NAME:……..……

PERSONAL NUMBER:…….…. SIGNATURE……..

535/1
PHYSICS
Paper 1
July/Aug. 2023
2¼ hours

PROVINCIAL - NAMIREMBE DIOCESE

COUHEIA SECONDARY

MOCK EXAMINATIONS 2023

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* **blue** *or* **black** *ink against each question in the box on the right-hand side.*

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

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

Acceleration due to gravity=10ms^{-2}

Specif0ic heat capacity of water=4200Jkg^{-1}K^{-1}

For Examiner's Use Only

Q.41	Q.42	Q.43	Q.44	Q.45	Q.46	Q.47	Q.48	Q.49	Q.50	MCQ	Total

SECTION A: (40 MARKS)

Answer **all** *questions from this section.*

1. Mosquito eggs floating on water sink when a few drops of paraffin are added to the waterbecause
   A. Paraffin is denser than water.
   B. Surface tension of water increases.
   C. Surface tension of water reduces.
   D. Cohesion of water molecules increases.

2. Which one of the following is true about a periscope? It
   A. Gives a laterally inverted image.
   B. Is used to observe an obscured object.
   C. Is used for viewing distant objects.
   D. Gives a real image of the object.

3. An appliance that uses a current of 4A is connected to the mains by wires that can carry up to5A. The best fuse that can be used for the appliance is
   A. 2A fuse B. 3A fuse C. 4A fuse D.5A fuse

4. The energy change that occur in a loud speaker is
   A. Electrical to sound
   B. Kinetic to sound
   C. Sound to electrical energy
   D. .Potential to sound energy

5.

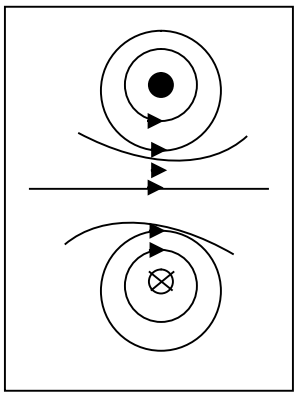


Fig. 7

The diagram in the figure 7 represents a magnetic field pattern caused by a

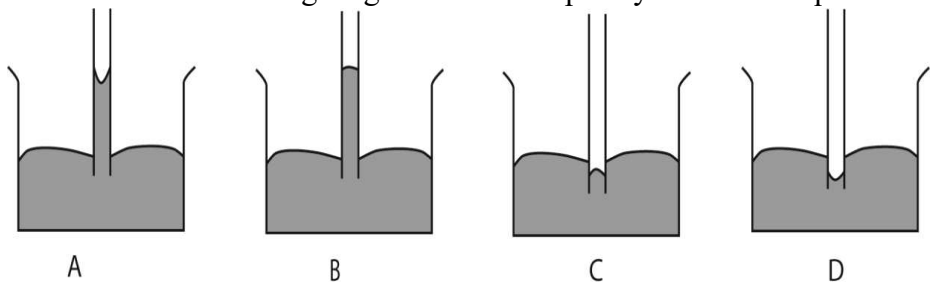
A) Horse shoe magnet B) thin bar magnet

C) Circular coil carrying a current D) long solenoid carrying a current

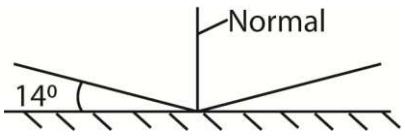
6. The density of a substance is the
   A. Quantity of matter in a unit volume
   B. Volume of a given unit quantity of matter
   C. Pull of gravity on a substance
   D. .Space occupied by the substance

7. When momentum of the body changes,
   A. its weight remain changes
   B. its velocity remain constant
   C. the direction of movement remains constant
   D. the force acting on it changes

8. Which one of the following diagrams shows capillary RISE in a liquid?



9. The figure below shows an incident ray at an angle of 14^o to the reflecting surface. Find theangle between the direction of incident ray and reflected ray.



A. 28^0 B. 76^0 C. 152^0 D. 166^0

10. The heat absorbed by a liquid to change it to vapor at constant temperature is called
    A. Latent heat of fusion
    B. Specific latent heat of fusion
    C. Latent heat of vaporization
    D. Specific latent heat of vaporization

11. Which of the following statements is correct about electrons in an atom?
    (I) they are negatively charged
    (II) they resolve round the neutron
    (III) They are found in the nucleus of an atom.

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

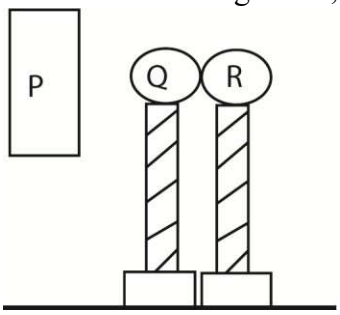
12. Which of the following combinations is of complementary colours?
    (i) red + cyan
    (ii) green + yellow
    (iii) Blue + magenta

A. (i) only B.(ii) only

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

13. A point along the principal axis of a convex lens to which rays parallel and close to the axisconverge after refraction through the lens is
    A. pole
    B. centre of curvature
    C. an optical Centre
    D. principal focus

14. The figure below shows a charged rod, P, brought near conductors Q and R in contact



If P is removed after and Q is POSITIVELY charged, then the charges on Pand R are

	P	R
A.	+	-
B.	-	+
C.	-	-
D	+	+

15. The energy stored in an accumulator is
    A. Heat energy
    B. Electrical energy
    C. chemical energy
    D. mechanical energy

16. Find the density of a rubber bung whose mass is 80g and volume 40cm^3
    A. 0.5kgm^{-3} B. 2.0kgm^{-3} C. 2000.0kgm^{-3} D. 3200.0kgm^{-3}

17. Which one of the following is a set of machines that depend on turning effect of forces for their operation?
    A. The lever, gear and wedge
    B. Hydraulic press, wheel barrow and spanners
    C. Spanners, pulley and wedges
    D. .The lever, spanner and hammers.

18. Which of the following minimizes leakage of magnetic flux in a transformer?
    (i) Laminating the iron core
    (ii) Winding the wires on soft iron
    (iii) Reducing air between the coils
    A. (i) and (ii) only B. (ii) and (iii) only
    C. (i) only D. (i) and (iii) only

19. ${}^{234}_{x}Th \longrightarrow {}^{234}_{90}P\,a + {}^{0}_{-1}e + energy$

The equation above represents decay of radioisotope by beta emission. Find the value of x
    A. 91 B. 144 C. 89 D. 145

20. One of the following statements is true about self-induced e.m.f of a coil?
    A. It increases the e.m.f if the current through the coil is increasing
    B. It decreases the e.m.f if the current through the coil is increasing
    C. It is always in the same direction as the current
    D. It depends on the rate of change of current.

21. The time that elapses between the lightning flash and thunder is 4s. Find the distance of thecloud from observer. (Speed of sound in air is 320ms^{-1})
    A. 80m B 2560m C. 1280m D. 160m

22. The frequency of a note produced on a string decreases when the
    (i) Tension in the string is decreased
    (ii) Length of the string is increased
    (iii) Thickness of the string is increased
    A. (i) and (ii) only B. (ii) and (iii) only
    C. (i) and (iii) only D. (i), (ii) and (iii)

23. An electric bulb rated 80W is connected to the power supply. If a current of 2A flows through the bulb when it is operating, find the resistance of its filament.
    A. 40Ω B. 20Ω C. 160Ω D. 320Ω

24. A mass of 500g produces an extension of 10cm in a spring. Find the extension produced in aspring by a force 10N.
    A. 5cm B. 10cm C. 20cm D.40cm

25. Which one of the following changes when a force is applied on a body?
    (i) Mass
    (ii) Velocity
    (iii) Displacement
    A. (i) and (ii) only
    B. (ii) and (iii) only
    C. (i) and (iii) only
    D. (i), (ii), and (iii)

26. The energy changes that takes place when a stone is fired from a catapult and hits glass are
    A. Kinetic energy → heat + sound →elastic potential energy
    B. Kinetic energy →elastic potential energy → heat + sound
    C. Elastic potential energy → heat + sound → kinetic energy
    D. Elastic potential energy → kinetic energy → heat + sound

27. Which one of the following statements best explains what happens when a negatively chargedcloud passes over the lightning conductor?
    A. Negative charges are attracted to the cloud and positive ions are repelled to the spikes.
    B. Positive ions are attracted to the cloud and negative charges repelled to the spikes
    C. Negative charges are attracted from the earth to the spikes which causes ionization of air
    D. Positive ions and negative ions are lost to the earth.

28. Constructive interference of waves occurs when the two waves are

(i) In phase

(ii) Moving in opposite direction

(iii) Have the same wavelength and frequency

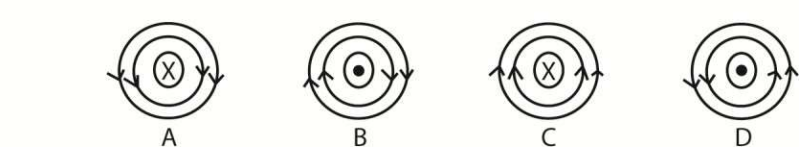
A. (i) only B. (ii) only

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

29. A current of 1A flows through a coll for 20s. If the p.d across the bulb is 5V, find the work done.

A. 100J B. 4J C. 20J D. 0.25J

30. Which one of the following diagrams shows the correct direction of magnetic field around aconductor carrying current?

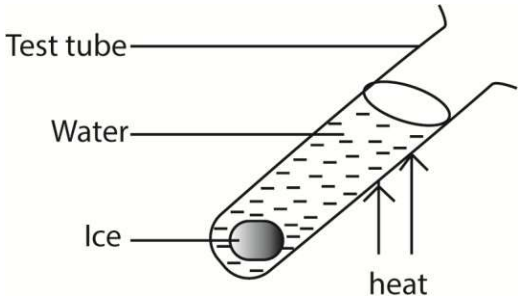


31. The figure below shows energy changes by two devices P and Q.

P and Q are

	P	Q
A.	Dynamo	Motor
B.	Battery	Dynamo
C.	Battery	Motor
D.	Dynamo	Battery

32. The figure below shows a test tube containing water and ice at the bottom



If the test tube is heated near the mouth, by which process does heat reach the ice?

A. Radiation
B. Convection
C. Conduction
D. Evaporation

33. Which of the following properties of cathode rays shows that they carry charge?

(i) They move in straight line
(ii) They are deflected in a magnetic field
(iii) They produce heated X-rays

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

34. When water waves travel from a deep region to a shallow region, the

(i) Wavelength increases
(ii) Speed reduces
(iii) Frequency increases

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

35. An ammeter of resistance 3.0Ω can measure a maximum current of 5.0A. Find the resistance of the resistor needed to connect it to an ammeter which can read to 20.0A

A. 0.75Ω B. 1.0Ω C. 15Ω D. 60Ω

36. Energy from the sun reaches the earth by

A. Interference
B. Convection
C. Conduction
D. Radiation

37. A girder which is under compression is called a

A. Strut B. beam C. wedge D. tie

38. Photo electric emission is the giving off of electrons from a

A. Heated metal
B. Metal bombarded with energetic particles
C. Metal irradiated with electro-magnetic radiation
Metal subjected to a strong magnetic field

39. Which one of the following can be used to detect infra-red radiation?

A. Photographic film

B. Aerials
C. Geiger-Muller tube
D. Ionization chamber

40. The cost of running a lamp rated 60V, 50A for 2hours is shs. 200. Find the cost per unit ofelectricity.

A.sh1200 B. sh66.6 C.sh 33.3 D.sh1200000

SECTION B

41. (a) Define the terms:

(i) Amplitude (1mark)

(ii) Frequency (1mark)

(b) A tube closed at one end resonates at a length of 38.5cm and again at 98.5cm when tuning fork of frequency 0.275KH is held near its open end. Find the velocity of sound. (2marks)

---

42. (a) What is a step-down transformer? (01 mark)

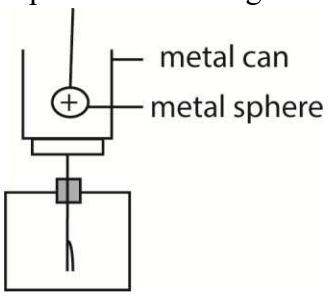
(b) Draw a well labeled diagram of an a.c a transformer. (02 marks)

(c)Give one advantage of a cover d.c. (1 mark)

---

43. (a) State the law of charges. (01marks)

(b) A small metal sphere carrying a positive charged is lowered gently into an uncharged gold-leaf electroscope as shown in figure below



(i) State what happens to the leaf of the electroscope. (01mark)

(ii) Explain the observation in (b)(i) above. (02marks)

---

44. (a) Define the following

(i) Work (01mark)

(ii) Energy (01mark)

(b) A pulley is used to raise a load of 80kg through 15m in 0.5minutes. Find the average powerexpended. (02marks)

---

45. (a) State the laws of reflection of light. (02mark)

(b) With the aid of a diagram, describe what is meant by diffuse reflection? (02mark)

46. (a) State two factors which affect the resistance of a metal conductor? (01mark)

(b) Explain why cells should never be left connected in parallel. (01mark)

(c) The filament of a lamp is rated 120V, 30W. Calculate the resistance of the filament. (02marks)

---

47. (a) Define the following

(i) Linear Momentum (01mark)

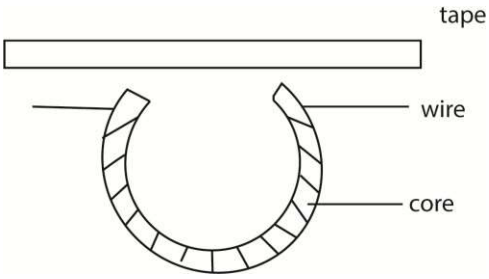
(ii) Kinetic energy (01mark)

(b) A trolley A of mass 5kg travelling at $9ms^{-1}$ collides with a stationary trolley B of mass 4kg. After collision they both move together at $5ms^{-1}$. Find the loss in kinetic energy. (02marks)

---

48. (a) What is magnetic field? (1mark)

(b) The figure below shows the head of a cassette tape recorder.



(i) Explain why a current through the wire causes the tape to become magnetized. (2marks)

(ii) The tape is usually made of plastic and coated with a thin layer of iron oxide. Why isiron oxide used? (1mark)

---

49. (a) What is meant by the term radioactivity?

(b) $^{232}_{90}A \xrightarrow{(i)} {}^{232}_{91}B \xrightarrow{(ii)} {}^{232}_{92}C \xrightarrow{(iii)} {}^{228}_{90}D$

The above equation shows three stages (i), (ii) and (iii) of radioactive series.

(i) Name the particles emitted at stage (ii) and stage (iii) of the series. *(02 marks)*

(ii) Which of the nuclei A, B, C, and D are isotopes? *(01 mark)*

---

50. A steel rod of cross-sectional area 128 m^2 is 8 m long. When a force of 3.2 x 10^5 N is applied to the rod, its length increases by 4 mm. Calculate the

a) stress in the rod, *(02 marks)*

b) Strain produced. *(02 marks)*

END