



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY
DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

ELECTRICAL POWER ENGINEERING

**MODULE: Engineering Drawing and Electrical
Circuit Designing**

**PAPER NO: 321/25/M03
321/22/M03
321/18/S08**

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

1. Drawing instruments
2. Drawing paper A4
3. Exam folder

INSTRUCTIONS TO CANDIDATE

1. Answer all questions in Section A.
2. Choose one (1) question from Section B.

QUESTION 1

Construct an escribed circle to a triangle.

(10 marks)

QUESTION 2

State the abbreviations for the following terms:

- | | |
|---------------------------|----------|
| a) Across flats | (1 mark) |
| b) Centre line | (1 mark) |
| c) Chamfered | (1 mark) |
| d) Counter sunk | (1 mark) |
| e) Cylinder / cylindrical | (1 mark) |
| f) Diameter | (1 mark) |
| g) Drawing | (1 mark) |
| h) Hexagon head | (1 mark) |
| i) Insulation | (1 mark) |
| j) Specification | (1 mark) |

QUESTION 3

A grinding mill has a drive system which uses 2 pulleys and a v-belt. Given that the pulleys are shown on drawing paper with radii 10mm and 22mm respectively and they are positioned 110mm apart centre to centre. Draw the v-belt appearing as 2 external tangents to the pulleys.

(15 marks)

QUESTION 4

Reproduce in isometric projection, the orthographic views shown in Figure 1. The lowest point for the isometric drawing is at corner – C. (15 marks)

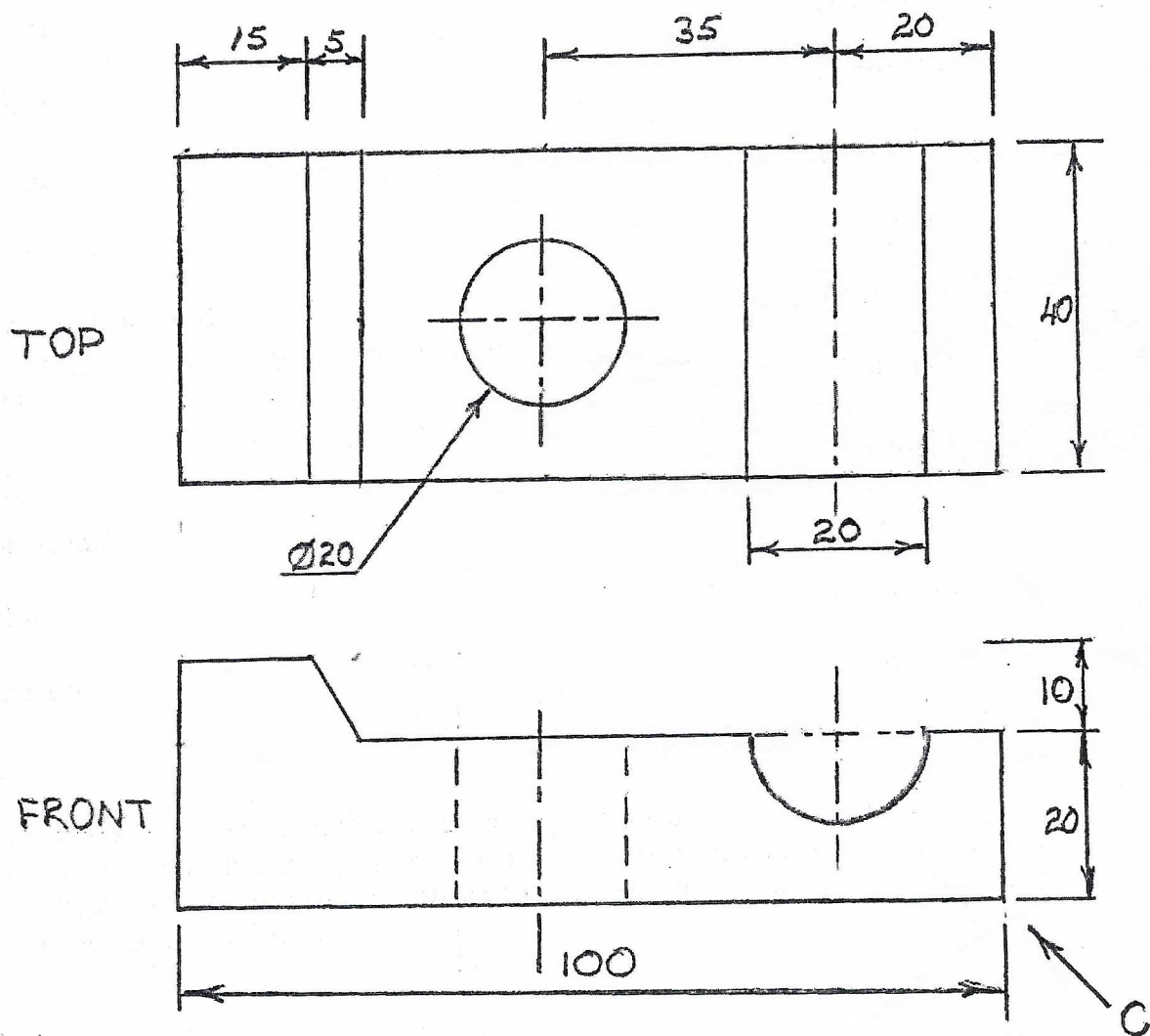


Figure 1

QUESTION 5

From the orthographic views shown in Figure 2, construct in isometric projection the object produced when the front view is sectioned along section plane v - v, given the lowest corner to be at point B.

Fully dimension your work.

(20 marks)

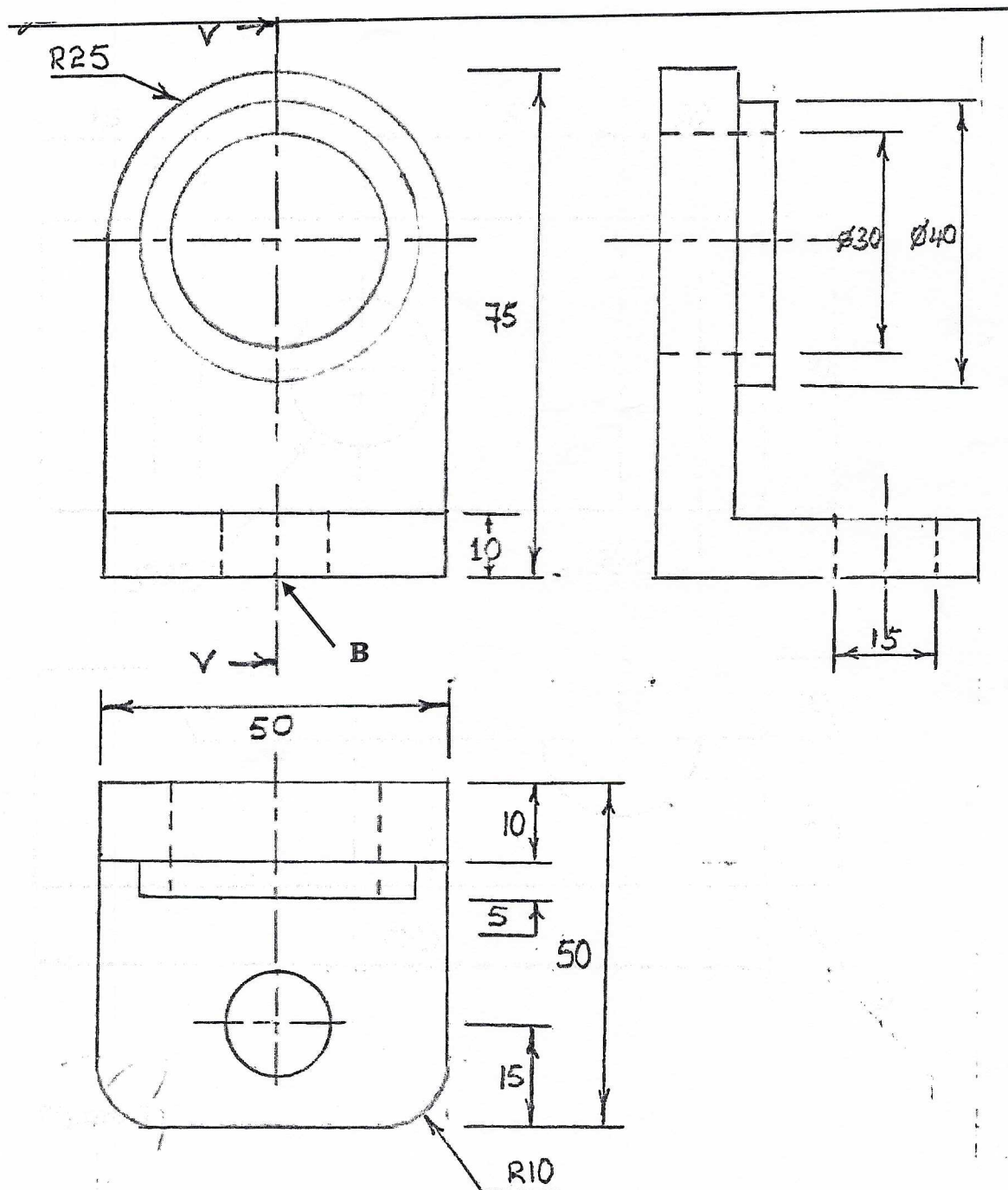


Figure 2

QUESTION 6

Draw the control and power circuit diagrams for starting a motor using direct on line (DOL) starter.

Clearly label all components.

(30 marks)

QUESTION 7

Convert the relay logic circuit in Fig 3 below to a ladder diagram. (30 marks)

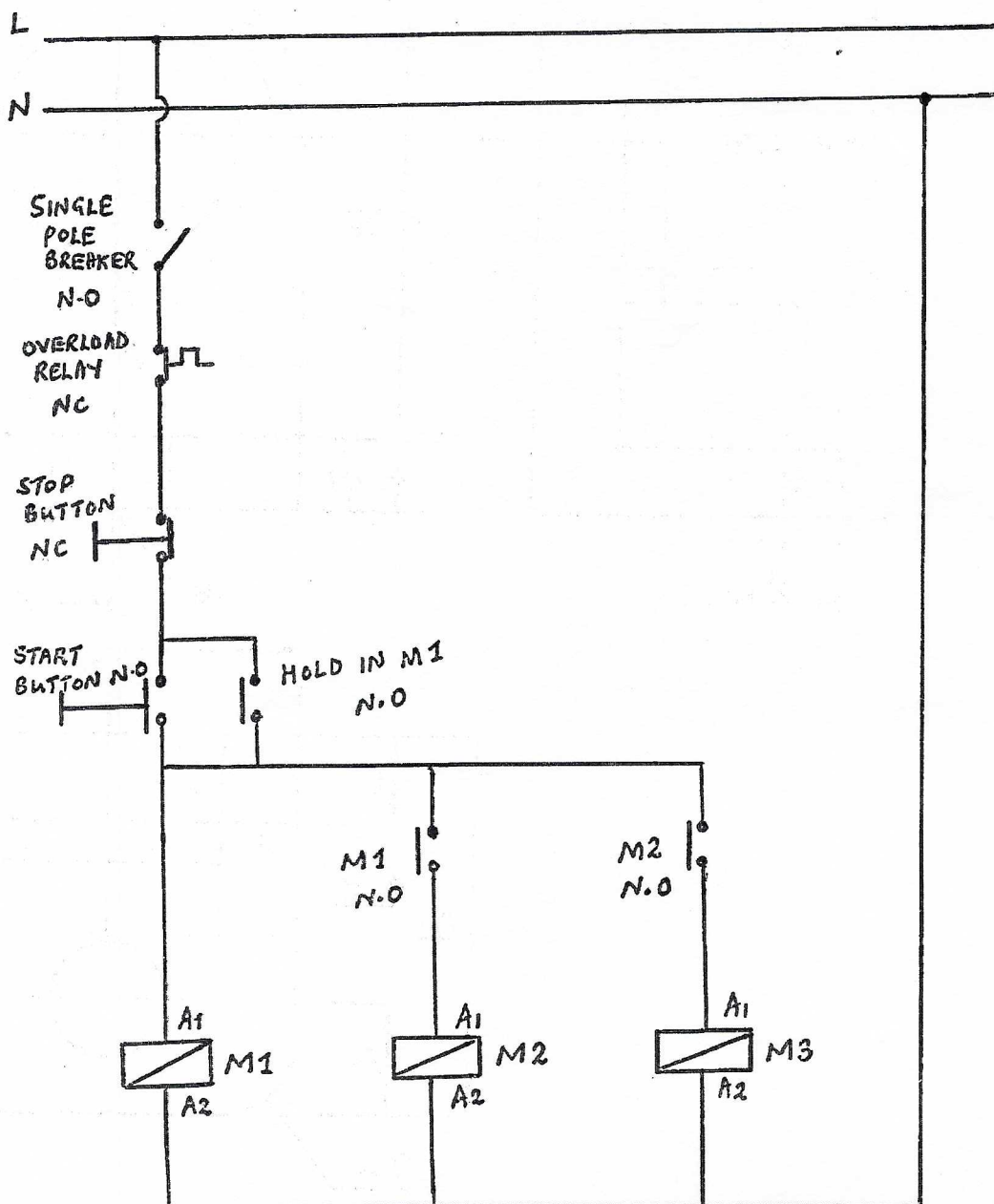


Figure 3

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DESIGNING

QUESTION 8

Draw a circuit diagram of a Colpitts oscillator circuit.

(30 marks)

QUESTION 9

Draw a block diagram of a computer architecture and label its section.

(30 marks)

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