Name ……. Centre/ index No……..

Signature ……...

535/1

PHYSICS

Paper 1

July – August 2013
BUGIRI DISTRICT SECONDARY SCHOOLS EXAMINATIONS BOARD

(BUDSSEB)

UGANDA CERTIFICATE OF EDUCATION

MOCK EXAMINATIONS 2013

PHYSICS

PAPER 1

$2\frac{1}{4}$ Hours

INSTRUTIONS TOCANDIDATES.

Write your name, signature and index number clearly in the space 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.

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

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

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

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

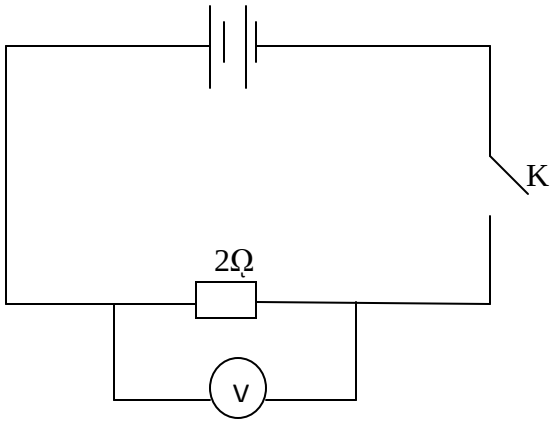
FOR EXAMINERS' USE ONLY

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

SECTION A

Answer all questions in this question.

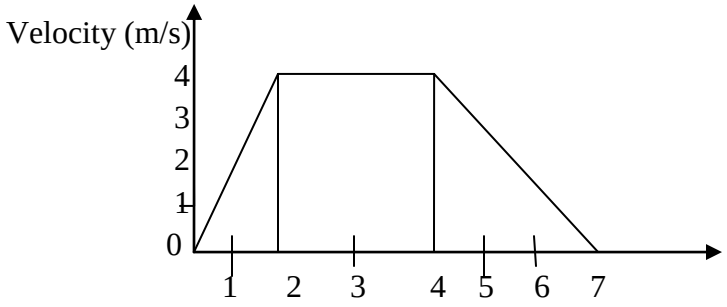
1. Sound travels much greater through
   A. Water
   B. Nitrogen gas
   C. Steel
   D. Wood
2. What happens to periodic time of a simple pendulum
   A. Decreases as the length of the pendulum decreases
   B. Increases as the mass of the pendulum increases
   C. Increases as the mass of the pendulum bob decreases
   D. Decreases as the length of the pendulum increases
3. What current is taken by an electric appliance rated 1000W, 250W
   A. 0.25A
   B. 0.40A
   C. 4.00A
   D. 2.50A
4. A batter of two cells each of e.m.f 1.5V and internal resistance of 0.5Ω is connected in series with a 2Ω as shown in figure 1.



   What will be the reading of the voltmeter when switch, K, is closed?
   A. 1.5V
   B. 3.0V
   C. 1.0V
   D. 2.0V
5. A device that converts kinetic energy to electrical energy is
   A. An electric motor

B. A combustion
C. A dynamo
D. An accumulator

6. What happens when a longitudinal wave passes through a medium?
   A. Particles of the medium vibrate parallel to the direction of propagation of the wave.
   B. Particles move along with the wave
   C. Particles of the medium vibrate perpendicular to the direction of propagation of the wave
   D. Particles of the medium move in the opposite direction to the wave.
7. Fig 2.



   Use the velocity- time graph in figure 2 above to find the distance covered during deceleration
   A. 4 m
   B. 6 m
   C. 8 m
   D. 10 m
8. The most economical means of transmitting electricity from a water fall dam is to the factory in SOROTI is
   A. At a high voltage and low current.
   B. At a high voltage and high current.
   C. At a low voltage and high current.
   D. At a low voltage and a low current.
9. A device John loved connect to the secondary coil of a transformer in order to get a d.c in the output is
   A. Resistor.
   B. Rheostat.
   C. Diode.
   D. Thermostat.
10. All buildings are recommended to have earthed conductors in order to
   A. Reduce heat intensity on hot days.
   B. Remove excess electrons from the buildings.

C. Stabilize the current electricity to the buildings.
D. Provide more charges to electric appliances in the building.

11. All connections to power point in house wiring system are in parallel so as to
    A. Supply the same current.
    B. Minimize cost of electricity.
    C. Operate at the same voltage.
    D. Consume the same amount of energy.
12. An engine exerts a force of 2000N at a speed of $15ms^{-1}$. What power is developed by the engine in Kw?
    A. 30,000
    B. 3,000
    C. 30
    D. 300
13. A block of lead of mass of 1000g hits a hard surface without rebounding with a velocity of 23 ms^{-1}. Given its temperature rises from 25^0C to 27^0C. Find the specific heat capacity of lead
    A. 264.50 $JKg^{-1}{}^0C^{-1}$
    B. 9.79 $JKg^{-1}{}^0C^{-1}$
    C. 5.75 $JKg^{-1}{}^0C^{-1}$
    D. 132.25 $JKg^{-1}{}^0C^{-1}$
14. How many kilowatt hours are used to run 8 KW cooker for I hour, 3KW immersion heater for 40 min and 960 W hair drier for 20 mins?
    A. 10.32 KWh
    B. 147.20 KWh
    C. 971.00 KWh
    D. 768.00 KWh423
15. Which one of the following explains what happens to an air bubble introduced at the bottom of a jar containing mercury?
    A. It will rise to the surface while decreasing in size.
    B. It will rise to the surface while increasing in size.
    C. Nothing will happen to the bubble.
    D. It will be pressed by the mercury column and burst.
16. A transformer s used to step down an alternating voltage from 240 V to 12 V. Find the number of turns on the secondary coil if the primary coil has 1200 turn.
    A. 5
    B. 3
    C. 60
    D. 100
17. The moving coil galvanometer can be made more sensitive by using
    A. Smaller coil

B. Weaker hair spring
C. Weaker magnet
D. Fewer turns of wire on the coil.

18. Which one of the following radiations when passed through a narrow aperture produces the largest diffraction?
A. Gamma rays
B. Infra red rays
C. Radio waves
D. Yellow light.

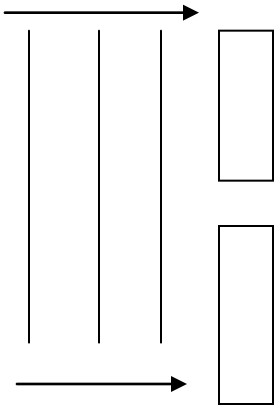
19. What happens to induced current in a generator?
A. Is minimum when the coil is horizontal.
B. Increases with increase in the speed of rotation.
C. When the coil is vertical, it is maximum.
D. When the coil is horizontal, it changes the direction.

20. A heater connected to 200V main has a resistance of 10 ohms. What is the cost of losing the heater for 240 minutes if each unit of energy costs shs. 35?
A. Shs 1400
B. Shs. 560
C. Shs. 5600
D. Shs. 140

21. At constant pressure, the velocity of sound in air
A. Increases with increase in temperature.
B. Decreases with temperature
C. Increases with loudness
D. Decreases with loudness.

22. Evaporation rate from the body can be increased by
(i) Temperature
(ii) Pressure
(iii) Liquid with greater cohesive force
(iv) Dryness of air around the body.
A. (i) and (ii) only
B. (iii) only
C. (i) and (iv) only
D. (ii) and (iii) only.

23. Fig 3.



The diagram in figure 3 shows parallel wave fronts approaching a narrow gap. Waves passing through the gap are likely to undergo

A. Refraction.
B. Reflection.
C. Interference.
D. Diffraction.

24. Which of the following shows a pattern on the screen of cathode ray oscilloscope when a d.c voltage is connected across the Y – plates with time base switched on?

A. 

B. 

C. 

D. 

25. Thorium has a half – life of 24 hours. How many hours would it take 8 Kg of thorium to disintegrate to 1 kg?

A. 24
B. 72
C. 3
D. 96.

26. Fig

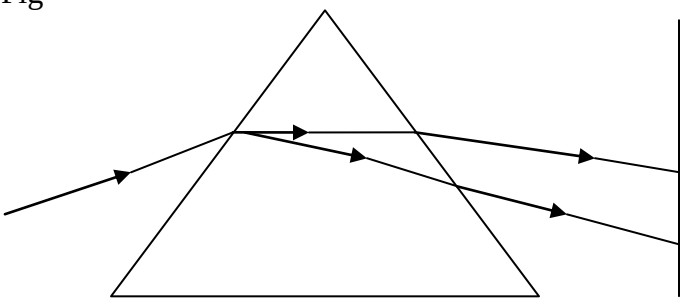
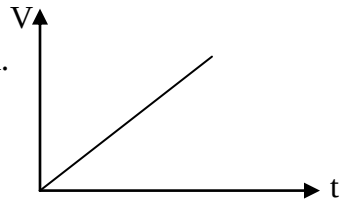


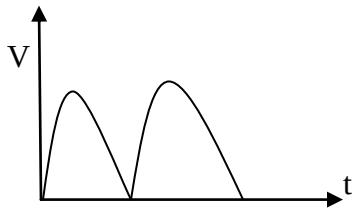
Figure four shows a white light passing through a glass prism. Which colour is bent most?

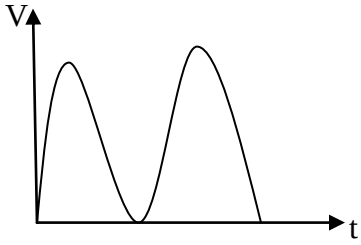
A. Red

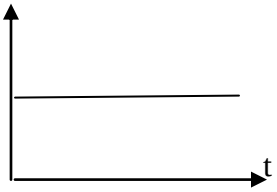
B. Green
C. Violet
D. Yellow

27. The out - put voltage from a d.c dynamo can be represented graphically using.

A.


B.


C.


D.


28. A car of mass 20, 000 grams moves with a uniform veleocty of 4 ms^{-1} from rest. What is its momentum?
A. 80 $kgms^{-1}$
B. 5 $kgms^{-1}$
C. 160 $kgms^{-1}$
D. 320 $kgms^{-1}$

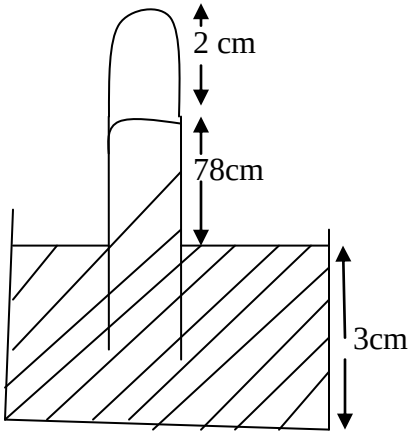
29. The temperature at which all the heat energy is removed from a substance is called
A. Kelvin temperature
B. Freezing temperature
C. Absolute zero temperature

D. Celsius temperature

30. The temperature of a mass of a gas at 10^5pa is 17^0c if the volume remains constant.
    A. $\frac{27}{17}$ X 10^5 pa
    B. $\frac{17}{27}$ X 10^5 pa
    C. $\frac{290}{300}$ X 10^5 pa
    D. $\frac{300}{290}$ X 10^5 pa

31. The cores of a transformer are laminated in order to
    A. Distribute the voltage output equally within the transformer
    B. Reduce eddy currents
    C. Decrease the resistance of the coils
    D. Determine the energy lost by the transformer

32.



The diagram above in figure 5 shows a mercury barometer. Find the value of the atmospheric pressure
    A. 80 cm
    B. 78 cm
    C. 81 cm
    D. 79 cm

33. Element R emits radiation K forms element P as in equation below.

$$_{Z}^{A}R \longrightarrow {}_{Z+1}^{A}P + K$$

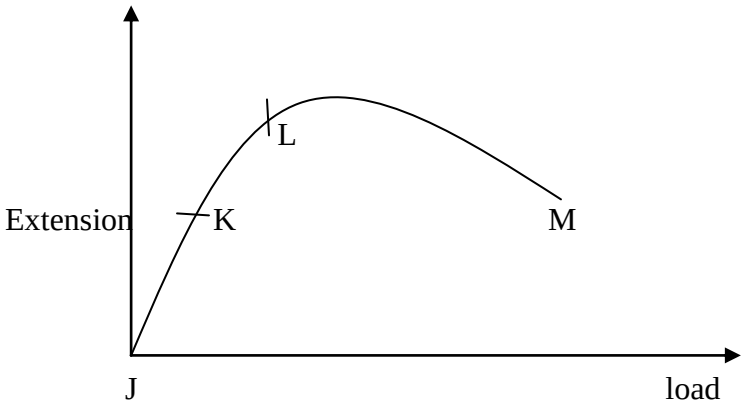
Where A and Z are mass and atomic number respectively. The radiation K is

    A. Beta particle
    B. Alpha particle

C. X – rays
D. Gamma rays

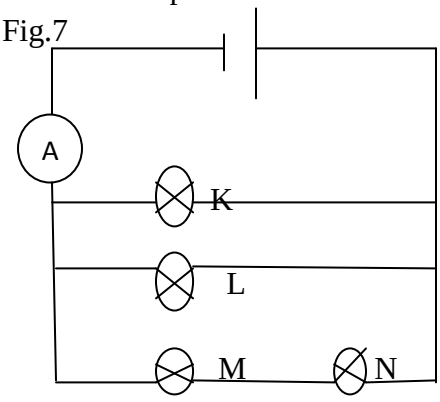
34. A bullet of mass 100g is fired from a riffle of mass 5000g. The riffle recoils with a velocity of 16 ms^{-1}. Calculate the velocity with which the bullet is fired?
A. 210 ms^{-1}
B. 66 ms^{-1}
C. 110 ms^{-1}
D. 800 ms^{-1}

35.



The diagram in figure 6 shows a graph that represents the extension of a wire with increasing load. At what region does the yield point occur?
A. Between points J and K.
B. At point M.
C. Between points L and M.
D. Between points K and L.

36. Fig.7



In figure 7, the ammeter indicates the current through

A. Lamp K and L

B. Lamps K only

C. Lamps K, L, M and N.

D. Lamps L, M and N.

37. Fig 8

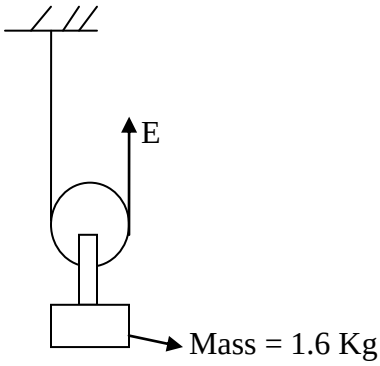


Figure 8 shows a light smooth pulley used to lift a mass of 1.6 kg by applying an effort E. The mechanical advantage of the system is

A. 1

B. 2

C. 128

D. 0.5

38. Which one of the following is used to obtain a high voltage d.c from low voltage d.c?

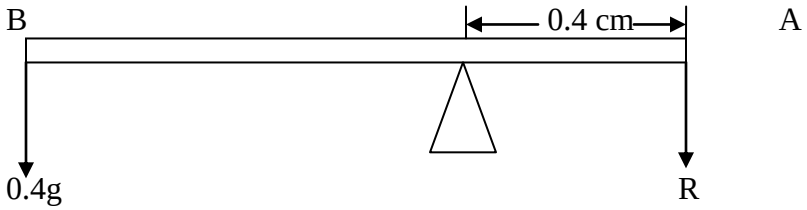
A. Generator

B. An induction coil

C. A dynamo

D. A transformer

39. D



A uniform metre rule of weight 2N is pivoted at 0.4 m mark from end A to B. Find the value of the force, R, required to keep the metre rule in equilibrium if the mass of 0.4 kg acts at the end of the metre rule as shown in the diagram above.

A. 6 N

B. 5.5 N

C. 2 N

D. 6.5 N

40. Given ${}^{y}_{x}R$ and ${}^{L}_{m}P$ are isotopes, then;

A. x = m

B. y = L

C. x = L

D. y = m

SECTION B.

Answer all questions in this section.

41. (a) What is meant by the following?

(i) Cohesion forces

……

……

……(1 mark)

(ii) Adhesion forces

……

……

……(1 mark)

(b) Use sketch diagrams to show the level of liquid in the capillary tube if immersed in a liquid which has greater

(i) Cohesion than adhesion forces

(ii) Adhesion than cohesion forces

42. (a) Explain briefly how a bulb which operates on 3.0V d.c can raw power from a 250V main supply

……
……
……
…….....(2 marks)

(b) State two sources of energy loss in a transformer

……
……..(2 marks)

43. (a) Draw a sketch of the variation of volume with temperature in Kelvin for a gas that obeys Charles law.

(b) Give any two advantages of mercury as a substance to be used in a thermometer.

……
……
……(1 mark)

(c)State any two factors that affect the rate of evaporation

……
…….(1 mark)

44. (a) What is meant by thermionic emission?

……
……
…….(1 mark)

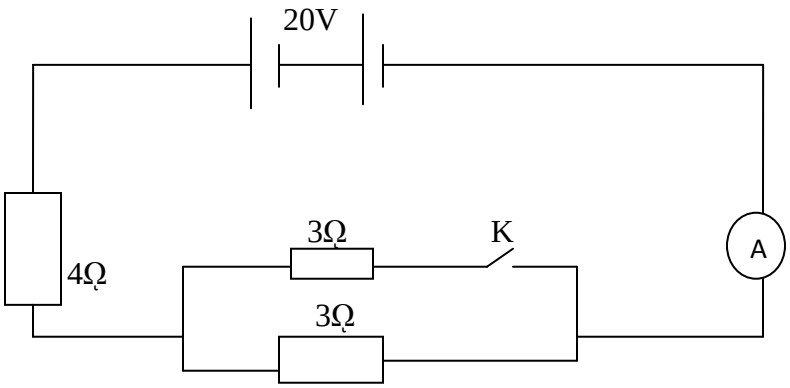
(b) What is the function of fluorescent screen in a cathode ray oscilloscope?

……
…….(1 mark)

(c) State any two applications of a cathode ray oscilloscope.

……
……
……(2 marks)

45. A battery of emf 20V and negligible internal resistance is connected to resistors of 3Ω, 3Ω and 4Ω as shown in figure 8.



What is the ammeter reading when switch K is ?

(i) Closed

(2 marks)

(ii) Open

(2 marks)

46. The specific heat capacity of water is 4200 J/Kg/K. What is meant by the above statement?

……
……
……(1 mark)

(b) State two reasons why water is used in the cooling system of a tractor engine?

……
……
…… (2 marks)

(c) What is the use of a vaccum in a thermos flask?

……
……(1 mark)

47. (a) Draw a sketch diagram to show the formation of a solar eclipse.

(b) Calculate the critical angle of a glass of refractive index 1.62.

(2 marks)

48. (a) State two advantages of a nickel – iron accumulator over a lead accumulator.

……
……
……
……
……
……(2 marks)

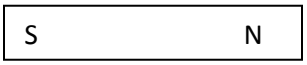
(b) State the gasses evolved during the charging f lead acid accumulator.

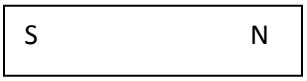
……
……(1 mark)

(c) Why is a dry cell called a primary cell?

……
…….(1 mark)

49. (a) The arrangement below shows two identical bar magnets near each other. Sketch the resultant magnetic field pattern.



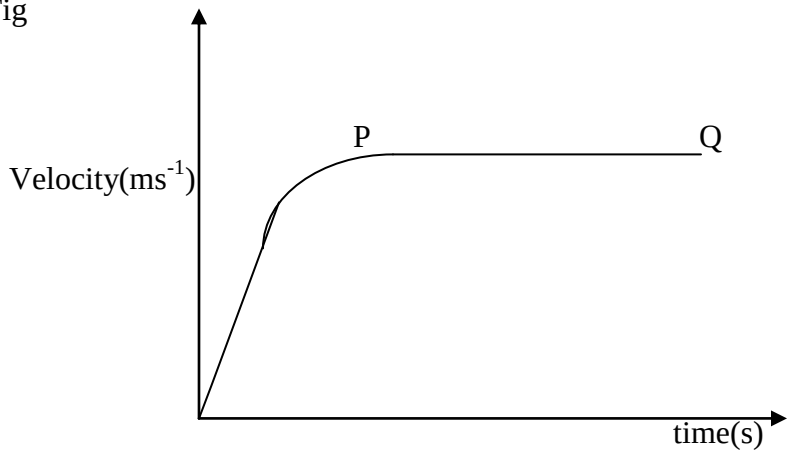


(2 marks)

(b) State any two ways of demagnetizing a bar magnet.

……
……
……
……(2 marks)

50. Fig



The velocity – time graph above shows the motion of a ball bearing dropped centrally down a tall column of liguid.

(a)Name the forces and their direction which act on the ball bearing.

……
……
……
……($1\frac{1}{2}$ marks)

(b) Explain briefly what happens to the ball bearing between P and Q?

……
……
……
……
……
……($2\frac{1}{2}$ marks)