at point P as shown fig 5 below.

Fig. 5

Determine the mass B to be put at one end for the beam to balance.
A. 120 g
B. 122 g
C. 125 g
D. 250 g

24. Which of the following statements is/are correct about a body moving with uniform velocity.
(i) Resultant force is zero.
(ii) Acceleration is zero.
(iii) Momentum is zero.
A. (i) and (ii)
B. (i) and (iii)
C. (iii) only
D. (i) (ii) and (iii)

25. In gears a large velocity ratio is obtained when,
A. effort is applied on a small gear to drive a large gear.
B. effort is equal to the load.
C. effort is applied on a large gear to drive a small gear.
D. the gears move in opposite directions.

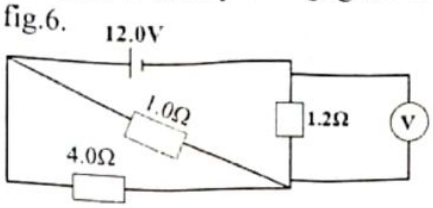
26. A fish in a pond looks at a man standing besides the pond. To the fish, the man appears to be
A. smaller and nearer than he actually is.
B. smaller and further than he actually is.
C. larger and nearer than he actually is.
D. larger and further than he actually is.

27. When Action and Reaction forces act on a body, the resultant is
A. greater than zero.
B. one.
C. less than zero.
D. zero.

28. A liquid of density $1.0 \times 10^3 kgm^{-3}$ fills a vessel of uniform cross-sectional area of 200 cm^2 to a depth of 500 mm. Calculate the force exerted by the liquid at the bottom of the vessel.
A. 50 N
B. 100 N
C. 150 N
D. 200 N

29. Three resistors are connected to a 12.0 V battery of negligible internal resistance as shown in the circuit below in fig.6.

Fig. 6



Find the voltmeter reading.

A. 6.0 V
B. 7.2 V
C. 8.0 V
D. 12.0 V

30. Clouds are 1650 m from the observer on the ground. Find the time that elapses between the lightening flash and thunder. (Speed of sound in air = 330 ms^{-1})

A. 0.005 s
B. 050 s
C. 5.0 s
D. 50 s

31. The advantage(s) of mercury over alcohol as a thermometric liquid is/are

(i) mercury is opaque.
(ii) mercury has a high temperature coefficient of expansion.
(iii) mercury is more sensitive.
(iv) mercury is a good conductor of heat.

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

32. One of the following statements is true about the working of simple cells.

A. Polarisation is caused by impure zinc.
B. The hydrogen produced at the zinc plate causes polarisation.
C. The formation of hydrogen bubbles at the copper plate causes local action.
D. Potassium dichromate is used to minimise polarization.

33. It is easier to charge insulators than conductors because

A. insulators do not allow the charge to flow away but conductors do.
B. conductors allow the charges to flow through them but insulators don't.
C. it is impossible to charge conductors under any condition.
D. insulators just receive charge from the atmosphere without being rubbed.

34. State what would happen to the size of a football inner tube when its pressure is increased, if it exactly obeys Boyle's law.

A. It would increase.
B. It would reduce.
C. It would not change.
D. It would lead to immediate bursting.

35. 93.75% of a radioactive material decays after 80 days. Find its half-life.

A. 20 days
B. 40 days
C. 80 days
D. 120 days

36.

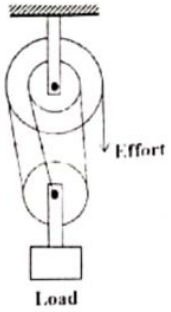


Fig. 7

The diagram in figure 7 above shows a pulley system. Which of the following statement(s) is true about it?

(i) The mechanical advantage of the system increases up to a limit as the load increases.

(ii) The mechanical advantage cannot exceed 3 depending on the load.

(iii) The efficiency of the system increases as the load increases.

A. (i) and (ii) only

B. (ii) and (iii) only

C. (i) and (iii) only

D. (iii) only

37.

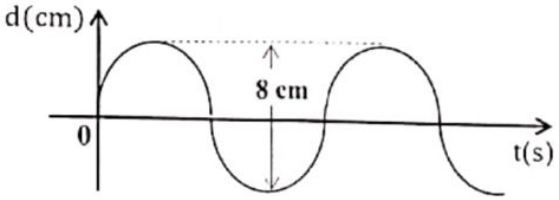


Fig. 8

Figure 8 above shows a wave in motion. If its wavelength is half the amplitude with a frequency 50 Hz, calculate its velocity.

A. 0.5 ms^{-1}

B. 1.0 ms^{-1}

C. 2.0 ms^{-1}

D. 4.0 ms^{-1}

38. A charge of 30 C flows through a coil for one sixth of a minute. If the resistance of the coil is 4.0 Ω find the pd across it.

A. 10.0 V

B. 12.0 V

C. 14.0 V

D. 16.0 V

39. In Optics, which of the following is true in both concave mirrors and convex lenses during image formation?

A. An incident ray parallel and close to the principal axis passes through the principal focus after reflection or refraction.

B. An incident ray through the principal focus is reflected/refracted through the centre of carvature.

C. A ray through the principal focus is reflected/refracted along the same path.

D. A ray through the optical centre is undeviated during reflection from the lens.

SECTION A

1. The following are fundamental quantities except
   A. Mass C. Volume
   B. Time D. Length

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   A. Rule C. Micrometer screw gauge
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	Hard x-rays	Soft x-rays
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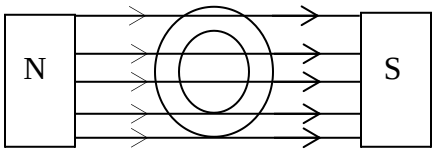

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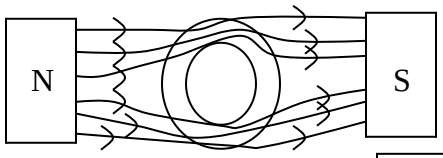

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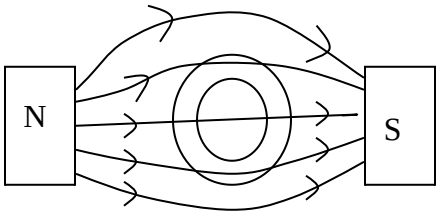

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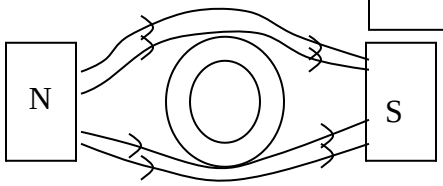

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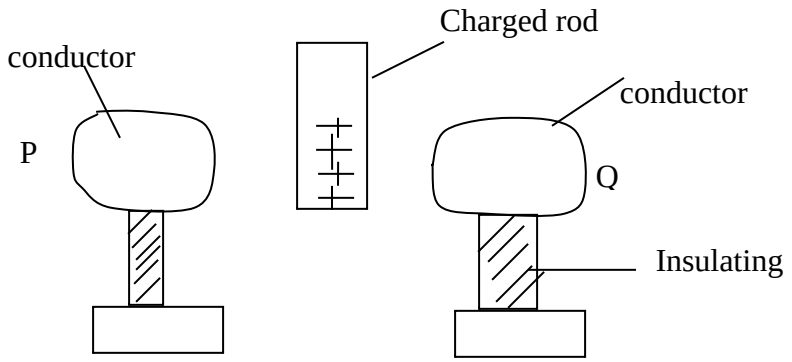

	P	Q
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C	Positive	Positive
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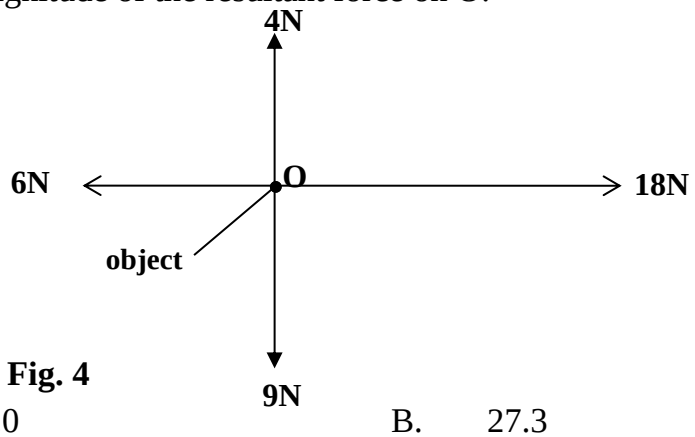

Fig. 4

A. 37.0 B. 27.3
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    (i) Real
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    (iii) Diminished

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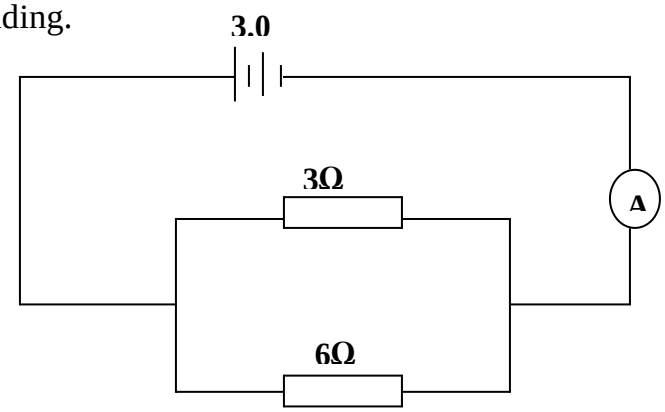

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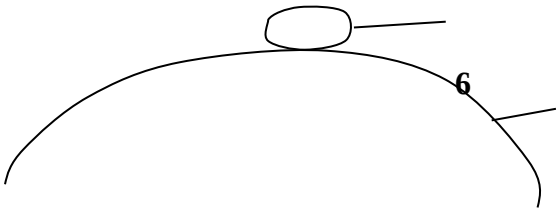

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Figure 6 shows a ball resting on an inverted hemispherical bowl.
State the kind of equilibrium demonstrated.

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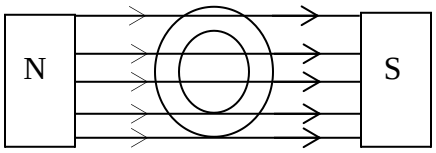

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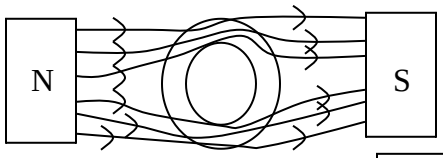

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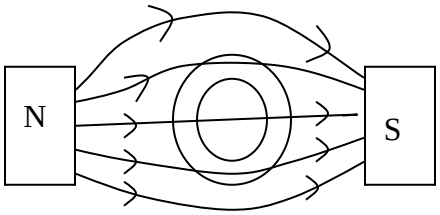

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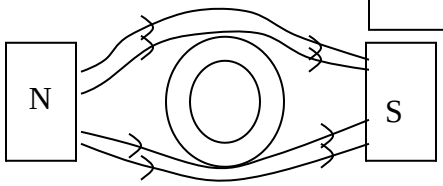

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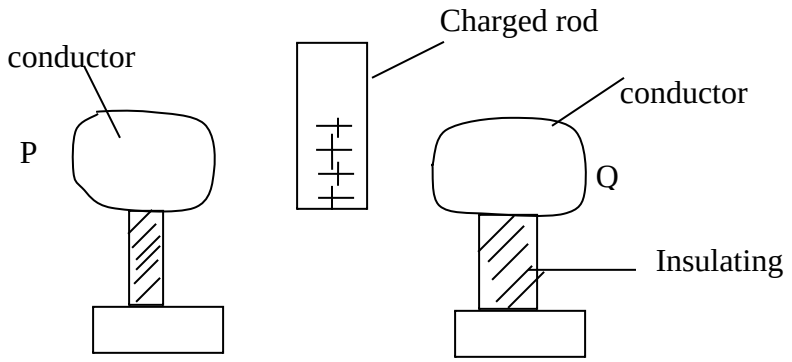

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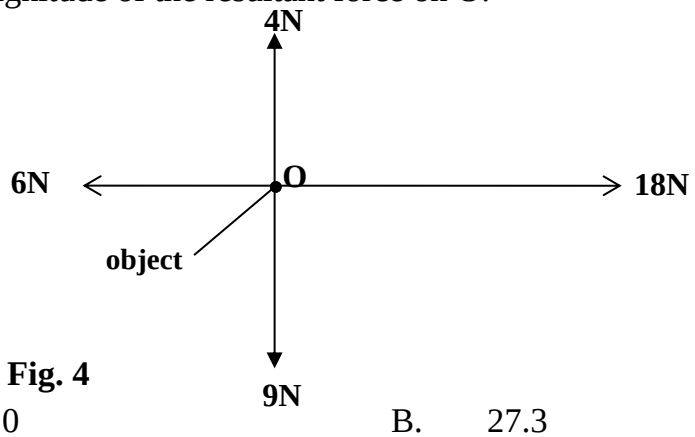

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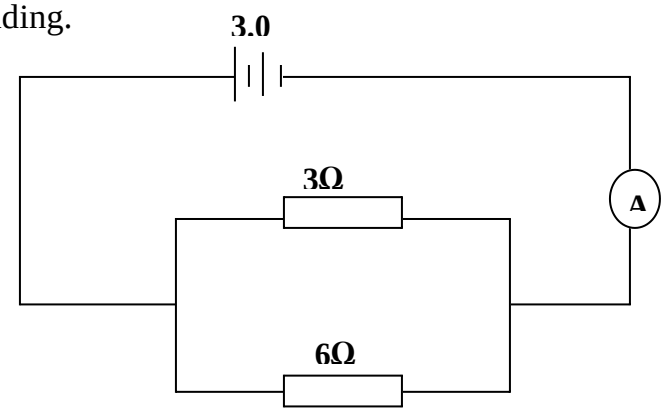

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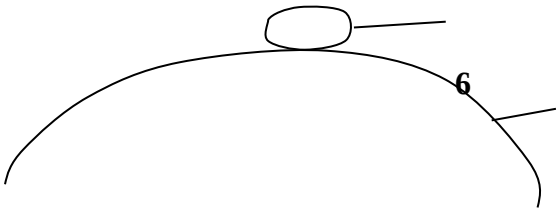

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Name……INDEX NUMBER …….
Signature:……

535/1
PHYSICS
Paper 1
2 hours 15 minutes

ST BRIDGET GIRLS HIGH SCHOOL

BEGINNING OF TERM 2 EXAMINATION 2018

S.4 PHYSICS PAPER 1

INSTRUCTIONS TO CANDIDATES: 2 HOURS 15 MINUTES

Write your name, signature, centre and index number clearly in the spaces above.

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 of each question.

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

Mathematics tables slide rules and silent non-programmable calculators may be used.

Acceleration due to gravity	=	$10ms^{-2}$
Specific heat capacity of water	=	$4200\ Jkg^{-1}\ K^{-1}$
Specific heat capacity of copper	=	$400\ J\ kg^{-1}\ K^{-1}$

For Examiner's Use Only

MCQ	41	42	43	44	45	46	47	48	49	50	TOTAL

SECTION A

1. Pressure in solids depends on:
   A. Density of the material B. Mass of the solid
   C. Volume occupied D. Area of contact

2. In a cathode ray tube, the grid is the;
   A. electron producer B. electron accelerator
   C. brightness controller D. beam deflector

3. A car starts from rest and accelerated uniformly at the rate of $2ms^{-2}$ for ¼ of a minute. Find the velocity of the car after this time.
   A. $30ms^{-1}$ B. $15ms^{-1}$ C. $12ms^{-1}$ D. $0.5ms^{-1}$

4. 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. Virtual, erect, magnified
   B. Real, erect, diminished
   C. Real, inverted, diminished
   D. Real, inverted, magnified

5. The mass of a radioactive substance reduces to ¼ of its original mass after 10 days. What is its half life?
   A. 2.5 days B. 5 days C. 20 days D. 40 days

6. Soft iron is used in telephone ear piece because it
   A. loses magnetism easily
   B. gains magnetism easily
   C. gains and loses magnetism easily
   D. takes long to gain magnetism

7. A solid measures 5cm by 4cm by 10cm. If the mass of the solid is 0.8kg, find its density in Kgm^{-3}.
   A. $\frac{0.8\times10^{-6}}{5\times4\times10}$ B. $\frac{0.8}{5\times4\times10^{-6}\times10}$ C. $\frac{5\times4\times10\times10^{-6}}{0.8}$ D. $\frac{5\times4\times10}{0.8\times10^{-6}}$

8. A car radiator is painted black and filled with water because
   (i) black bodies are good absorbers of heat
   (ii) water facilitates heat transfer by convection
   (iii) water is a poor conductor of heat

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

9. When a negatively charged rod is brought near the cap of a negatively charged electroscope, the leaf;
   A. decreases in divergence B. increases in divergence
   C. remain uncharged D. gain positive charges

10. A mass of 0.5kg causes a spiral spring to extend by 4cm. Find the force that would cause an extension of 6cm.
A. 2.0N B. 3.3N C. 4.8N D. 7.5N

11. Which of the following is a non-renewable source of energy?
A. Solar B. Wind C. Fossils D. Biogas

12. A current of 2A flows through a bulb for 10s. If the p.d across the bulb is 6v, find the work done.
A. 120J B. 30J C. 3.3J D. 1.2J

13. Constructive interference of waves occurs when the two waves are;
(i) in phase
(ii) moving in opposite directions
(iii) have the same wave length and frequency

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

14. The cost of using an electric appliance for 2 hours is shs.1600. If each unit of electricity costs shs.50, find the power rating of the appliance in KW.
A. $\frac{1600}{50\times 2}$ B. $\frac{1600\times 2}{50}$ C. $\frac{50\times 2}{1600}$ D. $\frac{50}{2\times 1600}$

15. The mechanical advantage of a simple machine may be increased by:
(i) increasing the load
(ii) increasing the weight of the movable parts of the machine
(iii) reducing friction between moving parts

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

16. The temperature of 4kg of paraffin drops from 25^{o}C to 20^{o}C when it loses 44,000J of heat. Find the specific heat capacity of paraffin.
A. 5.50×10^{2}J Kg^{-1}k^{-1} B. 4.40×10^{2}J Kg^{-1}k^{-1}
C. 2.44×10^{2}J Kg^{-1}k^{-1} D. 2.20×10^{3} J Kg^{-1}k^{-1}

17. Heat energy produced by the sun is a result of
A. Alpha emissions B. Beta emissions
C. Nuclear fission D. Nuclear fusion

18. The temperature at which all the heat energy is removed from a substance is called;
A. Kelvin temperature B. Celsius temperature
C. Absolute zero temperature D. Freezing temperature

19.

When the switch K is closed, the total resistance in the circuit above is;

A. 0.8Ω B. 1.25Ω C. 5.0Ω D. 8.0Ω

20. Images formed by diverging mirrors are;

A. laterally inverted B. magnified C. virtual D. real

21. Which of the following is an application of microwaves?

A. Cooking B. Production of photography

C. Finding flaws in metals D. Sterilising equipment

22. A car travelling at a speed of 72Kmh^{-1} overcomes a resistance of 30N. Find the power developed by the engine of the car in watts.

A. $\frac{72\times30\times1000}{3600}$ B. $\frac{30\times3600\times72}{1000}$

C. $\frac{30\times3600\times1000}{72}$ D. 72 x 3600 x 1000

23. Which of the following is true about a step-up-transformer? It

(i) has more turns of wire in the secondary coil than in the primary

(ii) changes alternating voltage from higher to lower values

(iii) changes alternating voltage from lower to higher values

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

24. The equation below shows charges that occur when nuclide X decays to form Y

$^{238}_{92}X \longrightarrow {}^{230}_{88}Y$

Which one of the following radiations are emitted?

A. One alpha and two beta particles

B. One beta and two alpha particles

C. Two alpha particles and two beta particles

D. Two alpha particles

25. An observer produces sound and hears an echo after 6s. Find the distance between the observer and the reflecting surface. (Speed of sound = 300 ms^{-1})

A. $\left(\frac{300}{6\times2}\right)m$ B. $\left(\frac{300}{6}\right)m$ C. $\left(\frac{300\times6}{2}\right)m$ D. (300 x 6) m

26. The hairs of a wet brush cling together because of:

A. adhesion B. diffusion C. capillarity D. surface tension

27. Which one of the following is not a primary source of energy?

A. Dry cell B. The sun C. water D. Wind

28. A current of 5A flows through a given point in a circuit for 2 minutes. Calculate the quantity of charge that passes the point.

A. 2.5c B. 10.0c C. 300.0c D. 600.0c

29. In order to confirm whether a piece of metal is a magnet or not, that metal is;
A. bent when heated
B. attracted by a known magnet
C. repels a known magnet
D. deflects a magnetic compus

30. The refractive index of a glass is 1.5. Calculate the angle of refraction for light incident on glass at an angle of 30^o.
A. 19.5^o B. 42.0^o C. 45.0^o D. 48.6^o

31. In an electric appliance, a fuse is connected to t he live wire in order to;
A. increase the current entering the appliance
B. protect he appliance incase of too much current entering it.
C. protect the person using the appliance from getting an electric shock.
D. quicken the conversion of electrical energy by an appliance

32. Permanent magnets are made from;
A. diamagnetic materials B. paramagnetic materials
C. dielectric materials D. ferromagnetic materials

33. The phenomenon by which electrons are released from a metal surface when radiation falls on it is known as
A. radioactivity B. thermionic emission
C. photo electric effect D. reflection

34. Water waves are produced at a frequency of 5Hz and the distance between 19 successive crests is 35cm. Calculate the velocity of the waves.
A. $9.0ms^{-1}$ B. $1.0ms^{-1}$ C. $0.1ms^{-1}$ D. $0.09ms^{-1}$

35. Local action in a simple cell is caused by the presence of;
A. Zinc amalgam coating on zinc plate
B. Manganese (IV) oxide around copper plate
C. Hydrogen bubbles on the copper plate
D. Impurities in zinc

36. The following are some of the uses of X-rays except;
A. Treatment of cancer
B. Preservation of food
C. Detection of flows in welded joints
D. Archeological dating

37. When a tightly corked bottled full of water is left overnight in the ice chamber of a refrigerator it will burst because;
A. its out side contracts faster than the inside
B. water will contract and create vacuum in the bottle
C. the ice in the chamber squeezes the bottle
D. water expands on freezing

38. A possible isotope of ${}^{7}_{3}Li$ has

A. 2 protons and 3 neutrons B. 2 protons and 4 neutrons
C. 3 protons and 4 neutrons D. 4 protons and 2 neutrons

39

A force of 16N is used to lift a brick of mass 2kg to a height of 3m along a smooth inclined plane 5m long as shown above. The efficiency of the machine is;

A. 75% C. 80% C. 90% D. 98%

40. A body of mass 3kg is acted upon by a force of 20N. If the opposing force is 5N, find the acceleration of the body.

A. $0.75ms^{-2}$ B. $5.0ms^{-2}$ C. $6.67ms^{-2}$ D. $8.30ms^{-2}$

SECTION B

41(a) Define density (1mk)
