

FORM FOUR TERM ONE EXAM 2017

PHYSICS PAPER 2
TIME: 2 HOURS

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This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

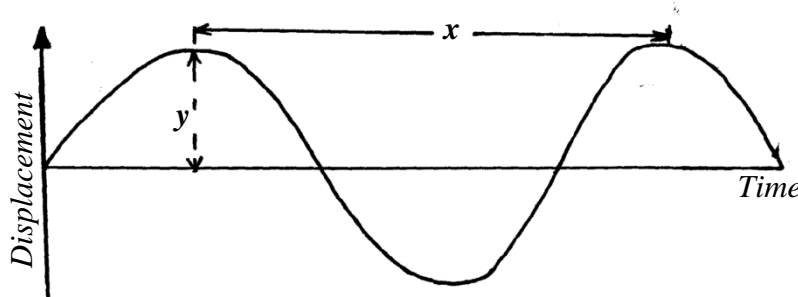
SECTION A (25MKS)

Answer all questions in this section

1. A white paper is a good reflector of light but does not form image like a mirror. Explain this observation (1mk)

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2. The diagram below shows a wave motion



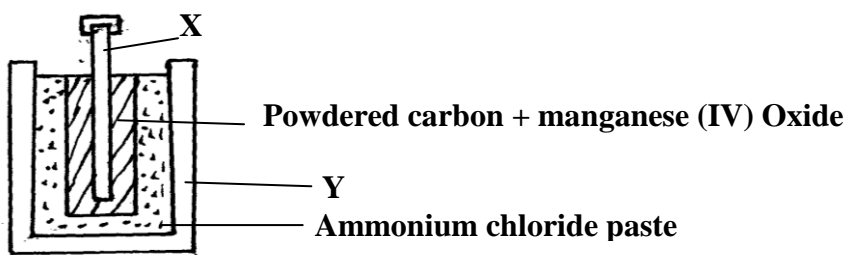
- (a) What does **Y** represent..... (1mk)

- (b) What does **X** represent..... (1mk)

3. State **two** conditions necessary for sound production (2mks)

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4. The figure below shows a dry cell;



- (a) Name **X** and **Y** (2mks)

X.....

Y.....

- (b) What is the function of **X** and **Y** (2mks)

X.....

Y.....

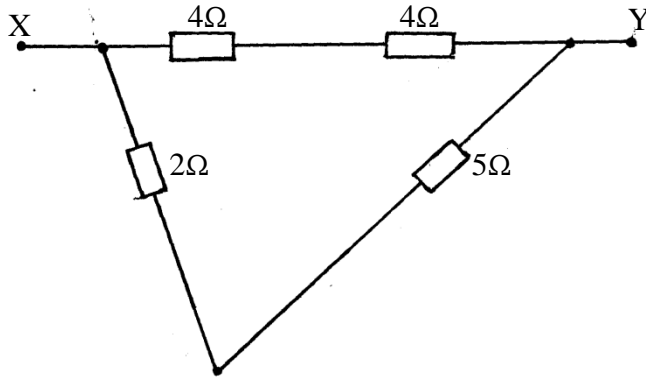
5. How would you identify the polarity of a magnet whose poles are not marked (2mks)

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6. A soldier standing 100m from a wall blows a whistle and hears its echo sometime later. If the speed

of sound in air is 330m/s. How long does it take the soldier to hear the echo of the whistle? (3mks)

7. Determine the effective resistance between points X and Y in the figure shown below (3mks)



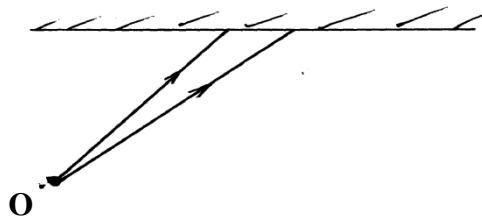
8. Sketch a diagram showing how you can use a 45° , 45° , 90° prisms turn a beam of light through an angle of 90° (2mks)

9. Explain why you might see **AMBULANCE** painted on the front of an ambulance (2mks)

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10. Figure below shows two rays of light leaving an object O and striking a plane mirror. Draw two reflected rays and use them to find the position of the image (2mks)



11. Draw a ray diagrams to illustrated the meaning of (i) critical angle (ii) total internal reflection(2mks)

SECTION II (55 MARKS)

Answer all questions in this section

12. Radio transmission is possible with a certain spectrum of waves that travel through space at $3 \times 10^8 \text{ m/s}$.
 (a) Draw a diagram of the complete electromagnetic spectrum labeling the various types of radiation (3mks)

(b) State **two** differences between radio waves and the other types of radiation in the electromagnetic spectrum (1mk)

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(c) What is the importance of the ionosphere in radio wave propagation (2mks)

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(d) What is the frequency of the radio transmission on wavelength 1500m? (3mks)

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(e) State **three** properties common to all the electromagnetic waves (3mks)

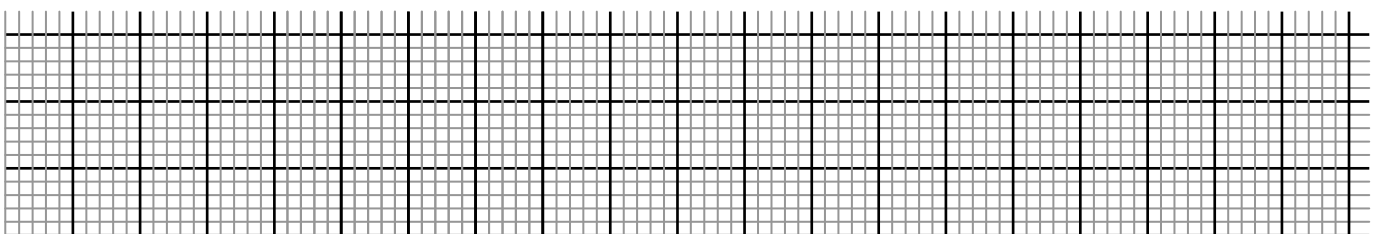
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13. The table below shows the object distance **u** and the corresponding image distance **v**, for an object placed in front of a concave mirror

U(cm)	20	25	30	40	50	70
V(cm)	20	16.7	15	13.3	12.5	11.6

(i) Tabulate a suitable table below (3mks)

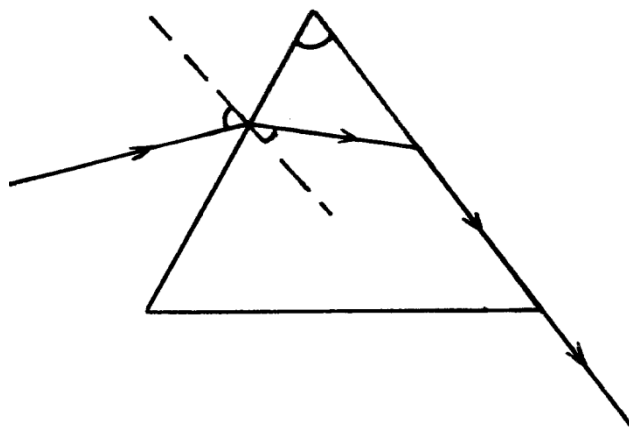
(ii) Plot a suitable graph using your table (5mks)



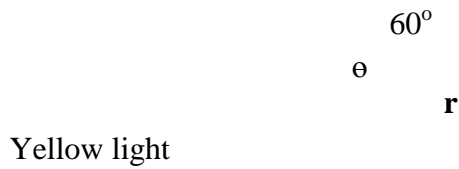
(a) From the graph, determine the focal length of the mirror

(3mks)

14. Figure below shows the path of a ray of yellow light through a glass prism. The speed of yellow light in the prism is $1.88 \times 10^8 \text{ m/s}$



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(a) Determine the refractive index of the prism material for the light.
(speed of light in vacuum $C=3 \times 10^8 \text{ms}^{-1}$) (3mks)

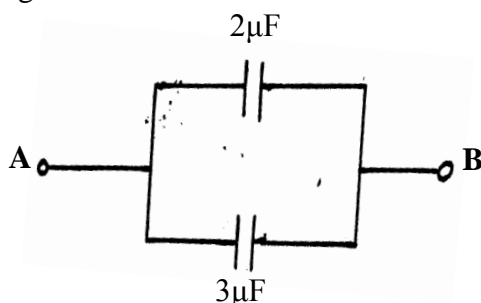
(b) Show on the figure the critical angle **C**, and determine its value (3mks)

(c) Given that $r=21.2^\circ$, determine angle θ (3mks)

(d) On the same figure sketch the path of the light after striking the prism if the prism was replaced by another of similar shape but lower refractive index (2mks)

15. (a) An immersion heater rated 90W is placed in a liquid of mass 2kg. When the heater is switched on for 15 minutes, the temperature of the liquid rises from 20°C to 30°C . Determine the specific heat capacity of the liquid (3mks)

(b) The figure below shows a circuit containing two capacitors of $2\mu\text{F}$ and $3\mu\text{F}$ respectively



Determine the p.d across **AB** given that the total charge in the capacitors is 1×10^{-4} coulombs (3mks)

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(c) The audible frequency for a certain person is 30Hz to 16500Hz. Determine the largest wavelength of sound in air the person can detect. (*speed of sound in air=330m/s*) (3mks)

(d) A polythene rod may be charged negatively by rubbing it with a cloth, but a brass rod held in the hand cannot be charged in this way.

(i) State clearly what happens when the polythene rod is being charged (2mks)

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(ii) Explain why the brass rod cannot be charged by rubbing this way. (1mk)

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16. (a) Draw a well labeled diagram of an annular eclipse. (3mks)

(b) State two differences between an image formed by a pinhole camera and an image formed by a lens camera. (2mks)

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(c) An object is placed 15cm from a concave mirror of focal length 6cm. Find the position, magnification and nature of the image formed.

(4mks)

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