NAME:……INDEX NO. ……ADM NO…..

Signature: ……

Date: ……

Kenya Certificate of Secondary Education
PHYSICS
232/2
MARCH / APRIL 2018

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

- ***Answer all the questions in the spaces provided.***
- ***The paper consists of sections A and B.***
- ***All workings must be clearly shown.***
- ***Mathematical tables and electronic calculators may be used.***

FOR EXAMINER'S USE ONLY:

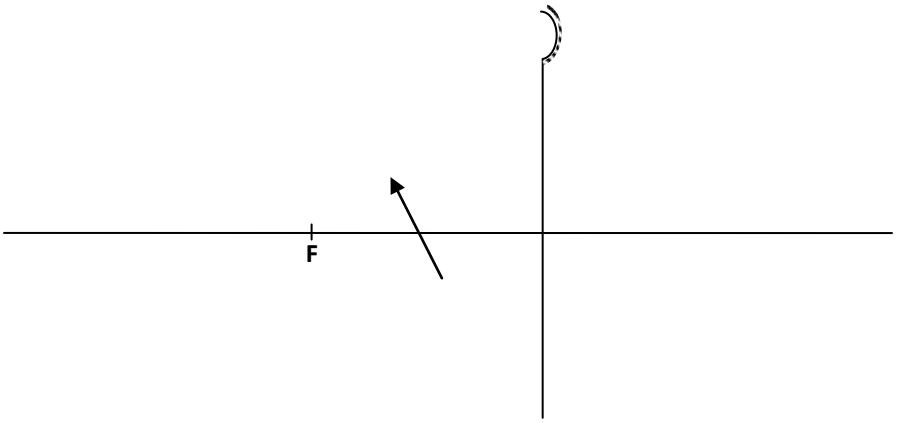
SECTION	QUESTION	MAXIMUM SCORE	STUDENT'S SCORE
A	1 – 11	25	
B	12	4	
	13	13	
	14	11	
	15	14	
	16	13	
TOTAL SCORE		80	

SECTION A (25 MARKS)

1. On the diagrams below, show how a plane mirror gives a wider field of view than a convex mirror. (2mks)

2. A girl observes a man hammering a post into the ground repeatedly and she hears the sound at the same time as he strikes each blow. If the interval between the blows is 2 seconds and speed of sound in air is 330m/s. How far is she from the man? (3mks)

3. The diagram below shows an object placed in front of a concave mirror.

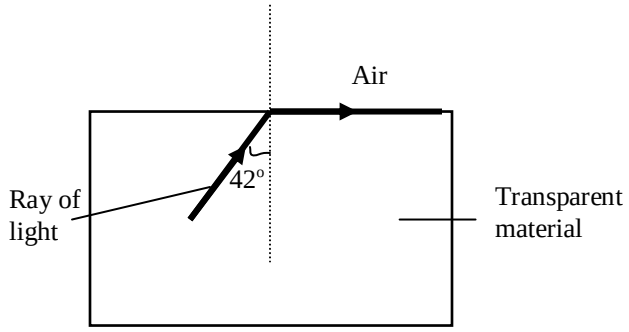


Using ray diagrams locate the image and give one characteristic. (3mks)

4. A converging lens forms an image on the screen which is three times the object. Determine the focal length of the lens if the distance between the object and the screen is 80 cm. (3mks)

5. State the conditions under which total internal reflection occur. (2mks)

6. The following figure shows the path of a ray of light through a transparent material placed in air

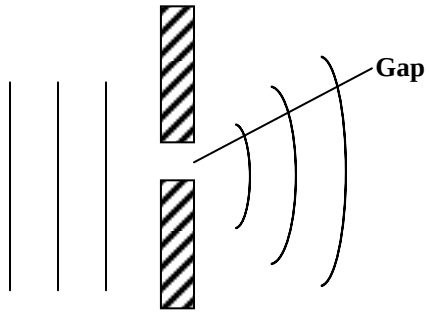


Determine the refractive index of the transparent material (2mks)

7. Give one important use of each of the following waves.

a). X-rays		3mks
b). Infra red		
c). Microwaves		

8. The figure below shows a wave front before and after passing through an opening as shown.



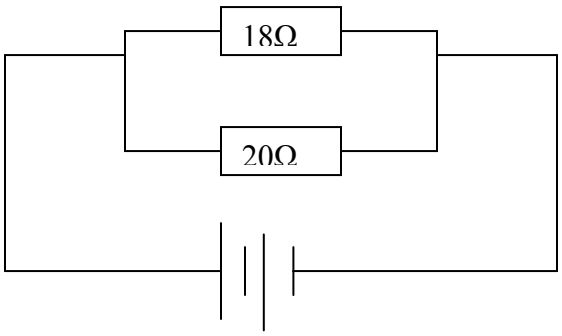
State what would be observed on the pattern after passing the opening if ;

i) Wavelength is increased (1mk)

ii) Gap is increased (1 mk)

9. Draw the magnetic field pattern between two wires carrying current as shown in the figure below. (1mk)

10. In the circuit shown, the power dissipated by the 18 Ω resistor is 8 watts. If the battery has no internal resistance, determine the emf. (2marks)

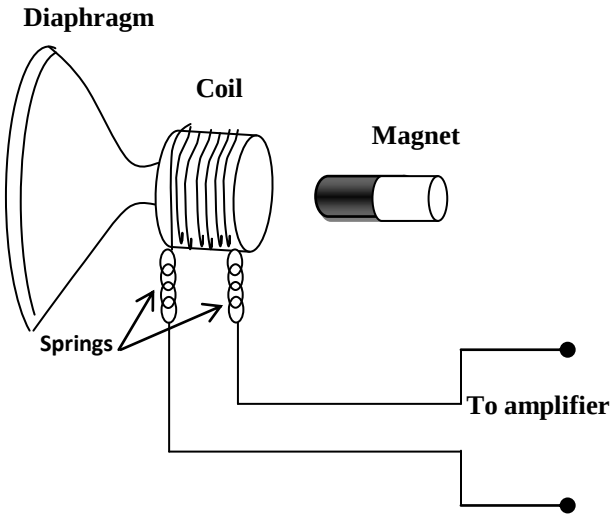


11. State two uses of echoes (2mks)

SECTION B (55 MARKS)

12. a) State Faraday's law of electromagnetic induction (1mk)

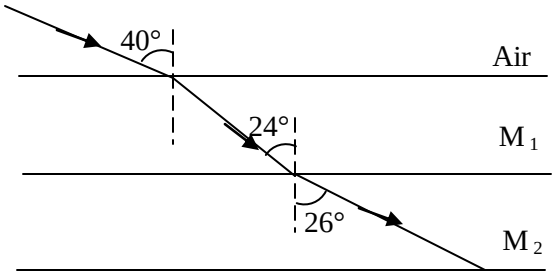
b) An induction microphone converts sounds waves into electrical signals which can be amplified.



Describe the stages by which the sound waves are converted into electrical signals (3mks)

13. (a) Define refraction of light. (1mk)

(c) A ray of light travels from air into medium 1 and 2 as shown in the figure below.



Determine:

(i) the refractive index of medium (1) (η_1). (3mks)

(ii) the critical angle of medium 1. (3mks)

(iii) the refractive index of medium 2 relative to medium 1 ($_1\eta_2$). (2mks)

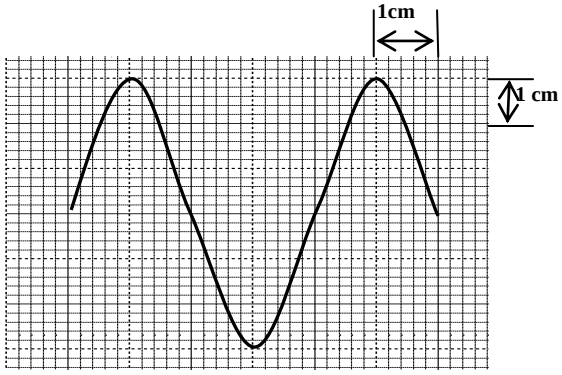
(iv) Velocity of light in medium 2 given that velocity of light in air = 3.0×10^8 m/s. (4mks)

14. a) State the functions of the following parts of a C.R.O.

i) Grid (1mk)

ii) Anode (1mk)

b). The figure below shows the voltage of an a.c generator on the screen of a C.R.O

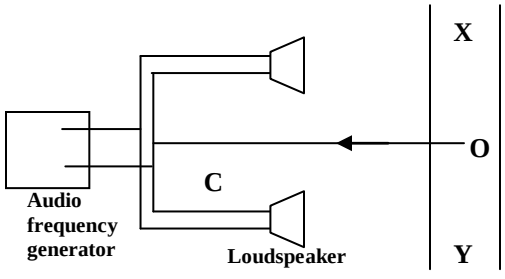


If the time base calibration is 20ms/cm and the Y gain is 5V/cm

i) Calculate the frequency of the generator. (2mks)

ii) Calculate the voltage of the generator. (2mks)

c). Fig. below shows the set up used to demonstrate interference of sound



i). An observer O, moves along XY, state the observation(s) made. (1mk)

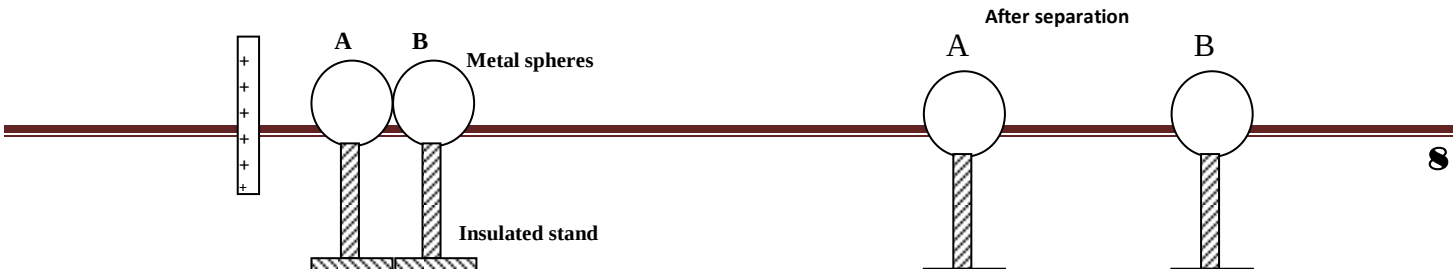
ii). Sketch a waveform that would be observed if a cathode ray oscilloscope is moved a long line XY. (2mks)

iii) What will an observer hear if he moves along the line OC? (1mk)

iv) Why are the loudspeakers connected to the same audio –frequency generator? (1mk)

15. a). Two metallic spheres A,B stand in contact as shown. A positively charged rod is held near sphere A.

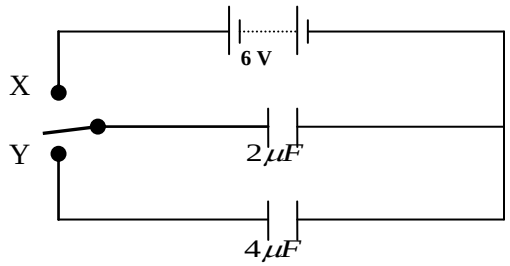
i). Show the charge on each sphere when the metallic balls are separated and the rod is removed. (2mks)



ii) Why are the balls supported on insulated stands? (2mks)

b) State two factors that determine capacitance of a parallel plate capacitor. (2mks)

c). The figure shows a circuit where a battery of e.m.f 6V, a voltmeter, switches X and Y, two capacitors of capacitance 2 μF and 4 μF are connected



i) Determine the charge stored in the $2\mu F$ capacitor when switch X is closed and switch y is open. (2mks)

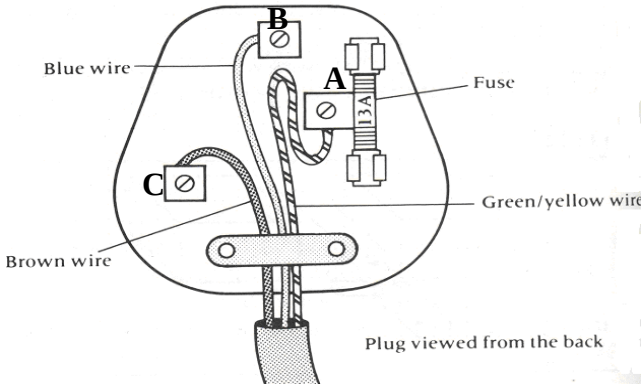
ii) When the switch y is finally closed and switch x is open, determine the potential difference across each capacitor. (2mks)

d). A dry cell can deliver 0.15 A when connected to an 8.0 Ω resistor. When connected to another 8.0 Ω is connected in series with the first, the cell can only deliver 0.08A to the combination. Use this information to calculate:

i). The internal resistance of the cell. (2mks)

ii). The e.m.f of the cell. (2mks)

16. The figure below shows a connection to the pin plug.



a) Name the parts A, B and C (3mks)

A -

B -

C -

b) Why is the earth pin normally longer than the two pins? (1mk)

c) Identify one mistake in the three pin plug (1mk)

d) What is the purpose of the following? (2mks)

i). Fuse	
ii). Earthing	

e) A consumer has the following appliances operating in the laboratory for the times indicated in one day

Appliance	**Time**
1. 2 Fluorescent tubes (40W)	12 hrs
2. one 500 W fridge	24 hrs
3. one 3kW electric heater	3 hrs

i) Calculate the total power of the appliances used (2mks)

ii) If the operating voltage is 240 V. How much current is drawn from the mains? (2mks)

iii). Calculate the total electrical energy consumed in 20 days, assuming the power consumption per day is the same. (2mks)