



ZIMBABWE

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

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

**PRECISION MACHINING, MOTOR MECHANICS, AUTO ELECTRICS, DIESEL
PLANT FITTING, MOTOR VEHICLE BODY REPAIR, MOTOR CYCLE
MECHANICS**

**SUBJECT: Automotive Engineering Drawing
MODULE:**

**PAPER NO: 346/13/S04
346/25/M03**

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

1. Drawing instruments.
2. 6 × A4 and 1 × A3 bond papers.

INSTRUCTIONS TO CANDIDATE

1. Section A: Answer all questions – (10 marks).
2. Section B: Answer any five (5) questions – (50 marks).
3. Section C: Compulsory question – (40 marks).

This paper consists of 5 printed pages.

SECTION A

QUESTION 1

- 1.1 In which type of Lettering do you find all the alphabets being of uniform width and thickness? (1 mark)
- 1.2 State the size of an A4 paper. (1 mark)
- 1.3 In isometric projection the inclined lines are drawn at an angle of ----- degrees. (1 mark)
- 1.4 Define Pictorial projection. (1 mark)
- 1.5 Explain the purpose of a dimension line. (1 mark)
- 1.6 Give one example of a reducing scale. (1 mark)
- 1.7 Define plane geometry. (1 mark)
- 1.8 The abbreviation S'FACE means. (1 mark)
- 1.9 Information about a drawing is contained in the ----- . (1 mark)
- 1.10 Circles which have different radii but sharing the same centre are called ----- circles. (1 mark)

SECTION B

QUESTION 2

- a) Construct a triangle ABC

AB = 70mm

BC = 90mm

Angle $\hat{A}BC = 60^\circ$

(10 marks)

- b) Construct a circumscribed circle to the above triangle.

QUESTION 3

Two circles of diameter 20mm and 40mm are 50mm apart from centre to centre. Join them by means of an Internal arc R25 and an external arc R60.

Show all construction.

(10 marks)

QUESTION 4

Construct a regular octagon in a square of 80mm.

(10 marks)

QUESTION 5

What is the meaning of the following abbreviations in accordance with BS 308.

- | | | |
|----|--------|----------|
| a) | S FACE | (1 mark) |
| b) | M/CD | (1 mark) |
| c) | O/D | (1 mark) |
| d) | TPI | (1 mark) |
| e) | CSK | (1 mark) |
| f) | HEX HD | (1 mark) |
| g) | Ø | (1 mark) |
| h) | PCD | (1 mark) |
| i) | LH | (1 mark) |
| j) | CHAM | (1 mark) |

QUESTION 6

Describe the following terms as used in assembly drawing:

- | | | |
|----|--------------------|-----------|
| a) | Layout assemblies | (2 marks) |
| b) | Outline assemblies | (2 marks) |
| c) | General assemblies | (2 marks) |
| d) | Sub-assemblies | (2 marks) |
| e) | Section assemblies | (2 marks) |

QUESTION 7

Draw the standard symbols for the following:

- a) Battery
- b) Capacitor
- c) Photodiode
- d) DC motor
- e) Transistor
- f) Fixed displacement pump
- g) Hand pump
- h) Fixed displacement motor
- i) Single acting cylinder
- j) 2 way 2 position control valve

(10 marks)

QUESTION 8

- a) Show by tabulising the comparison of the first angle and third angle projection. (6 marks)
- b) Using diagrams show the difference between 1st Angle projection and 3rd Angle projection. (4 marks)

SECTION C

QUESTION 9

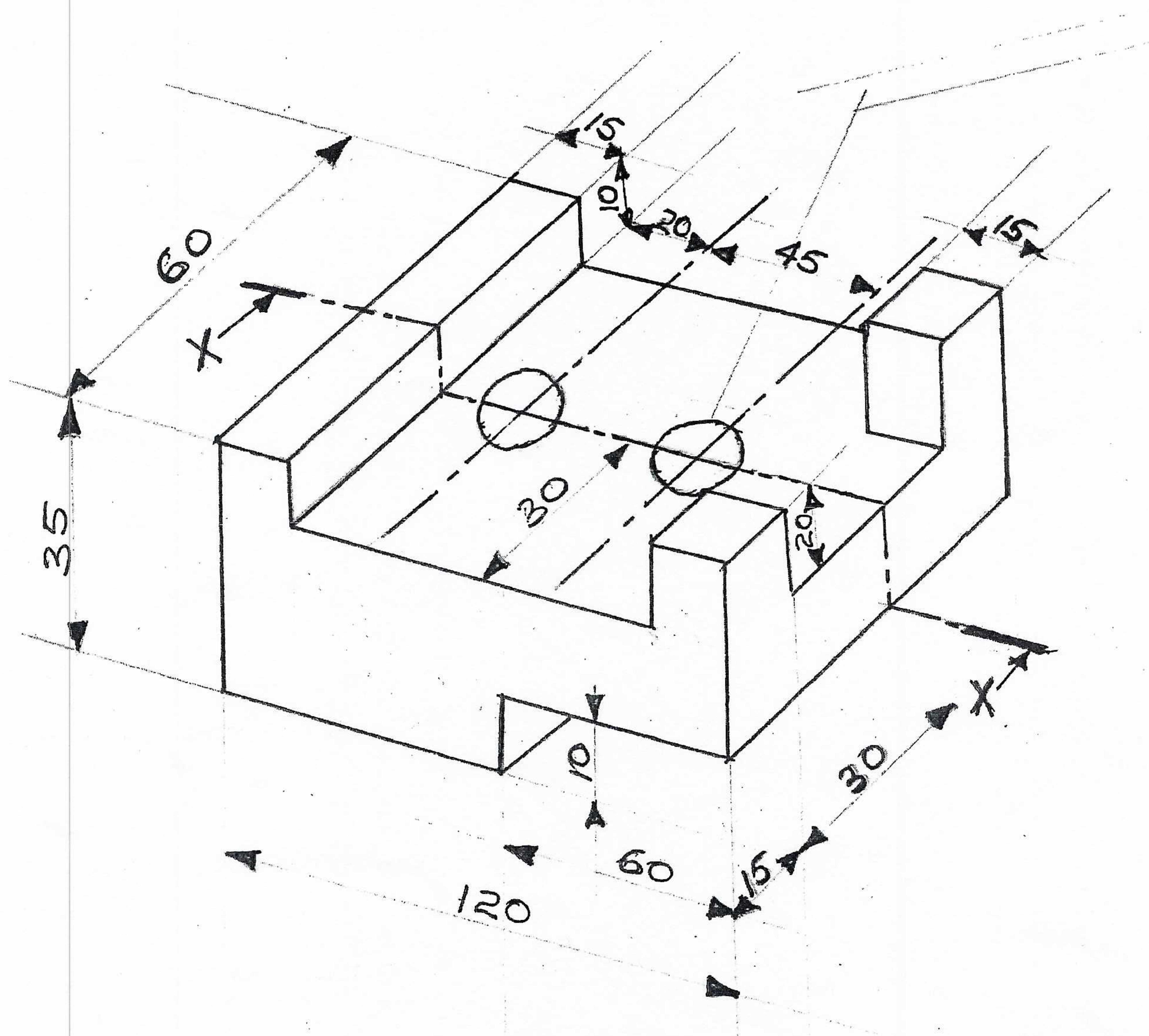
The diagram below shows a base plate. Draw full size the following views in 1st Angle projection.

- a) A sectional front view through X – X.
- b) End view
- c) A plan view

Show all hidden details.

NB: Include a suitable title block and a projection symbol

Include at least six (6) dimensions



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