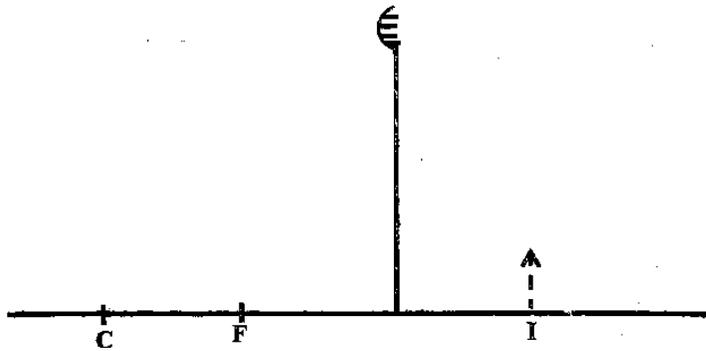


232/2  
 PHYSICS  
 PAPER 2 (THEORY)  
 JULY /AUGUST, 2009  
 TIME: 2 HRS

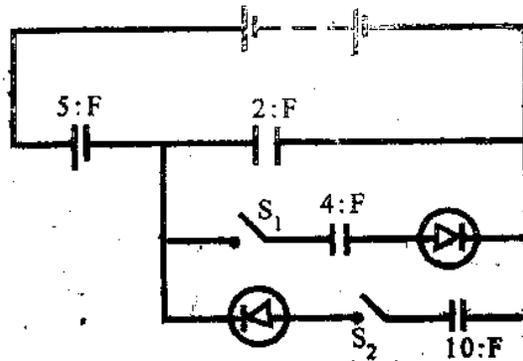
## NANDI EAST DISTRICT JOINT EVALUATION TEST 2009

### SECTION A: ( 25 MARKS)

- The figure shows an image of an object placed in front of a convex mirror of focal length 10cm. C is the centre of curvature, locate the position of the object (3 marks)

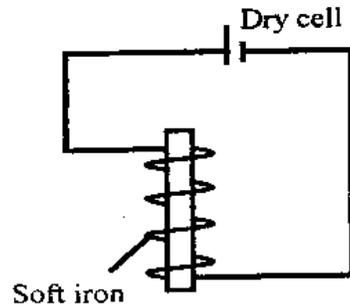


- Calculate the amount of current flowing through a wire when 0.6C of charge passes a point in the wire in 5 seconds. ( 2 marks)



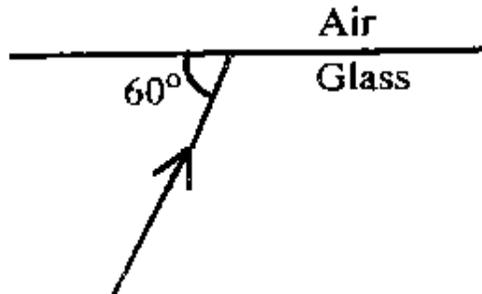
- In the circuit diagram above, determine the effective capacitance when both switches are closed ( 3 marks)

4. A student wanted to lift a magnetic piece of metal using an electromagnet. He connected the circuit shown below in order to make one but realized it could not lift the load



Suggest two adjustments he can make to his set up so that it can perform the intended function ( 2 marks)

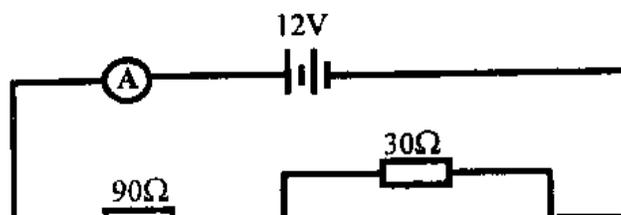
5. Figure below shows a ray of light passing from glass to air to an angle of  $60^\circ$  to the horizontal



If the refractive index of glass is 1.5, calculate the angle of refraction

6. An object is placed 20cm in front of a concave lens of focal length 15cm. State two characteristics of the image formed ( 2 marks)

7. In the circuit shown below the battery and ammeter have negligible internal resistance. Determine the p.d between point X and Y

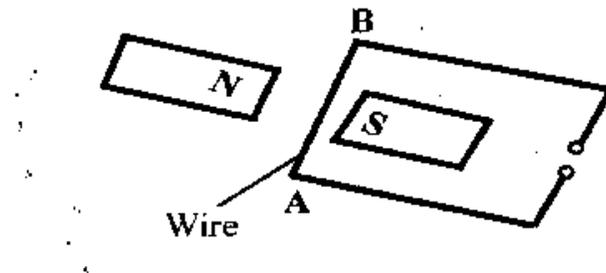


8. The table below shows incomplete regions of electromagnetic spectrum

Radio waves	A	I.R	Visible light	B	X- rays	R- rays
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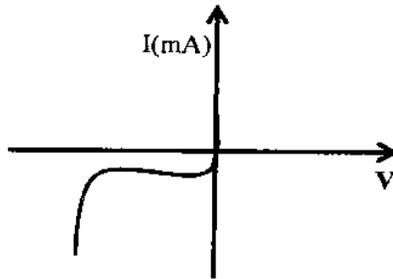
Identify A and B and state one application of B ( 3 marks)

9. The diagram below shows a wire A which has an e.m.f induced in it when it is moved downwards or upwards.



Indicate on the diagram the direction of induced e.m.f when the wire moves upwards ( 1 mark)

10.



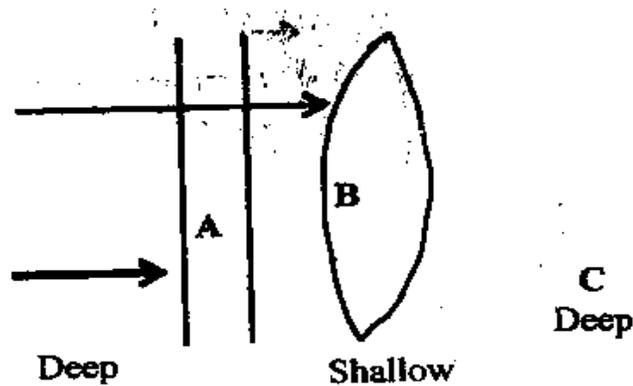
Show on the above diagram the zener voltage ( 1mark)

11. Explain how the grid in a cathode ray controls the brightness of the spot on the screen ( 2marks)

**SECTION B: (55 MARKS)**

12. (a) Differentiate between a stationary wave and progressive wave ( 2 marks)

(b) Figure 7 below shows plane in a ripple tank. The water is deeper in section A and C than B



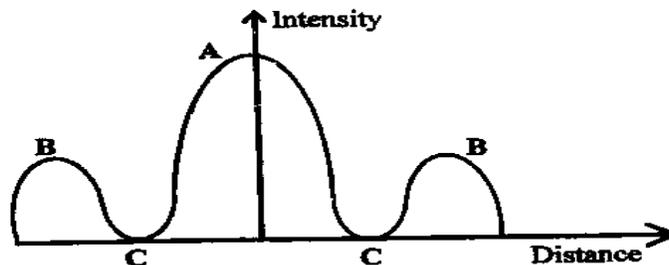
Draw the waves after passing section B ( 2 marks)

(c) A tube of length 36cm is closed at one end. It is resonance with a tuning fork of frequency 25Hz sounded above the open end. Given that the velocity of sound in air is 334m/s determine:

(i) The wavelength of the wave generated by the tuning fork ( 2 marks)

(ii) The end correction of the tube ( 2 marks)

(d) The sketch graph shows the results of an experiment to study diffraction patterns using double slit



(i) Sketch an experimental set - up that may be used to obtain such a pattern ( 2 marks)

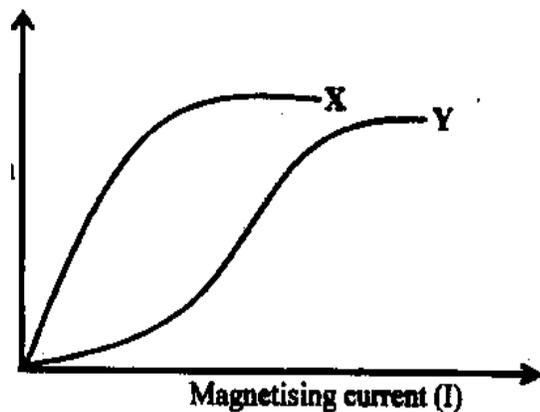
(ii) Explain how the peaks labeled A and B and troughs labeled C are formed ( 3 marks)

13. (a) You are provided with two similar substances one is magnetic material and the other is unmarked magnet. You are also provided with an inextensible string and a complete wooded retort stand.

(i) Using the above apparatus only, design an experiment that will enable you to distinguish between the magnet and the magnet material (3 marks)

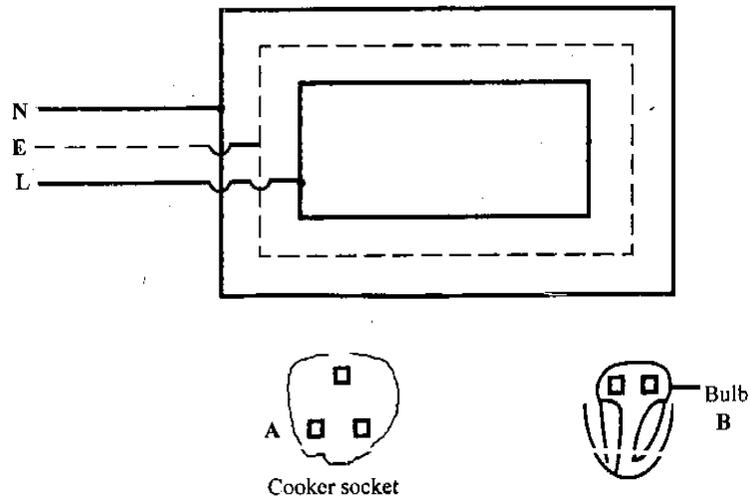
(ii) Give a reason why a wooded stand rather than a metallic stand is preferred (3 marks)

(b) In an experiment to magnetize two substances X and Y using electric currents, two graphs were obtained as shown in the figure below



Using the information in the above figure, explain the difference between the two substances using the domain theory (4 marks)

14. The diagram below shows an incomplete domestic wiring of a house with a cooker A and bulb B. Include a 13A and 5A fuse switches respectively in your set-up



- (a) Complete the diagram with extension lead wires to A and B from the ring mains ( 4 marks)

- (b) Calculate the power lost in a 120km cable, which has a resistance of  $2 \times 10^{-3} \Omega$  per meter in the transmission of 1000W though it at 40KV. ( 3 marks)

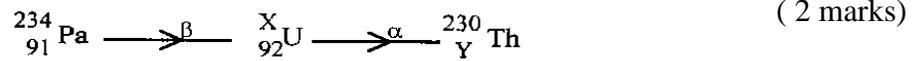
- (c) Give a reason why it is advantages to transmit electricity using high voltage low current compared to low voltage high current ( 1 mark)

15. (a) Define the following:

(i) Radioactivity ( 1 mark)

(ii) Isotope ( 1 mark)

(b) Complete the following nuclear reaction by identifying the values of X and Y



(c) Given that half-life of a radioactive isotope is 6 days, calculate the mass remaining unchanged of 8 g of the substance after 48 days (3 marks)

(d) Explain the function of the following in a diffusion cloud chamber

(i) Dry ice (1 mark)

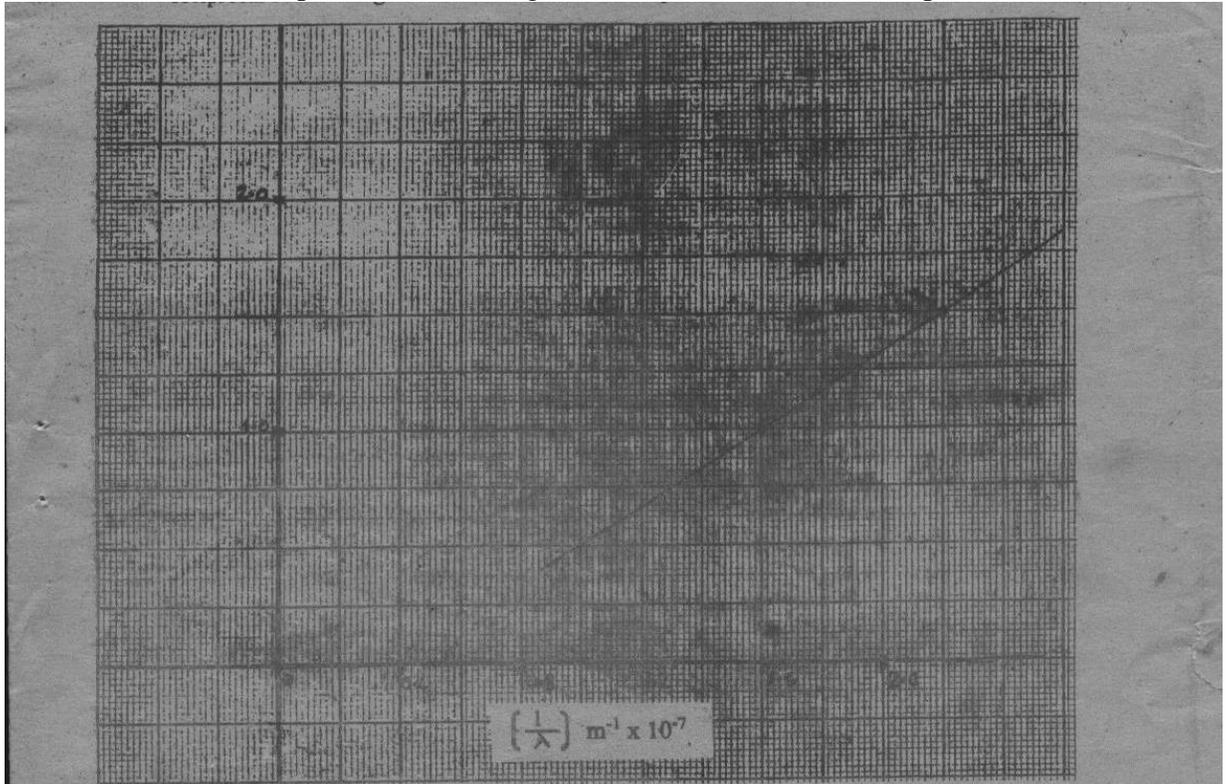
(ii) Light source (1 mark)

(e) (i) State two safety precautions that must be observed in handling and storing radioactive materials (2 marks)

(ii) Explain how radioactive isotope can be used to detect flaws (1 mark)

16. (a) state one factor that affects photoelectric emission (1 mark)

(b) The graph in figure shows the relationship between anode – cathode potential difference and the reciprocal of wavelength of radiations incident to a photocell



(i) Draw a circuit diagram that may be used to obtain this relationship ( 2 marks)

(iii) From the graph determine:

I The value of Planck's constant ( 3 marks)

II The threshold frequency ( 2 marks)

III The minimum energy needed to cause photoelectric emission ( 2 marks)

(c) In an X- Ray tube, an electron strikes the target with a speed of  $5.6 \times 10^7 \text{ m/s}$ . calculate the accelerating voltage used in the X- ray tube. ( 3 marks)

(d) Give two applications of photoelectric effect ( 2 marks)