

Name:..... Index No.
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232/2

PHYSICS

PAPER 2

JULY /AUGUST 2012

TIME: 2 HOURS

JOINT INTER-SCHOOL EVALUATION TEST (JISSET)
Kenya Certificate of Secondary Education (K.C.S.E.) 2012

232/2

PHYSICS

PAPER 2

JULY /AUGUST 2012

INSTRUCTIONS TO THE CANDIDATES:

- ❖ Write your **name** and **index number** in the spaces provided above
- ❖ This paper consists of *two* sections **A** and **B**.
- ❖ Answer *all* questions in section **A** and **B** in the spaces provided.
- ❖ All working *must* be clearly shown in the spaces provided.
- ❖ Mathematical tables and electronic calculators may be used.
- ❖ Take $h = 6.64 \times 10^{-34}$ Js
- ❖ $M_e = 9.1 \times 10^{-31}$ Kg,

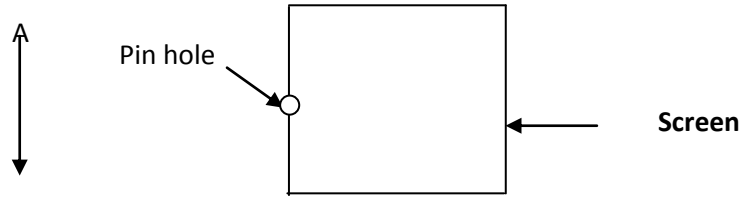
For Examiners' Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-16	25	
B	17	12	
	18	10	
	19	14	
	20	12	
	21	7	
	TOTAL	80	

SECTION A (25 marks)

Answer all questions in this section in the spaces provided

1. Figure 1 shows an object AB placed in front of a pin-hole camera. Using a ray diagram, show how the image is formed on the screen.



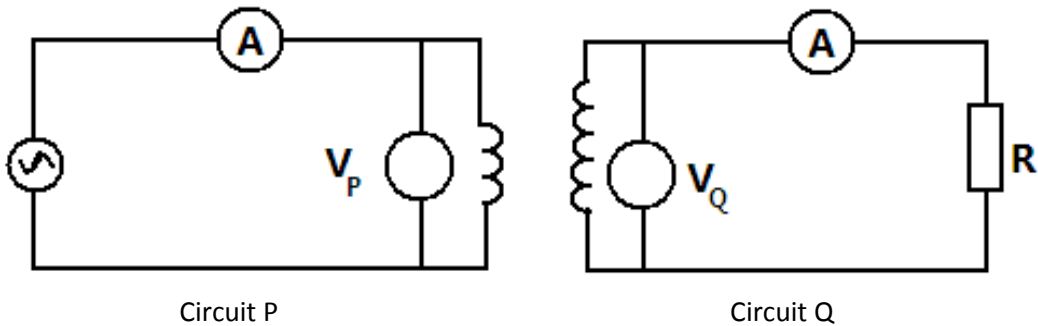
2. **State** the conditions necessary for a wave incident on a slit to be diffracted. (2mrks)

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3. Figure 2 represents a transformer connected to an Ac source and a resistor R.



Circuit P

Circuit Q

- a). Compare the ratios $\frac{I_P}{I_Q}$ and $\frac{V_Q}{V_P}$ where I_P and I_Q are the currents flowing through the circuits P and Q respectively while V_P and V_Q are the potential differences across the circuits P and Q respectively.

(1mrk)

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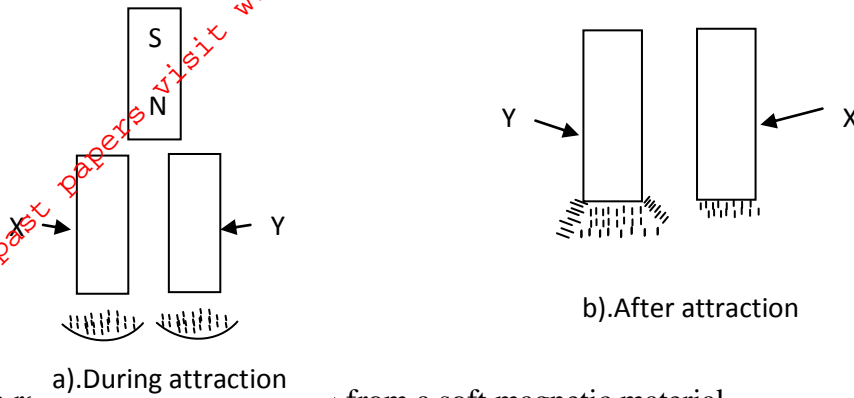
- b) **State** the assumption made in question 3 (a) above. (1mrk)

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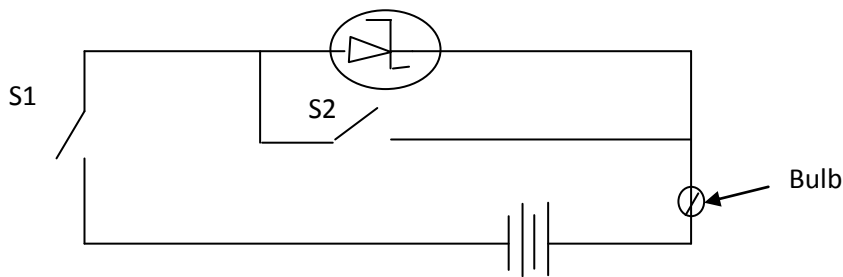
4. Figure 3 below shows a simple experiment using a permanent magnet and two metal bars X and Y put closer the iron filings.



State with a reason why bar X attracts more iron filings than bar Y. (2mrks)

5. **State one** difference between a chemical reaction and radioactivity. (1mrk)

6. Figure 4 shows a Zener diode connected in a circuit in series with a bulb.



It is observed that the bulb lights when both switches S_1 and S_2 are closed. **State and explain** the observation made on the bulb when S_1 is closed and S_2 is open. (2mrks)

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7. **State** the advantage of generating an Ac supply rather than DC voltage supply in a power station. (1mrk)

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8. Figure 5 shows a force on a conductor carrying current when placed in a magnetic field.

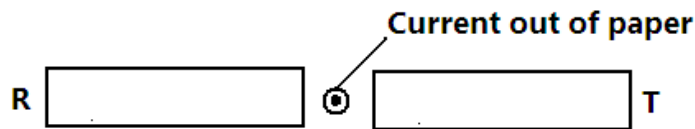


Figure 5

State the polarities R and T. (1mrk)

T _____

R _____

9. What is the purpose of a fuse in domestic wiring system? (1mrk)

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10. The period of a wave is T seconds. Its wavelength is λ metres. Show that $v = f\lambda$ where v is the speed of the wave and f is the frequency. (2mrks)

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11. In determining the depth of an ocean, an echo sounder producing ultrasonic sound is used. **Give one** reason why this sound is preferred. (1mrk)

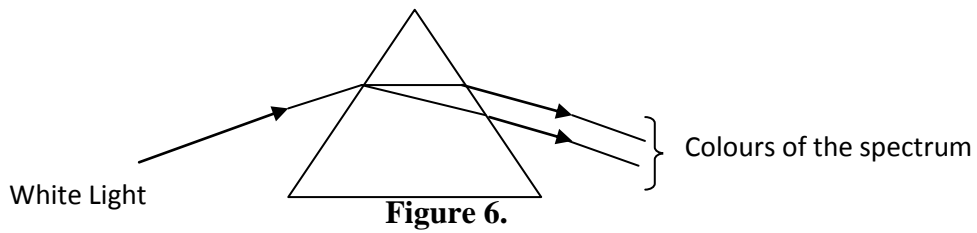
12. What causes electrical resistance in conductors? (1mrk)

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13. *State one* advantage of a CRO as a voltmeter over other voltmeters. (1mrk)

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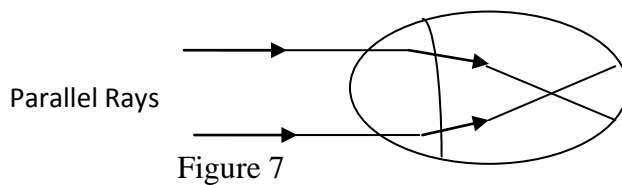
14. A ray of light incident on the surface of a glass prism is observed as represented in the



Explain this observation. (2mrks)

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15. Figure 7 shows how a distant object is focused in defective eye.



a). *State* the nature of effect. (1mrk)

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b). Suggest a suitable lens to correct the defect. (1mrk)

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16. One of the isotopes of Uranium has a half life of 576 hours.

- a) Complete the table below to show how the mass varies with time from the initial mass of 4000mg.

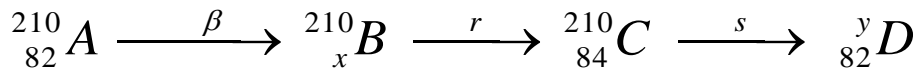
Time (minutes)	34560	69120
Mass (mg)	4000	

- b) Explain why the mass of the isotope will not eventually reduce to zero. (1mrk)
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SECTION B (55Marks)

Answer ALL the questions in this section in the spaces provided

17. a).The following nuclear reaction is part of radioactive series.



- i). Name the radiations represented by r and s (2mrks)

s _____
r _____

- ii). Determine the numbers represented by x and y. (2mrks)

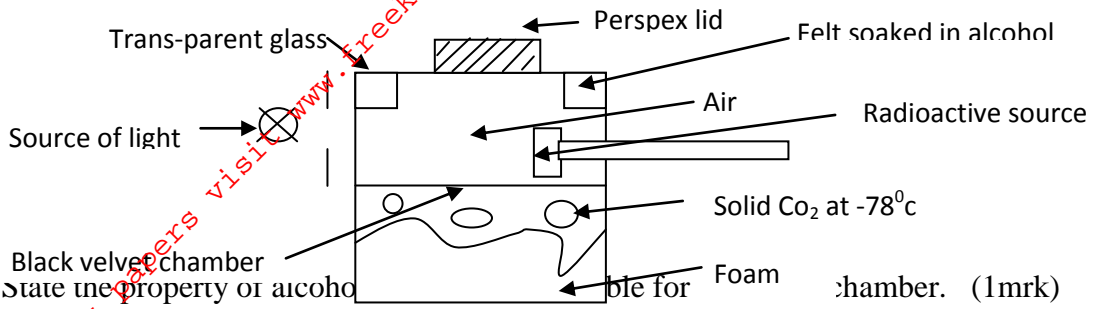
y

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x

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b) Figure 8 shows the features of a diffusion cloud chamber used for detecting radiations for radioactive sources.



i) State the property of alcohol in the cloud chamber. (1mrk)

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ii) *State* the function of the Perspex lid. (1mrk)

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iii) *Explain* why the base velvet chamber is painted black. (1mrk)

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iv) Explain how the radiation from the radioactive source is detected in chamber. (4mrks)

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v) *State two* advantages of the cloud chamber over a charged gold leaf electroscope when used as detectors of radiations. (2mrks)

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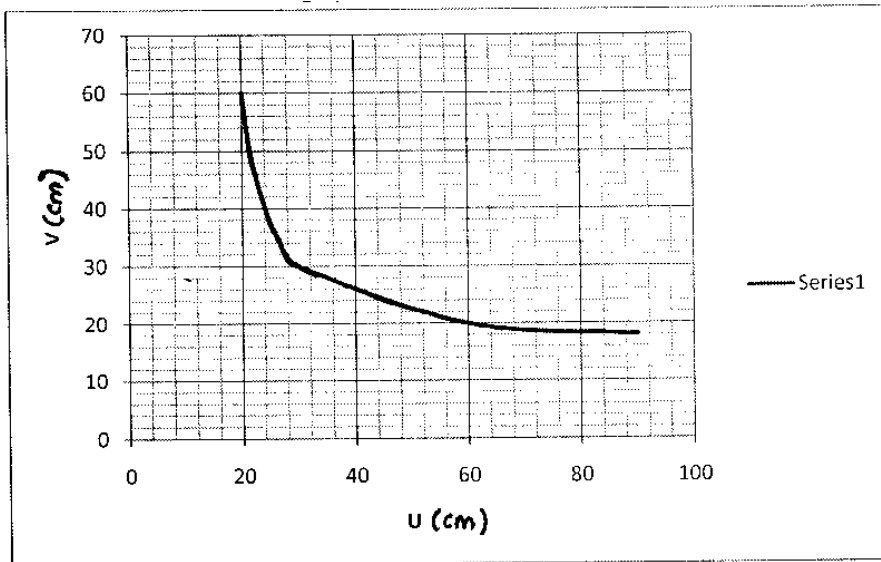
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18. a). Figure 8 shows an object AB, placed in front of a converging mirror. C is the center of curvature of the mirror.



Using a ray diagram, determine the size of the image of AB as reflected by the mirror. (4mrks)

b). In an experiment to determine the focal length of a convex lens, the corresponding values of the object distance u , and the image distance v , both measured from the optical center of the lens were obtained. The graph below shows the relationship between v and u .



i) Using the graph above and without using the lens formula, determine the value of the focal length of the lens. (3mrks)

ii) A convex mirror of focal length 10cm forms an image 5cm from the mirror. By calculations, determine the position of the object as measured from the mirror. (3mrks)

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19. a) State Ohm's law. (1mrk)

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b). A dry cell of emf E and an internal resistance of r is used to drive a current through various resistors of resistance R and the values of $\frac{1}{I}$ and R plotted on a graph in figure 9.

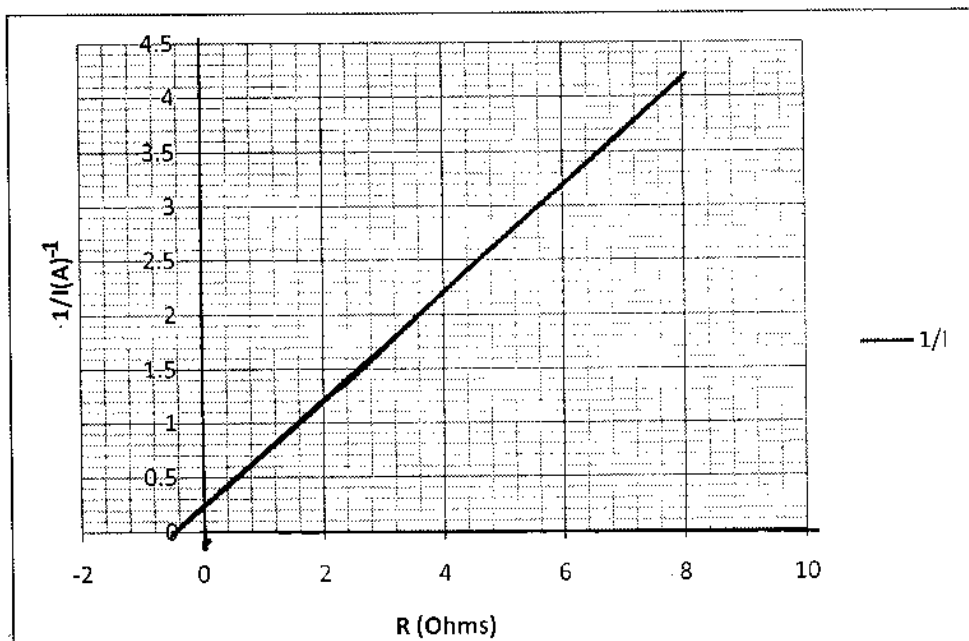


Figure 9.

The variables I and R are related by the equation $\frac{1}{I} = \frac{R}{E} + \frac{r}{E}$

(i) Using the graph in figure 9, determine the emf, E of the cell. (4mrks)

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iii) Show that the internal resistance r of the cell is given by $r = -R$ intercept and hence determine r .
(3mrks)

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c). Figure 10 shows part of a ring main circuit connected to hair drier salon heater.

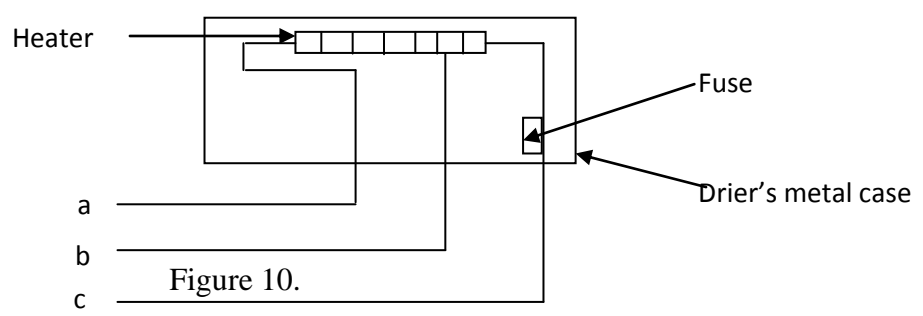


Figure 10.

Identify by giving a reason the wire labeled c. (2mrks)

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d). Two lamps marked 75W 250V and an electric heater marked 2KW 250V are used for a period of 10 hours. Calculate the total cost of using them for this period if electricity costs Khs.4.5 per kWh unit.
(4mrks)

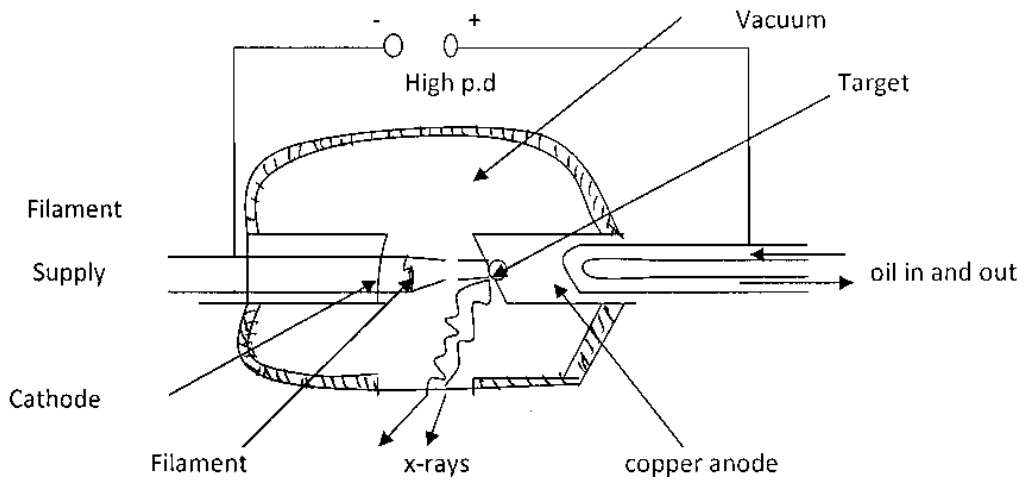
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20. a) State one property of X – rays that is not exhibited by visible light. (1mrk)

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b) Figure 11 shows the features of an X- ray tube.



i). State how the electrons are produced. (1mrk)

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ii). What is the effect on the wavelength of the X- rays produced when

a) P.d across the tube is decreased. (1mrk)

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b) The number of electrons hitting the metal target is increased. (1mrk)

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iii). Why is copper metal used at the anode? (1mrk)

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iv). **State** with a reason the property of molybdenum that makes it suitable as a target. (2mrks)

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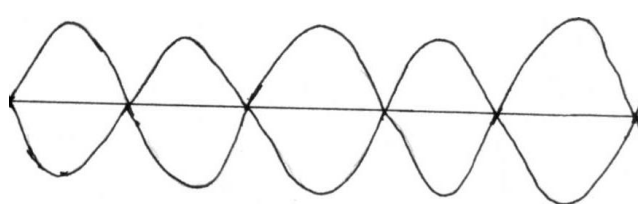
v). Explain how soft X – rays are produced in this X – ray tube. (2mrks)

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c). Calculate the maximum velocity of electrons that would produce X- rays of frequency 8.0×10^8 Hz if only 20% of the kinetic energy is converted to X rays. (3mrks)

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21.a) Figure 12 shows a transverse stationary wave along a string



i). Label the nodes and antinodes on the diagram above. (1mrk)

ii). If the distance between an anti-node and consecutive node is 1.0×10^{-3} m, determine the wavelength of the stationary wave. (2mrks)

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b). Five successive wave frequency in a ripple tank are observed to spread a distance of 6.4cm. If the vibrator has a frequency of 8 Hz, determine the speed of the wave. (2mrks)

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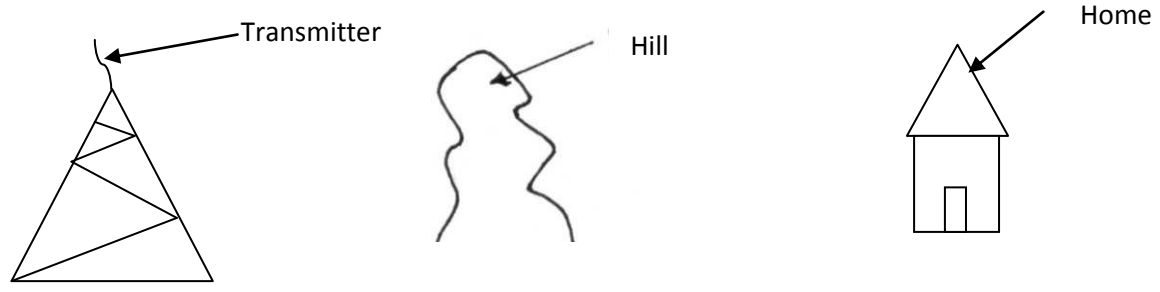
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d). Figure 13 shows a transmitter producing both TV and radio waves.



Briefly explain why radio reception will be better than TV beyond the hill. (2mrks)

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