

MANGU MOCK TRIAL 3

PHYSICS

232/2

PAPER 2 (THEORY)

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

Kenya Certificate of Secondary Education.

INSTRUCTIONS

- Write your name and your Index number in the spaces provided.
- This paper consists of **two** sections, Section A and B. Answer **ALL** the questions in both section in the spaces provided in this paper.
- ALL** working must be clearly shown.
- Mathematical tables and electronic calculators **may be** used.

FOR EXAMINERS' USE ONLY.

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATES SCORE
A	1 - 12	25	
B	13	13	
	14	12	
	15	09	
	16	09	
	17	12	
		80	

SECTION A (25MARKS)

Answer all the questions in this section

1. Figure (1) below shows two rays of light from an object reflected on a plane mirror

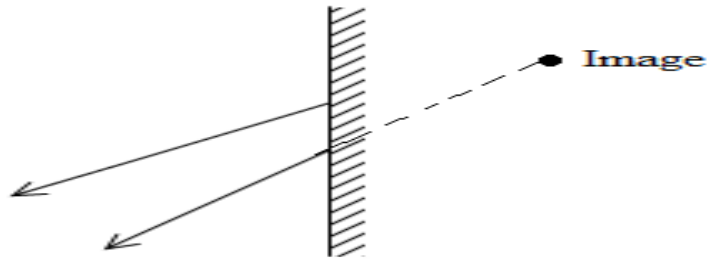


Fig 1.

Using proper ray construction, show the object position (2marks)

2. The fig 2 below shows a ray of light incident on a glass prism

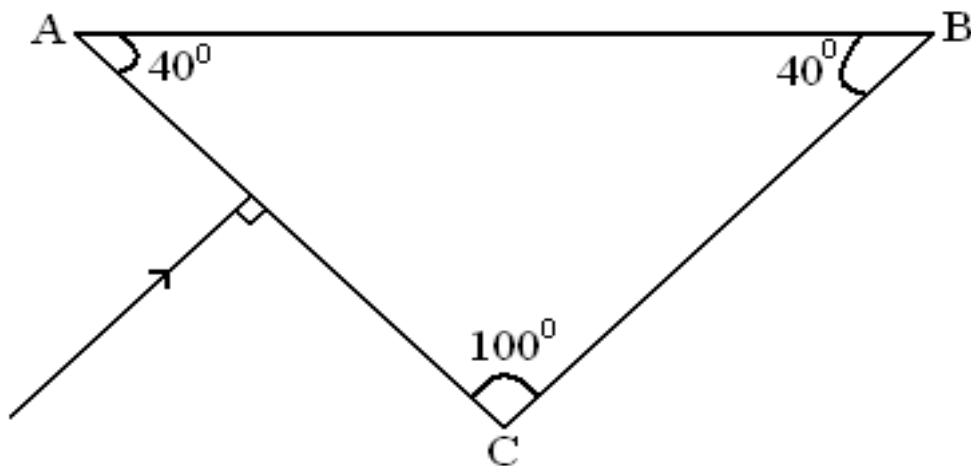


Fig2

Given that the critical angle for the grass is 39° , **sketch** on the diagram the path of the ray through the prism. (2 marks)

3. The diagram on figure 3 shows the National Grid system.

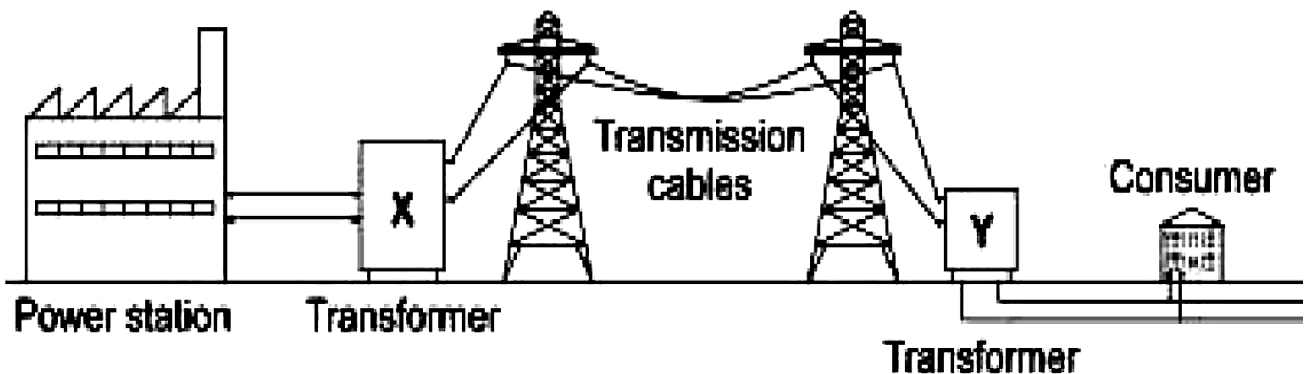


Fig3.

(a) What type of transformer is;

X..... (1mark)

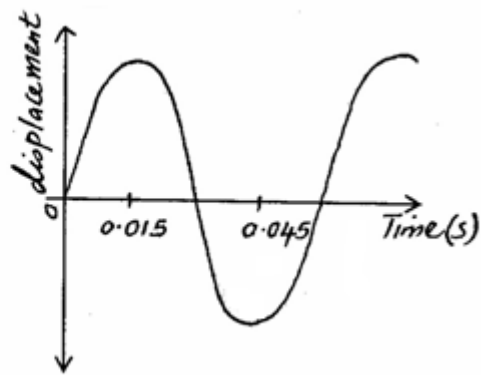
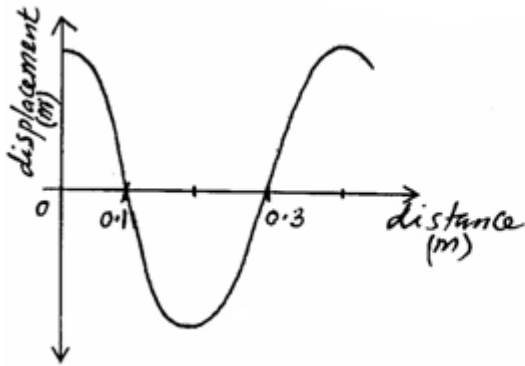
Y..... (1mark)

4. State **one** advantages of using circuit breakers in the consumer unit than using fuse wire.

(1marks)

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5. The figures **below** shows two waveforms representing the same wave motion.



Determine the velocity of the wave.

(3mks)

6. Figure 4. Below shows a 6V battery connected to an arrangement of resistors. Determine the current flowing through the 2Ω resistor. (3marks)

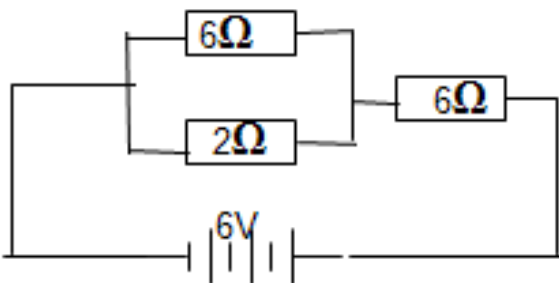


Fig 6.

7. The figure 7 below shows the electromagnetic spectrum.

Radio waves	Infra-red	AA	ultraviolet	B B	Gamma rays
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(a) Identify A

(1 mark)

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(b) State one industrial use of B

(1 mark)

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8. The diagram (Fig 8) shows a positively charged acetate strip and a negatively charged polythene strip that are freely suspended.

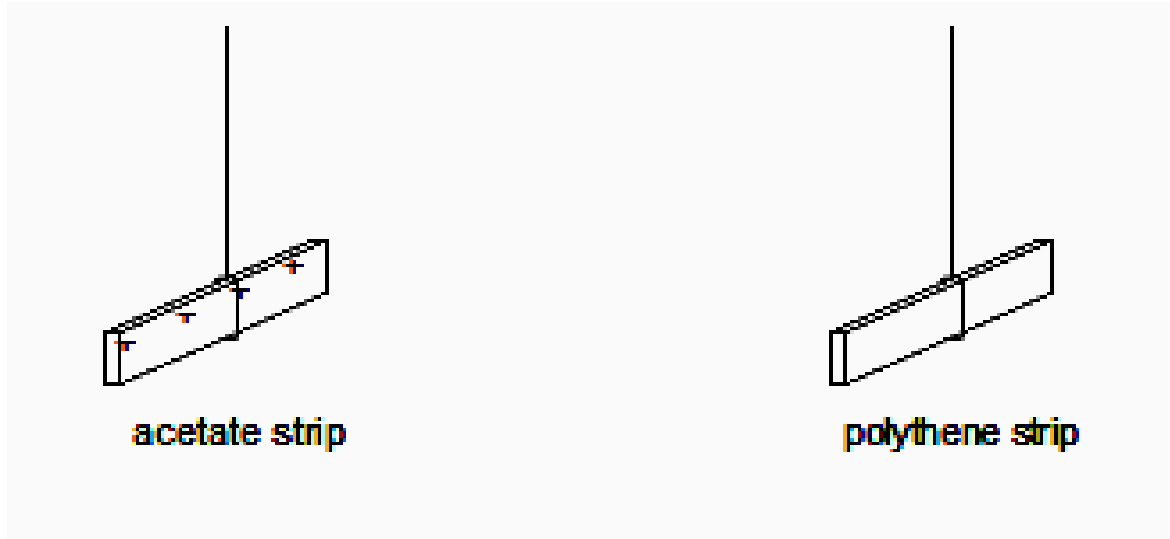


Fig8.

Two rods X and Y are brought up in turn to these two strips. Rod X attracts the acetate strip but repels the polythene strip. Rod Y does not repel either the acetate strip or the polythene strip.

State the type of charge is on each rod.

(2mks)

X.....

Y.....

9. State two advantages of an alkaline accumulator over lead acid accumulator. (2mks)

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10. Figure 9 below show a **concave** lens and object.

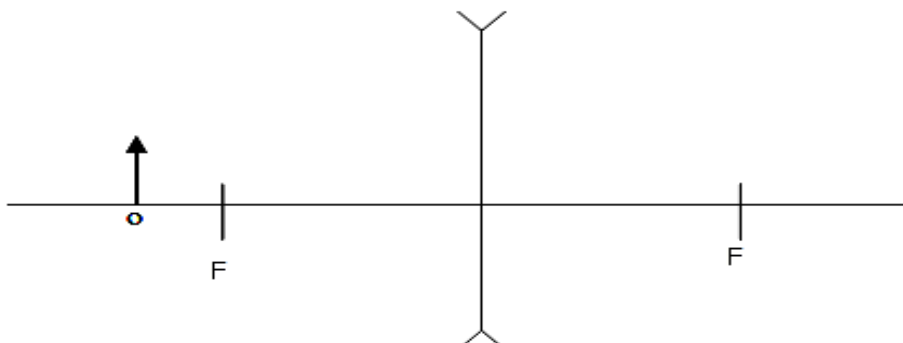


Fig 9.

Sketch the rays to show the image formed.

(2marks)

11. Two similar razor blades were placed on a wooden block and the other on an iron block as in **figure 10**.

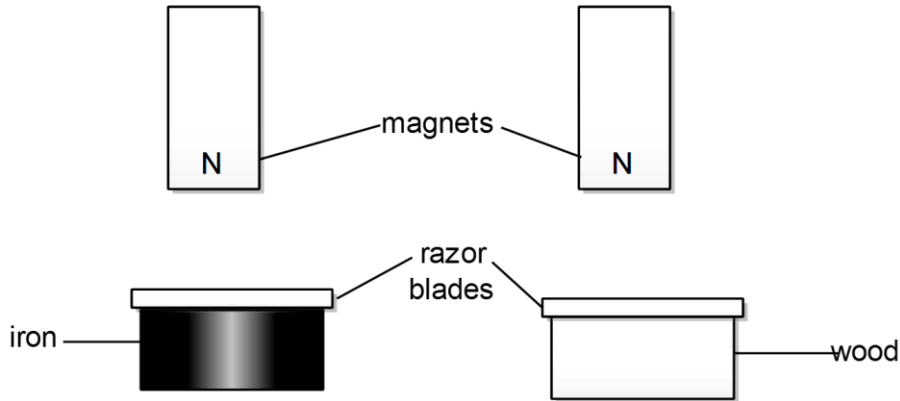


Fig 10.

It was observed that the razor blade on the wooden block is attracted by the magnet while that on the iron block was not. Explain. (2 marks)

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12. The **figure 11** below shows water waves about to pass through a gap. One wave front is shown after it has passed through the gap.

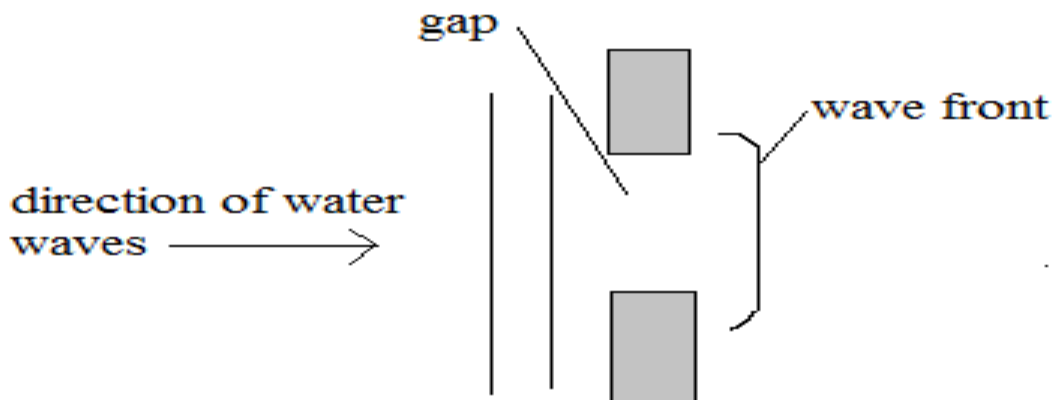


Fig 11

(i) On the diagram, draw two more wave fronts that have passed through the gap. (1mark)

(ii) State two changes which would each make the wave fronts become more curved after passing through the gap. (1 mark)

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SECTION B (55MARKS)

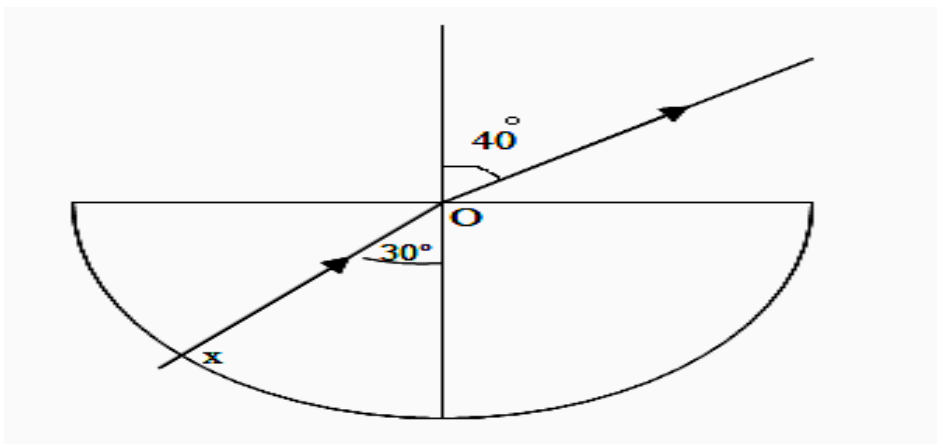
Answer All The Questions In This Section.

13.(a) State what is meant by refractive index of a material. (1 mark)

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(b) Figure 12 represents a ray of light falling normally on the curved surface of a semi-circular plastic block at X, meeting the opposite face at an angle of incidence of 30° and emerging into the air at an angle of 40° .

Fig 12



(i) State and explain what happens to the ray as it moves from:

I) Air to glass at X. (1marks)

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II) From glass to air at O. (1marks)

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(ii) Calculate refractive index of the plastic. **(3marks)**

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(iii) State the conditions to be satisfied for total internal reflection to occur. **(2marks)**

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(iv) Describe how the apparatus above could be used to find the critical angle experimentally. **(3marks)**

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(v) Calculate the critical angle for this plastic. **(2marks)**

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14. (a) State what is meant by the term capacitance. **(1marks)**

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(b) Distinguish between a paper capacitor and an electrolyte capacitor. (1marks)

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

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(d) Figure 10 below shows a network of capacitors in series.

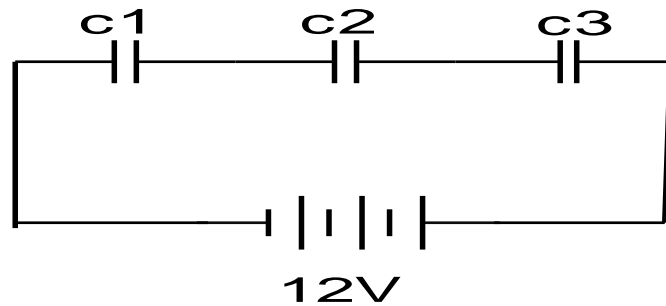


Fig 10.

(i) Derive an expression for their effective capacitance C_E from first principles. (3marks)

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(ii) Given that $C_1=10.5\mu\text{F}$, $C_2 =2\mu\text{F}$ and $C_3= 3\mu\text{F}$.

Calculate effective capacitance C_E in (2) above and hence

Determine the charge stored on each capacitor.

(3marks)

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(e) State two applications of capacitors.

(2marks)

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15.(a) Use the **figure 11** below to answer the questions that follows.

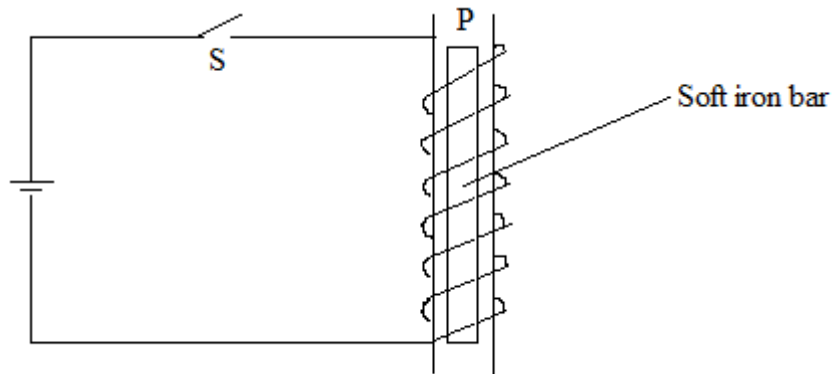


Fig.11

(i) Show the direction of the current on the turns when the switch S is closed. (1marks)

(ii) State the polarity at P (1marks)

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(iii) Explain using domain theory what happens on the soft iron bar. (1marks)

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(iv). If steel bar was used instead, what could be the difference? (2marks)

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(b) The following diagram (**figure 12**), shows a part of an electric d.c motor.

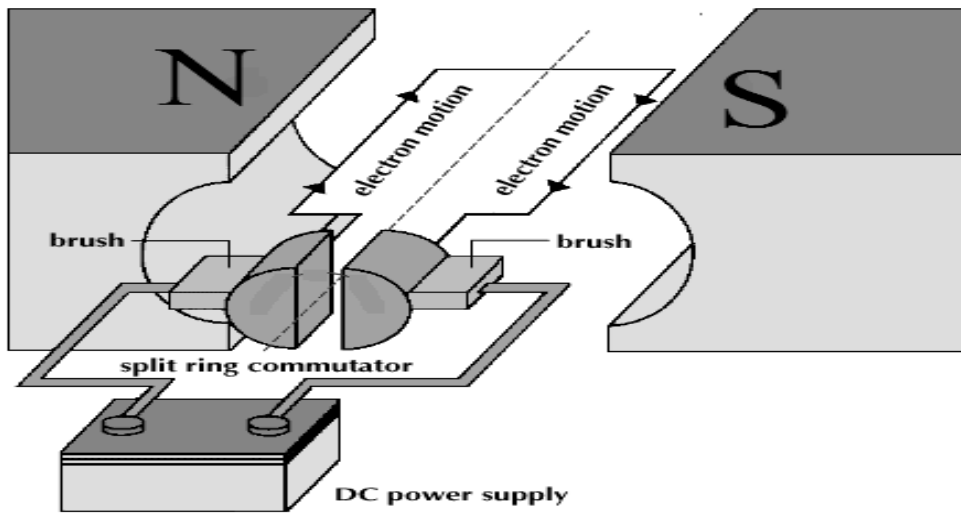


Fig 12.

- (i) On the diagram above show the direction of rotation of the coil. **(1marks)**
- (ii) State the effect of increasing the number of turns of the rotating coil of an electric motor. **(1marks)**

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(c) Sketch the magnetic field pattern around the conductor carrying current on figures 13 and 14 shown below. **(2marks)**

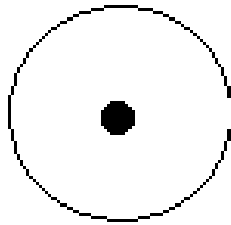
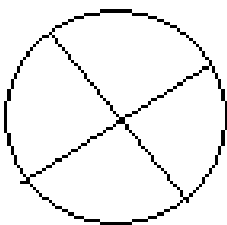


Fig 13.

Fig 14

16(a) Distinguish between real image and a virtual image. **(2mks)**

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(b) The distance between an object and its upright image produced by a curved mirror is 40cm. the image is 3 times as tall as the object

(i) State the type of mirror used. (1mk)

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(ii) Determine the object distance (2mks)

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(iii) Determine the radius of curvature of the mirror (3 mks)

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(iv) State one application of the mirror as used in (b) above (1mk)

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17(a) State Ohm's Law. (1mk)

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(b) Explain why a 12V car battery is able to start the motor car engine while eight dry cells of 1.5 v each connected in series will not. (2mks)

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(c) In figure 15 the current in the circuit is 1.80A

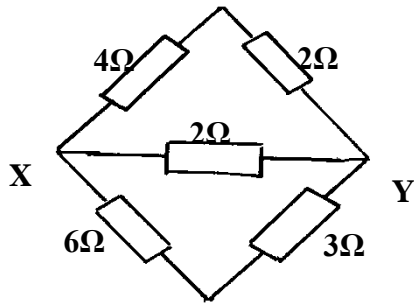


Fig 15

(i) Find the effective resistance between X and Y.

(3mks)

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(ii) The p.d of the source.

(2mks)

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(iii) Current through the 3Ω resistor

(2mks)

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(iv) Give two differences between a primary and a secondary cell

(2mks)

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