

TECHNICAL DRAWING - HIGHER LEVEL
PAPER II (A) - ENGINEERING APPLICATIONS

200 marks

FRIDAY, 26 JUNE - MORNING 9.30 to 12.30

INSTRUCTIONS

- Answer four questions.
- All questions carry equal marks.
- Drawings and sketches should be in pencil unless otherwise stated.
- Where dimensions are omitted they may be estimated.
- Credit will be given for neat orderly presentation of work.
- Candidates should work on one side of the paper only.
- The Examination Number should be written on each drawing sheet used.
- All dimensions are in millimetres.

1. Figure 1 shows the plan and elevation of a carburettor body.

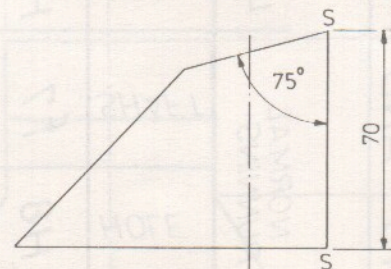
(a) Draw the following views of the carburettor in first or third angle projection:-

- A sectional elevation on A-A.
- A sectional plan on B-B.

Hidden edges are not required.

(b) Insert the following on the drawing:-

- Title: CARBURETTOR BODY.
- ISO projection symbol.
- Cutting planes and titles on sectional views.
- Four leading dimensions.



2. The plan and elevation of a ventilation system duct are shown in Fig. 2.

- Draw the given views and project an end elevation.
- Measure and state the value of the fold angle between the surfaces A and B.
- Draw the true shape of the open top C.
- Draw the surface development of the duct with the seam at S-S.
- Sketch freehand an internal grooved joint.

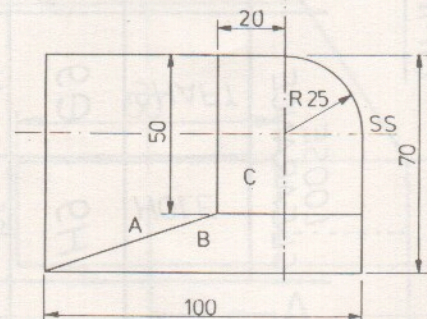


FIG. 2. FIG. 2.

3. Figure 3 shows a pin jointed link mechanism AC, BC, CD, driven by a simple gear train.

- (i) Plot the locus of point C for one revolution of A.
- (ii) Joint D on the link CD is fixed in a block which slides on the line RS. Measure and state the stroke length of D.
- (iii) Plot the displacement of D for one revolution of A.

4. A cleat and secondary beam are shown in Fig. 4. The cleat is joined by fillet welding to the web of the secondary beam and by bolting to the web of the main beam.

- (a) Draw a pictorial view of the beam to beam connection with the top flanges flush.

Main beam: Depth 250 mm, width 150 mm, web thickness 7 mm, flange thickness 12 mm, root radius 8 mm.

- (b) Insert the following on the drawing:
 - (i) Dimension for 6 mm fillet weld.
 - (ii) Symbol for site fitted high strength friction grip bolts.
 - (iii) Title: BEAM TO BEAM CONNECTION.

5. (a) A cross section of an engine through one cylinder is shown in Fig. 5. Identify, sketch and label the following parts:

Carburettor, piston, connecting rod, valve, rocker arm, push rod, cam, distributor and sparking plug.

Sketch to show the outline of each component, in position, as illustrated in Fig. 5.

- (b) Draw and dimension the following:-
 - (i) A keyway on a shaft.
 - (ii) A counterbored hole.
 - (iii) A 2 micrometer (μm) machine surface.
 - (iv) Three holes, unequally spaced, on a circular pitch.

6. (a) Draw the profile and displacement diagram for a cam rotating in an anti-clockwise direction. The cam, with minimum radius of 40 mm, imparts the following motion to a 20 mm diameter roller follower:

Rise of 20 mm, with uniform velocity, for 105° of cam rotation.

Dwell for 45° of cam rotation.

Rise of 20 mm, with simple harmonic motion, for 90° of cam rotation.

Fall of 40 mm, with uniform acceleration and retardation, for the remainder of cam rotation.

- (b) Sketch freehand, a simple non-return ball valve. Indicate the direction of flow through the valve and label the parts.

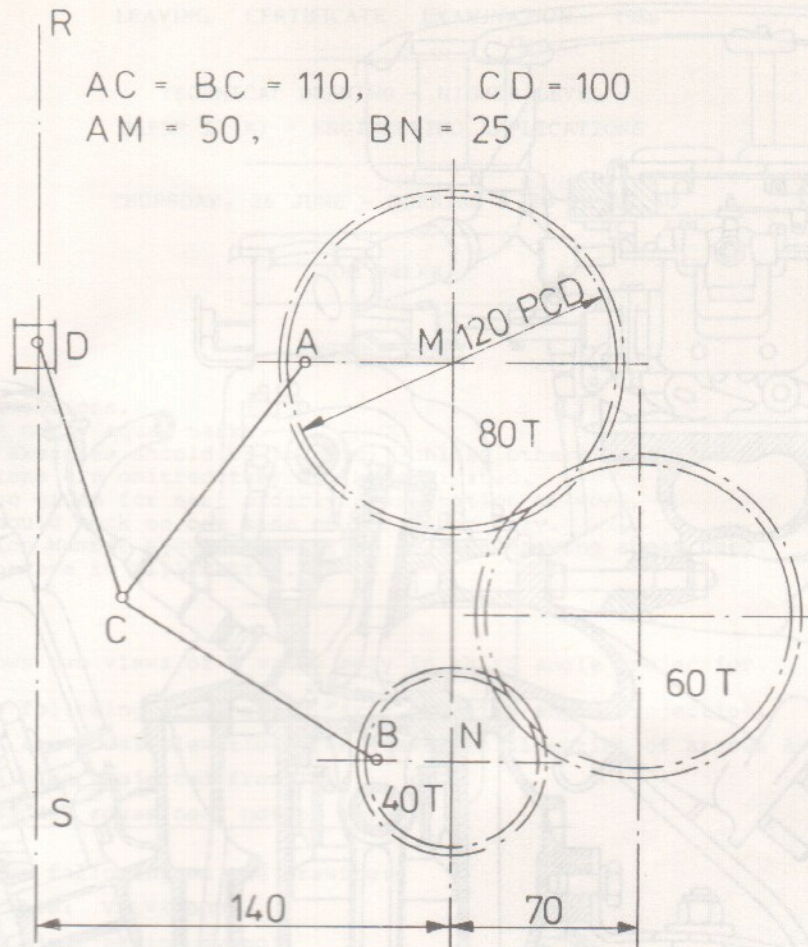
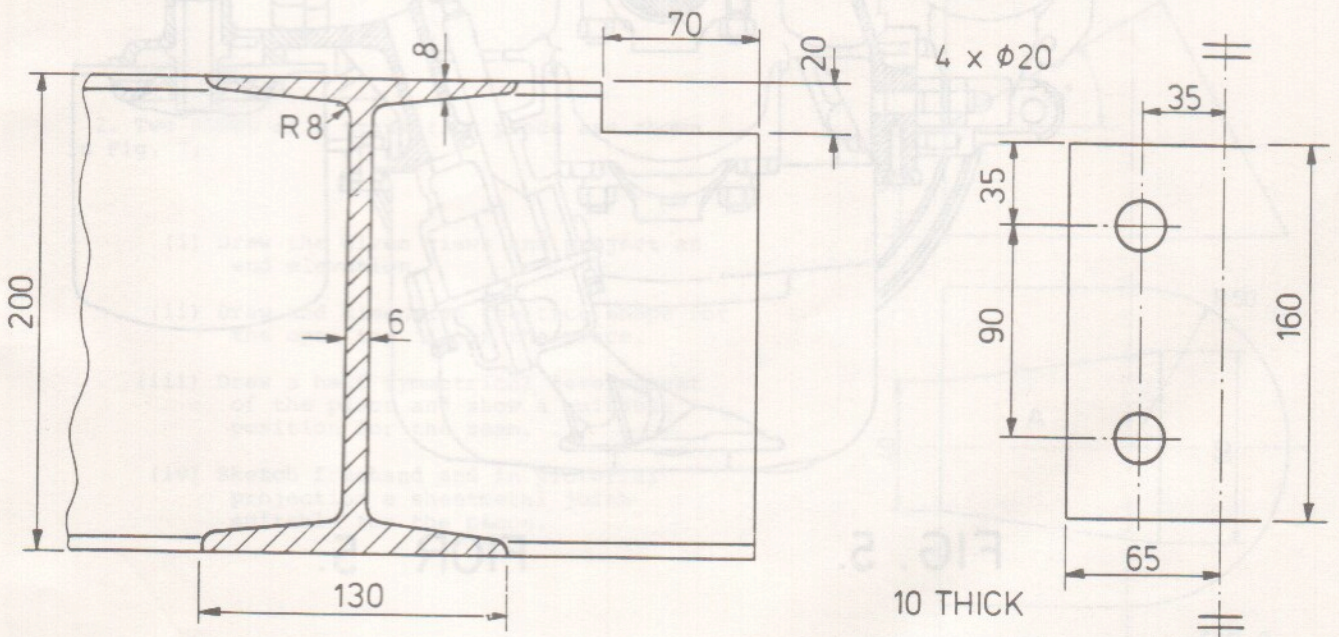


FIG. 3. FÍOR 3.



SECONDARY BEAM

CLEAT

FIG. 4. FÍOR 4.

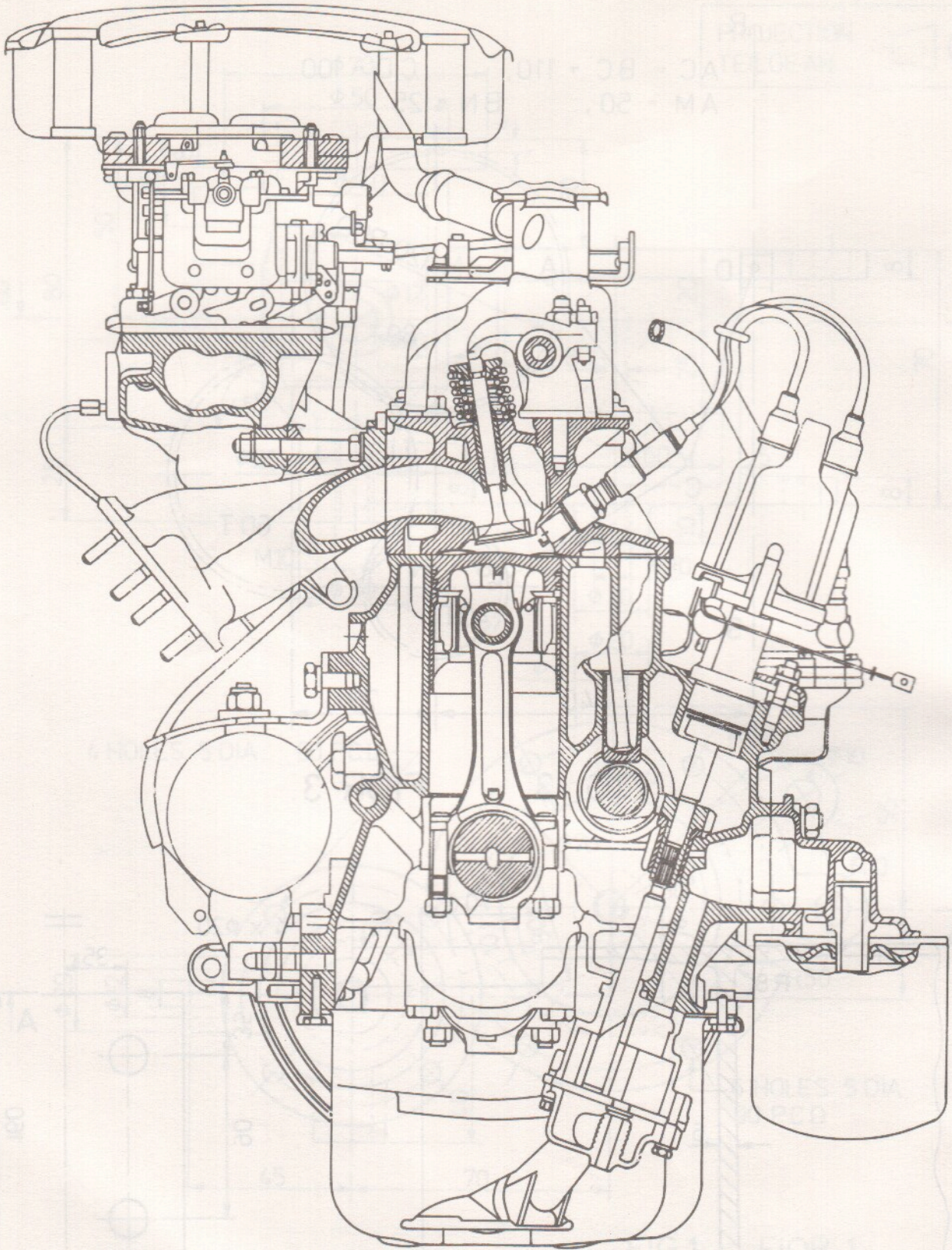


FIG. 5.

FIGOR 5.