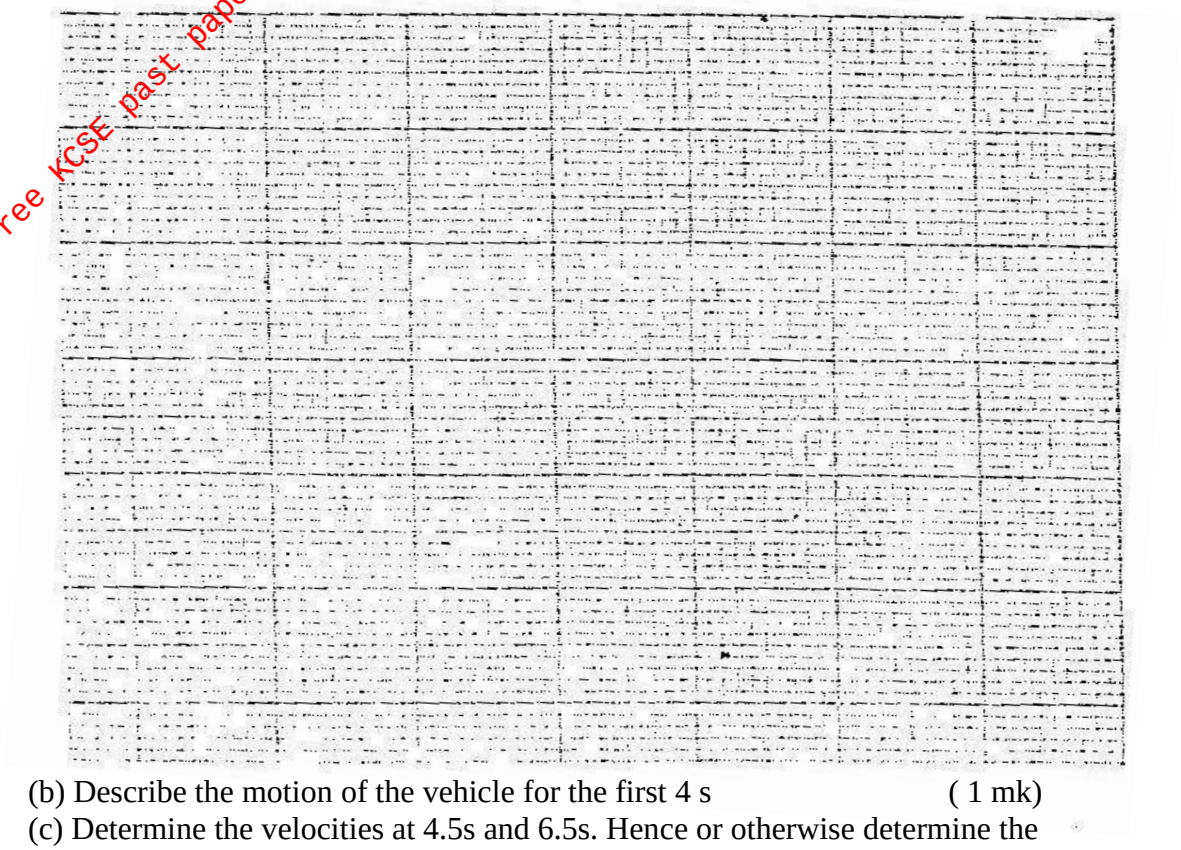
K.C.S.E 1995 PHYSICS PAPER 232/2
SECTION 1 (65 MARKS)

Answer all the questions in this section in the spaces provided

1. The data in the table below represents the motion of vehicle over a period of 7 seconds

Time (sec)	0	1	2	3	4	5	6	7
Displacement	0	20	40	60	80	95	105	110

(a) plot on the grid provided, a graph of displacement (y- axis) against time (5 mks)



(b) Describe the motion of the vehicle for the first 4 s (1 mk)

(c) Determine the velocities at 4.5s and 6.5s. Hence or otherwise determine the average acceleration of the vehicle over this time interval

2. Study the circuit diagram in figure 1 and answer the following questions

Fig.1

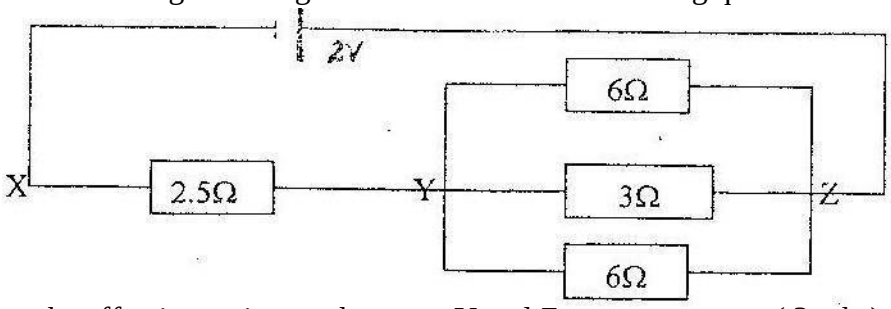


Fig 1

(a) Calculate the effective resistance between Y and Z (3 mks)

(b) Determine the current through the 3 Ω resistors (6 mks)

(c) One of the 6Ω resistor has a length of 1.0m and cross –section area of 5.0×10^{-6} m^2 (3 mks)

Calculate the resistivity of the material

3. (a) An object O is placed in front of convex mirror as shown in figure 2

Fig.2

Fig. 2

(i) Draw to scale a ray diagram to show the position of the image (5 mks)
(ii) Determine the magnification (3 mks)

(b) An object placed in front of a convex lens of focal length 10 cm produces an image at a distance of 15 cm from the lens and on the same sides as the object

Determine the position of the object (4 mks)

4. (a) Draw a ray diagram to show how a convex lens works as a magnifying glass (5 mks)

(b) The diagram in figure 3 shows a certain eye defect

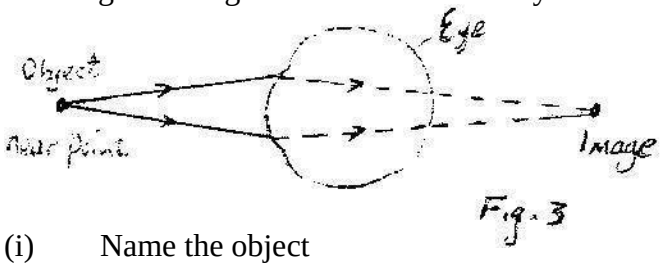


Fig. 3

(i) Name the object
(ii) Draw on the same diagram an arrangement to correct the defect (1 mk)

(c) (i) Explain why a pail of water can be swung in vertical circle without the water pouring out (3 mks)

(ii) A car of mass 1200kg is moving with a velocity of $25ms^{-1}$ around a flat bend of radius 150m. Determine the minimum frictional force between the tyres and the road that will prevent the car from sliding off. (4 mks)

5. (a) (i) State the law of electromagnetic induction (2 mks)
(ii) Describe an experiment to demonstrate Faraday's law (4 mks)

(b) (i) A researcher studying the behaviour of step- up transformer made the following observations:
"More joules per coulomb and fewer coulombs per second at the output than at the input terminals

Explain why the observation does not imply a violation of the principle of conservation of energy (4 mks)

(ii) A transformer of 480 turns in the primary coil is used to connect a 9 volt a.c electric device to a 240 v.a.c mains power supply. Calculate the number of turns in the secondary coil.
(3 mks)

SECTION II (15 MARKS)

Answer one question from this section

6. (a) Distinguish between stationary and progressive waves (1mk)
(b) (i) describe how a young's double slit may be made in a laboratory (2mks)
(ii) State the condition for a minim to occur in an interference pattern (1mk)
(c) The sketch graph in fig 4 shows the results of an experiment to study diffraction patterns using a double slit.

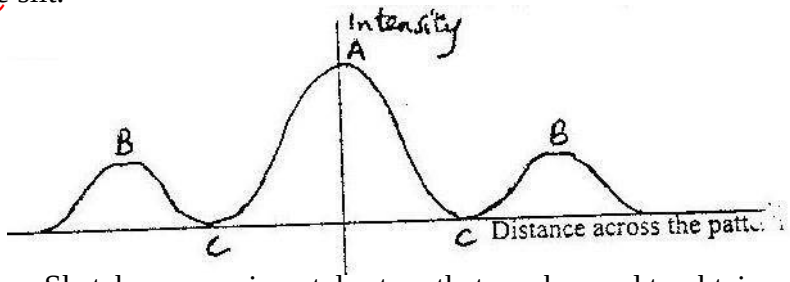


Fig. 4

(i) Sketch an experimental set up that can be used to obtain such a pattern
(4 mks)
(ii) Name an instrument for measuring the intensity (1 mk)
(iii) Explain how the peaks labeled A and B, and troughs labeled C are formed (6 mks)

7. (a) Describe how a p- type semi conductor is formed (3 mks)
(b) Distinguish between p- n- p and n – p – n transistors (1 mk)
(c) The sketch in the fig 5 shows the results of an experiment where a transistor was used as a voltage amplifier

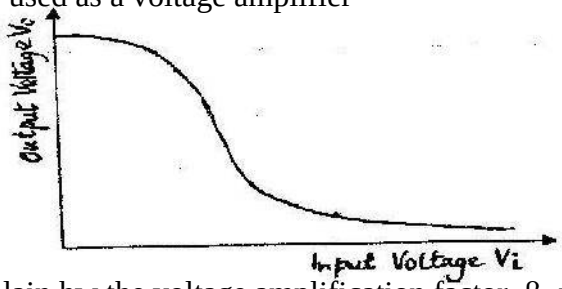


Fig. 5

Explain hw the voltage amplification factor, β, may be obtained from the sketch graph
(4 mks)
(d) (i) Draw a circuit diagram of p – n – p transistor operating in the common emitter (C-E) mode indicate on the diagram the directions of the collector current I_c the base current I_B the emitter current I_E (4 mks)

(ii) Write the equation relating I_C I_B I_E (1mk)

(e) Identify the type of biasing in each of the junctions of a transistor in operation
(2 mks)