NAME……..…….. ADMN NO ……CLASS……

DATE..…….…….……... SIGNATURE ……..……

PHYSICS

PAPER 2

232/2

FORM 4 TERM 2 SEPTEMBER 2022

MURANG'A EXTRA COUNTY SCHOOLS JOINT EXAMINATION

Kenya Certificate of Secondary Education.

232/2 PHYSICS

PAPER 2

TIME: 2 HOURS.

INSTRUCTIONS TO CANDIDATES

A) This paper consists of two sections A and B.

B) Answer all the questions in sections A and B in the spaces provided.

C) Non-programmable silent electronic calculators may be used.

D) This paper consists of 11 printed pages.

E) Candidates should check the questions to ascertain that all the pages are printed as indicated and that no question is missing.

FOR EXAMINER'S USE ONLY.

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-13	25	
B	14	10	
	15	13	
	16	11	
	17	11	
	18	10	
TOTAL		**80**	

SECTION A: (25MARKS)

1. What is observed when the hole of a pinhole camera is enlarged? (1mk)

   ……

   ……

2. State one use of a charged electroscope (1mk)

   ……

   ……

3. The chart below shows an arrangement of a section of the electromagnetic spectrum

P	Q	R	UV Light	S	Gamma rays

   Name the radiation represented by letter Q (1mk)

   ……

4. Draw a circuit diagram to show P-N junction diode in the forward biased mode. (2mks)

   ……

   ……

   ……

   ……

5. Explain why the walls of studio are padded with woolen materials (1mk)

   ……

   ……

6. (a) Define half- life as used in radioactivity (1mk)

   ……

   ……

(b)The initial mass of a radioactive substance is 20g.The substance has half-life of 5yrs.Detemine the mass remaining after 20yrs. (2mks)

……

……

……

7. Give a reason why it is necessary to leave the caps of the cells open when charging lead-acid accumulator (1mk)

……

……

8. (a) State one property of soft iron that makes it suitable for use as a transformer core. (1mk)

……

……

(b)The primary coil of a transformer has 1200 turns and the secondary coil has 60 turns. The transformer is connected to a 240V a.c source. Determine the output voltage. (3mks)

……

……

……

……

9. State two ways of minimizing electrical power losses during transmission (2mks)

……

……

10. A convex mirror is preferred to a plane mirror for use as a driving mirror. Explain why. (1mk)

……

……

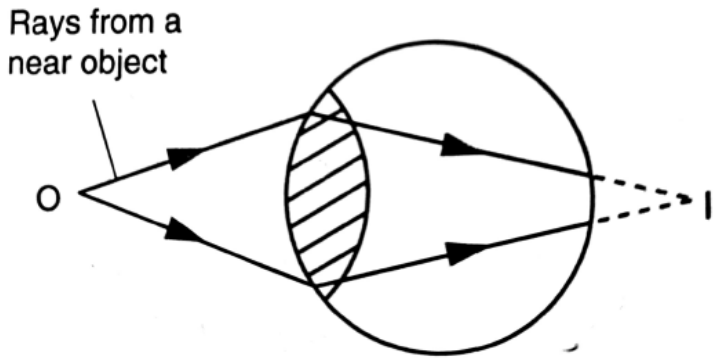
11. An electric bulb is rated 60W, 240V. Determine the current that flows through it when it is connected to a 240v supply (2mks

……

……

……

12. The figure below shows a defect of vision



(i) Name the defect. (1mk)

……

(ii) List two possible causes of the defect. (2mks)

……

……

13. A broadcasting station produces radio waves of wavelength 600m. Determine their frequency in MHz (speed of air is $3X10^8$m/s) (3mks)

……

……

……

……

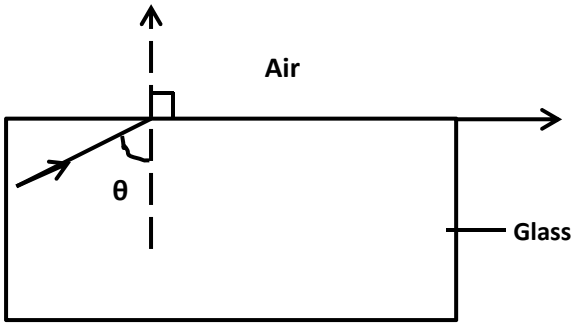
SECTION B (55MARKS)

14. (a) Define the refractive index of a medium (1mk)

……

……

(b) The figure below shows a ray of light incident on a glass-air interface



Given that the refractive index of the glass is 1.5, determine angle θ (3mks)

……

……

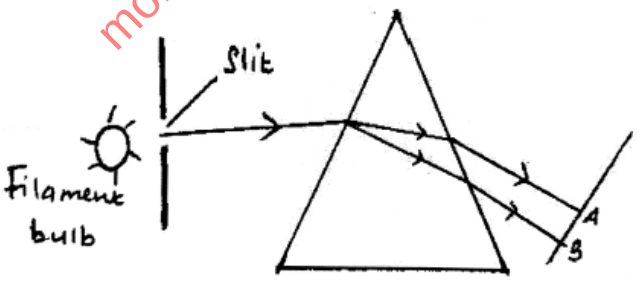
……

(c) State one condition for total internal reflection to occur (1mk)

……

……

(d) The diagram below shows a narrow beam of white light shone onto a glass prism



(i) What is the phenomena represented in the diagram? (1mk)

……

(ii) Name the colours at A and at B (2mks)

……

……

(iii) Explain the reason for your suggestion of the colours named above. (1mk)

……

……

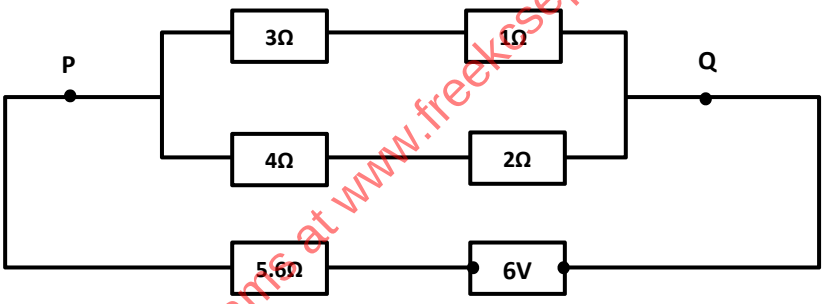
(iv) What is the purpose of the slit. (1mk)

……

15. (a) State one factor that affect the resistance of a metallic conductor (1mk)

……

(b) The figure below shows resistors in a circuit. The internal resistance of the battery is negligible



(i) Calculate the effective resistance of the circuit (2mks)

……

……

……

(ii) Find the total current in the circuit (2mks)

……

……

……

……

(iii) Find the P.d between P and Q (2mks)

……

……

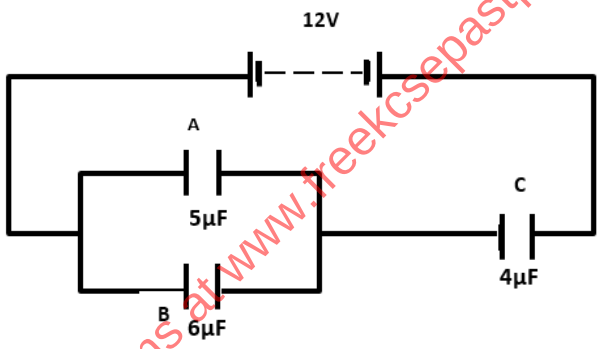
……

(c) What is the effect of decreasing the distance between the plates of a parallel plate capacitor on the capacitance (1mk)

……

……

(d) The figure below shows electrical circuit with three capacitors A, B and C of capacitance 5µF, 6µF and 4µF respectively connected to a 12V battery



Determine

(i) The combined capacitance of the three capacitors (2mks)

……

……

……

(ii) The potential difference across the capacitor B (3mks)

……

……

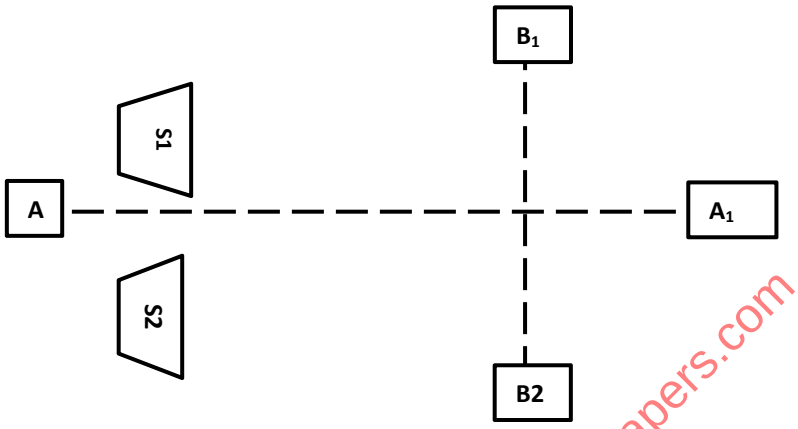
……

16. (a) Name two factors which determine the frequency of sound from a stretched wire at room temperature (2mks)

……

……

(b) The figure below shows two loud speakers S_1 and S_2 connected to a signal generator



(i) An observer walks along B_1B_2. State what is observed. (1mk)

……

(ii) Give reasons for observation above (2mks)

……

……

……

(iii) Another observer walks along AA_1, state and explain what he observed (2mks)

……

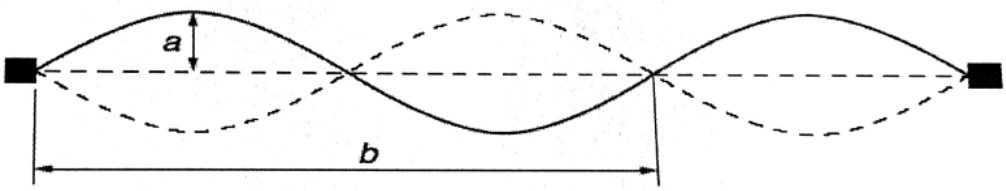
……

……

……

……

(c) A stretched string is vibrating between two fixed ends. The figure shows how the string is vibrating



(i) State the name of: (2mks)

[I] Distance a:

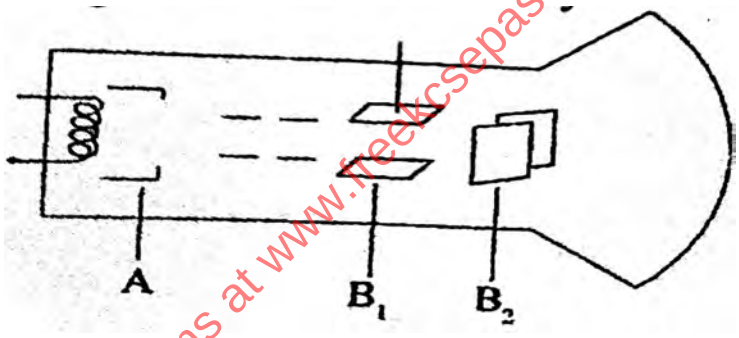
……

[I] Distance b:

……

(ii) On the diagram, label the node and the antinode (2mks)

17. The figure below shows a block diagram of a cathode ray oscilloscope(CRO)



(a)(i)State the names of the parts labelled B_1 and B_2 (2mks)

……

……

(ii)State and explain the function of the part marked A (2mks)

……

……

(ii)Why is the tube highly evacuated? (1mk)

……

……

(b)Give a reason why the target in an X-ray tube is made of tungsten or molebdnum (1mk)

……

……

(c) X-rays are used for detecting cracks inside metal beams.State with a reason which type of X-rays is used. (2mks)

……

……

(d) In a certain X-ray tube the electrons are accelerated by a p.d of 12kV.Assuming all the energy goes to produce X-rays, determine the frequency of the X-rays produced .(Planks constant h=6.62x10^{-34} Js and charge of an electron =1.6x10^{-19}C) (2mks)

……

……

……

18.(a) state two factors that affect photoelectric emission (2mks)

……

……

……

(b)Light of wavelength 4.0x10^{-7} m is incident on two different metal surfaces ,nickel and potassium (Take speed of light as 3.0x10^{8} m/s and planks constant h=6.63x10^{-34}Js)

(i)Determine the energy of the incident radiation (3mks)

……

……

……

……

……

(ii)If the work function of nickel is 8.0×10^{-19} J and that of potassium metal is 3.68×10^{-19} J state with a reason which of the two metals given light will eject electrons (2mks)

……

……

……

……

……

(iii)Determine the velocity of the emitted electrons from the metal surface in b(ii).(Take mass of an electron as 9.1×10^{-31} kg) (3mks)

……

……

……

……

……

……

……

……

……

……