Name of school……

Candidates Name……index No……..

NAKURU DISTRICT TRIAL EXAMINATION
JULY/AUGUST EXAMINATIONS 2013

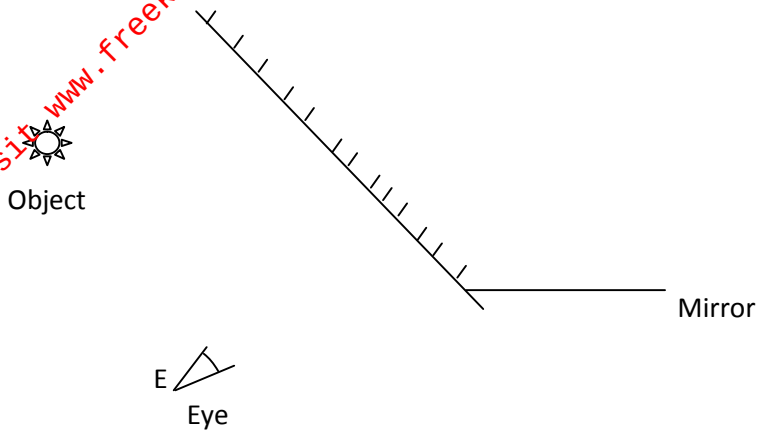
JULY/AUGUST EXAMINATIONS 2013
PHYSICS PAPER 232/2
TIME 2HRS

INSTRUCTIONS TO CANDIDATES

- This paper consists of two sections A and B.
- Answer both sections in the spaces provided in the question paper.
- All working must be clearly shown.
- Electronic calculators may be used.

Section A (25mks)

1) The figure 1 shows an object as viewed by an eye E. Indicate the position of the image. (2 Marks)



2) State what determines the carrying capacity of an accumulator. (2mks)

3) Kotutu noticed that any time he a light from his car and close the door holding the metallic hand he get a slight shock. Explain. (2mks)

4) Distinguish between an amplitude and wavelength of a wave. (1mk)

5) The figure 2 show two metal spheres being charged by one of the method.

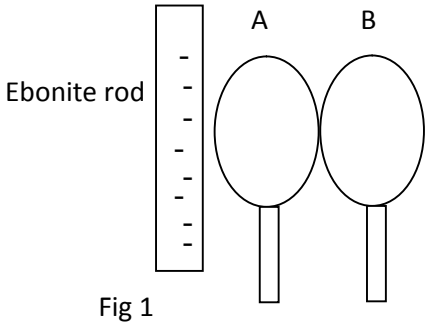


Fig 1

Indicate the charges on sphere A and B. (2mks)

6) Define the critical angle C. (1mk)

7) The figure 2 shows a circuit diagram with cells in parallel. Each cell has e.m.f of 1.5V and internal resistance of 0.5Ω and the resistance of the bulb is 6Ω each. Determine the ammeter reading when the switch is closed. (3mks)

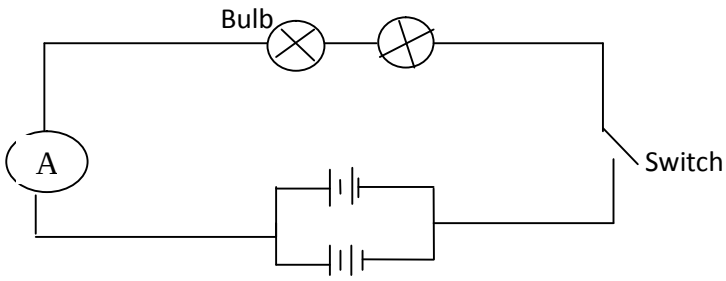


Fig2

8) The activity of a radioactivity source is initially 450 counts per second. After 72 hours, it reduces to 100 counts per second. If the background count per second is 50c/s, determine the half – life of the substance. (3mks)

9) Figure 3 shows a battery of e.m.f 3.0v connected in series will two capacitors.

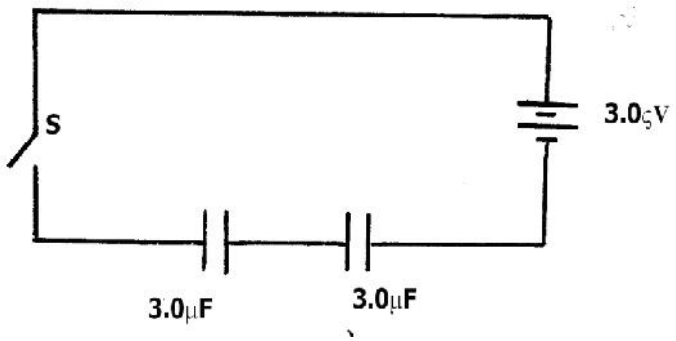


Figure 3

Determine the energy stored in the combined capacitors when the switch is closed. (3mks)

10) Figure 4 shows two bar magnets and a plotting compass.

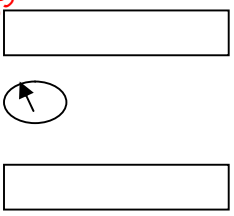


Fig.4

Draw the magnetic field round the bar magnet indicating the polarity of each. (1mk)

11) An appliance is rate 2.5KW, 240V a.c 50Hz. Explain the meaning of the rating(figures) on this appliance. (2mks)

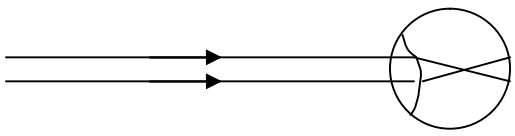
12) The following are electromagnetic waves. Arrange them according to their increasing frequency.
Gamma rays, microwaves, ultra-violet, TV waves and blue light. (1mk)

13) Distinguish between a transformer and induction coil. (2mks)

SECTION B (55 MARKS)

Answer all the questions from this section in the spaces provided.

14) a) The figure below shows rays of light entering a human eye which has a defect.

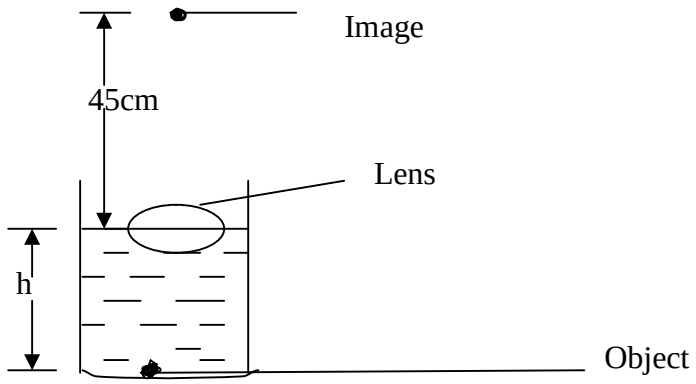


i) Name the defect. (1mk)

ii) State 2 possible causes of the defect. (1mk)

b) Define the accommodation. (1mk)

c) A small bright object O lies at the bottom of a beaker containing water of depth hcm. A convex lens of focal length 15cm is held at the surface of water. The lens forms an image of O at 45cm from the surface of water.

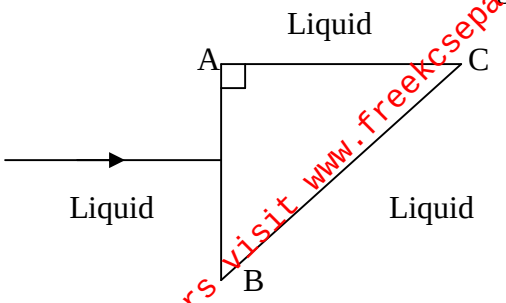


Taking the refractive index of water to be 4/3, determine:

(i) the apparent depth of the object (2mks)

(ii) the real depth h, of the object (2mks)

c. A ray of light is incident at right angles to the face AB, of a right angled isosceles prism of refractive index 1.6 as shown in the figure below.



If the prism is surrounded by a liquid of refractive index 1.40, determine:

(i) The angle of incidence on the face BC. (1mk)

(ii) The angle of refraction on the face BC. (3mks)

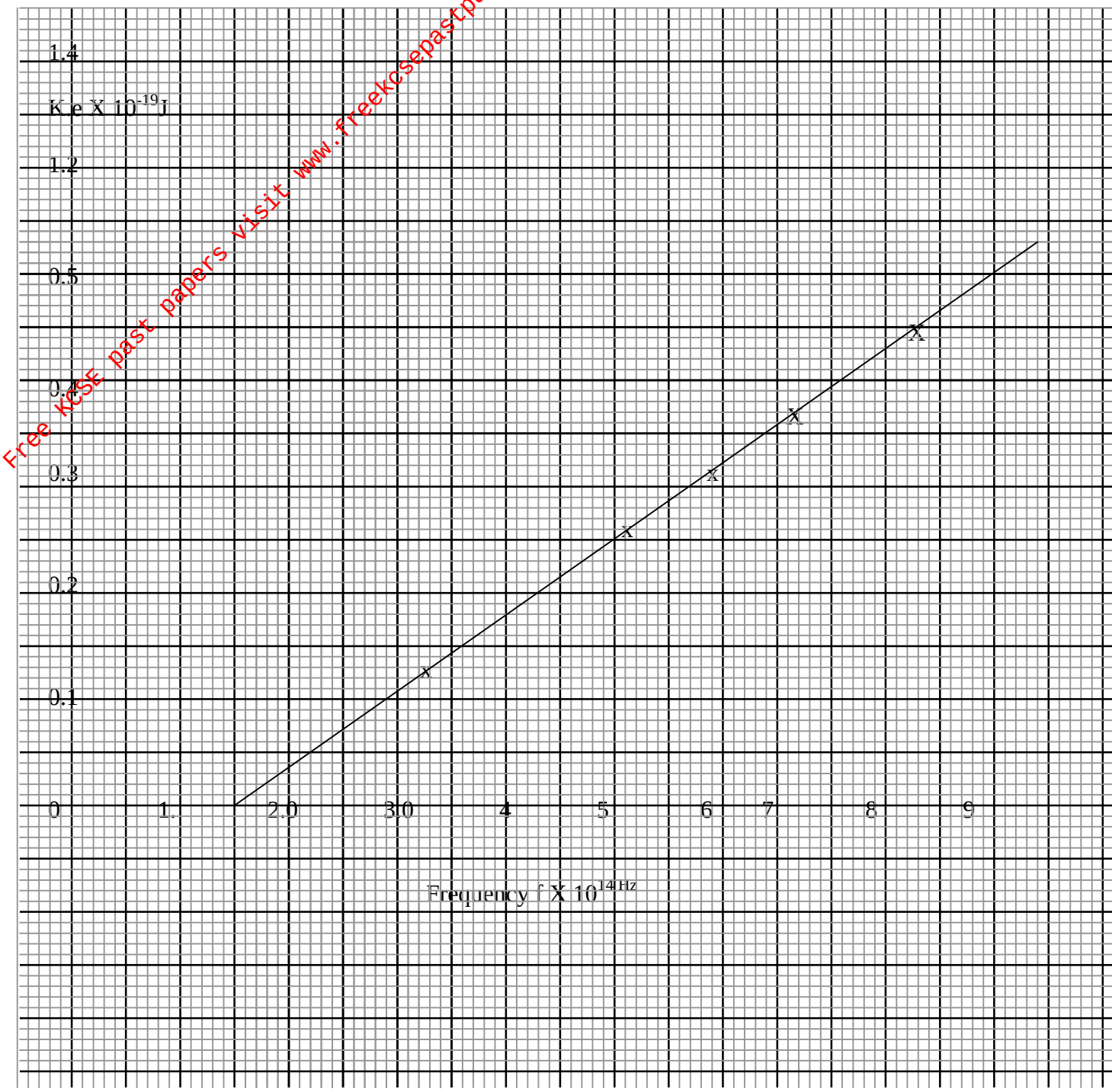
15) a) Define threshold wavelength as used in waves. (2mks)

b) The graph shows kinetic energy against frequency used to determine the Plank's constant h.

From the graph determine:

i) The slope. (3mks)

ii) The plank constant . (1mk)



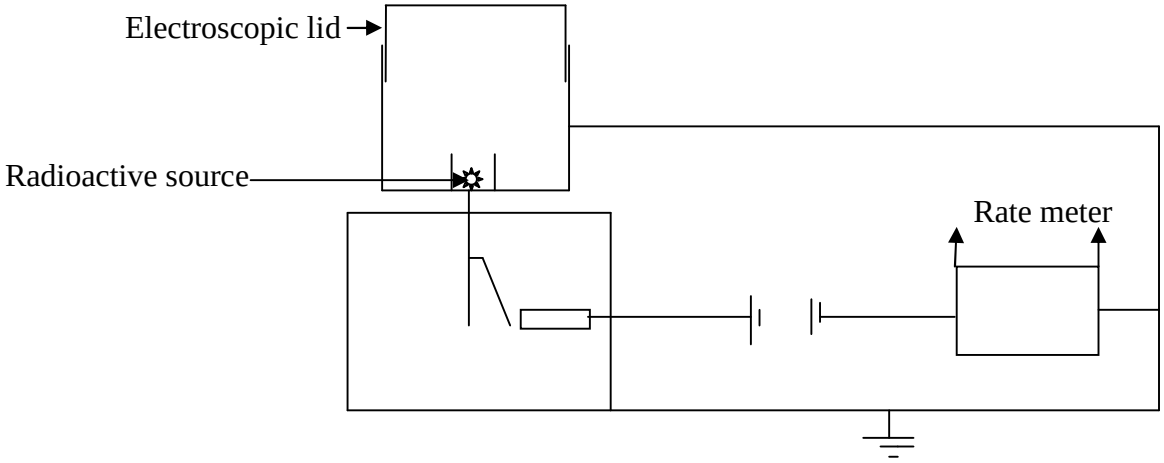
Iii) The threshold frequency. (1mk)

c) Explain how the intensity of radiation affects the photoelectric effects. (2mks)

d) Distinguish between a photon and a quantum. (2mks)

16) Define radioisotopes. (2mks)

b) The figure 7 shows a pulse electroscope that can be used to detect radioactivity. Explain how it works. (3mks)



c) A walking stick was found from an ancient dwelling. It was found that the stick has an activity of 13.5c/min. A living wood of the same species gives 216c/min. If the half-life of carbon 14 is 5600 years, find the age of the ancient dwelling. (3mks)

d) Distinguish between extrinsic and intrinsic semi-conductor. (2mks)

e) Sketch an electric circuit for a diode in a reverse bias. (2mks)

f) State one other use of a diode apart from rectification. (1mk)

17) a) The mains electricity is transmitted through high tension H.T. state the risk of this transmission. (2mks)

b) What is a fuse? (1mk)

c) State the three colour codes used in house circuit. (2mks)

i) Explain why the circuits in domestic wiring should be connected in parallel with the main supply. (1mks)

ii) Mrs. Ibin Batuta has two 2.5KW electric heater, 2.0KW electric stove, two 60W electric bulbs, 500W electric fan and 1.0Kw electric pressing box. Her power supply is 240V and main fuse 30A.

I) Can she connect all the appliances to her power supply at the same time? Explain. (2mks)

II) If the cost of electricity is Ksh.6.50 per unit, calculate the cost of using electric stove and electric pressing box for 3 hours a day in the month of June. (3mks)

18) a) Figure 9 is a signal displayed on the Y-plate of a C.R.O. If the sensitivity of the Y-gain is 200V/cm and the time base control is set at 40ms/cm.

Calculate:

i) The peak voltage of the signal. (2mks)

ii) The frequency of the signal. (3mks)

b) How would you increase the intensity of X-rays in an X-ray tube? (1mk)

c) An X-ray tube operates at cathode current of 40mA. Calculate the number of electrons striking the target metal per second. Take the charge of an electron as 1.6×10^{-19}C. (3mks)