

3.21 DRAWING AND DESIGN (449)

3.21.1 'UDZLQJ DQG 'HVLJQ 3DSHU 1 (449/1)

SECTION A (50 marks)

*Answer **all** the questions in this section on the answer sheet provided.*

- 1 (a) Write the following in full as applied in industrial training:
- (i) TVET;
 - (ii) NITA;
 - (iii) T.T.I. (3 marks)
- (b) State **two** uses of a beam compass. (1 mark)
- 2 (a) Define the following terms as used in the design process: (4 marks)
- (i) primary objective;
 - (ii) secondary objective;
 - (iii) design brief;
 - (iv) prototype.
- (b) With the aid of sketches, describe **three** types of dimensions in technical drawing. (3 marks)
- 3 State **one** use of each of the following computer components: (2 marks)
- (i) keyboard;
 - (ii) mouse;
 - (iii) monitor;
 - (iv) hard disk.
- 4 Construct a triangle of perimeter 165 mm whose sides are in the ratio of 3:5:6. (4 marks)

- 5 (a) List **four** factors to consider when lettering. (2 marks)
- (b) State **three** effects of poor disposal of engineering materials to the environment. (3 marks)
- 6 **Figure 1** shows a block drawn in isometric projection. Sketch in good proportion the orthographic views of the block in first angle projection. (7 marks)

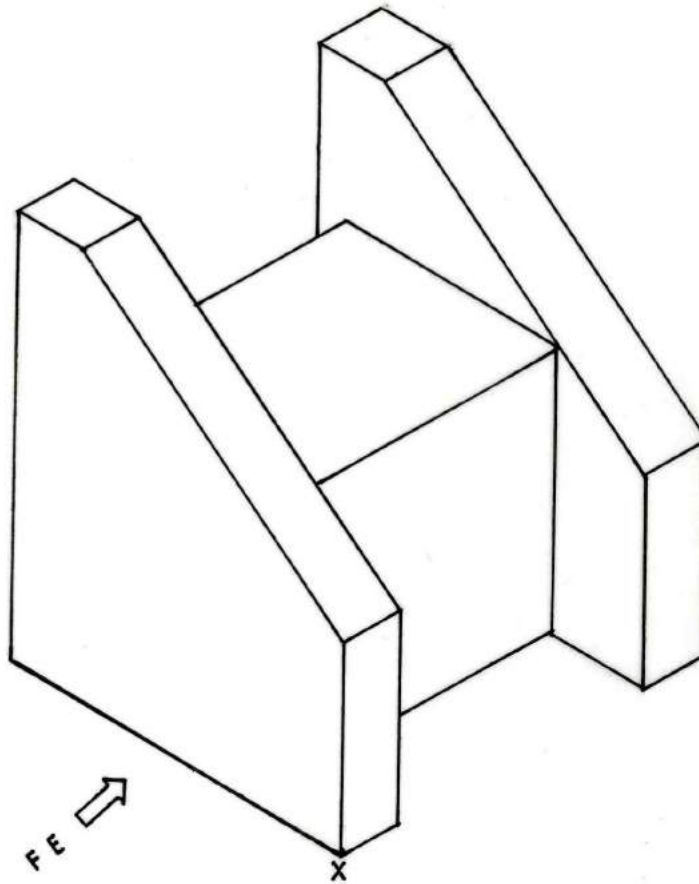


Fig. 1

7 **Figure 2** shows three views of a block drawn in third angle projection.

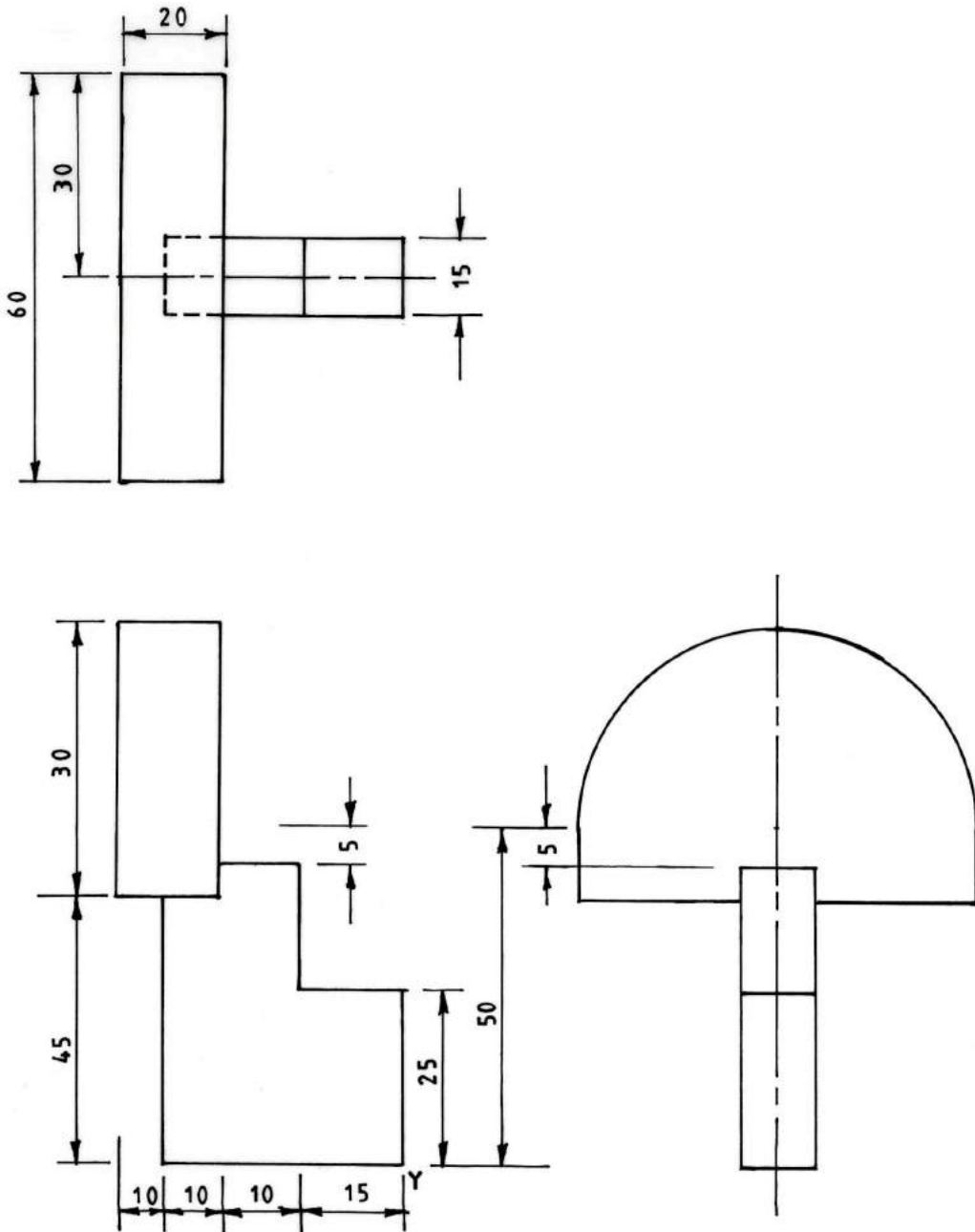


Fig. 2

On the isometric grid paper provided, sketch the pictorial view of the block taking “Y” as the lowest point.

(6 marks)

8 Construct a scale of 10:9 and draw **figure 3** using the scale.

(5 marks)

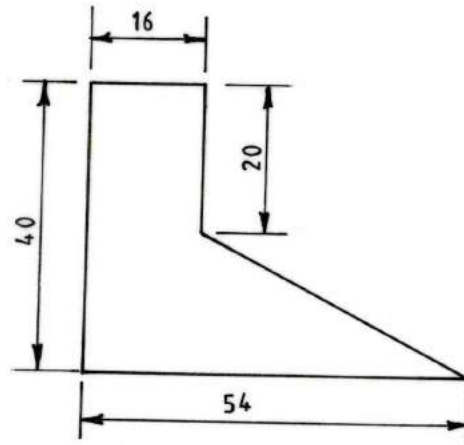


Fig. 3

9 An equilateral triangular prism is intersected by a cylinder at right angles as shown in **figure 4**.

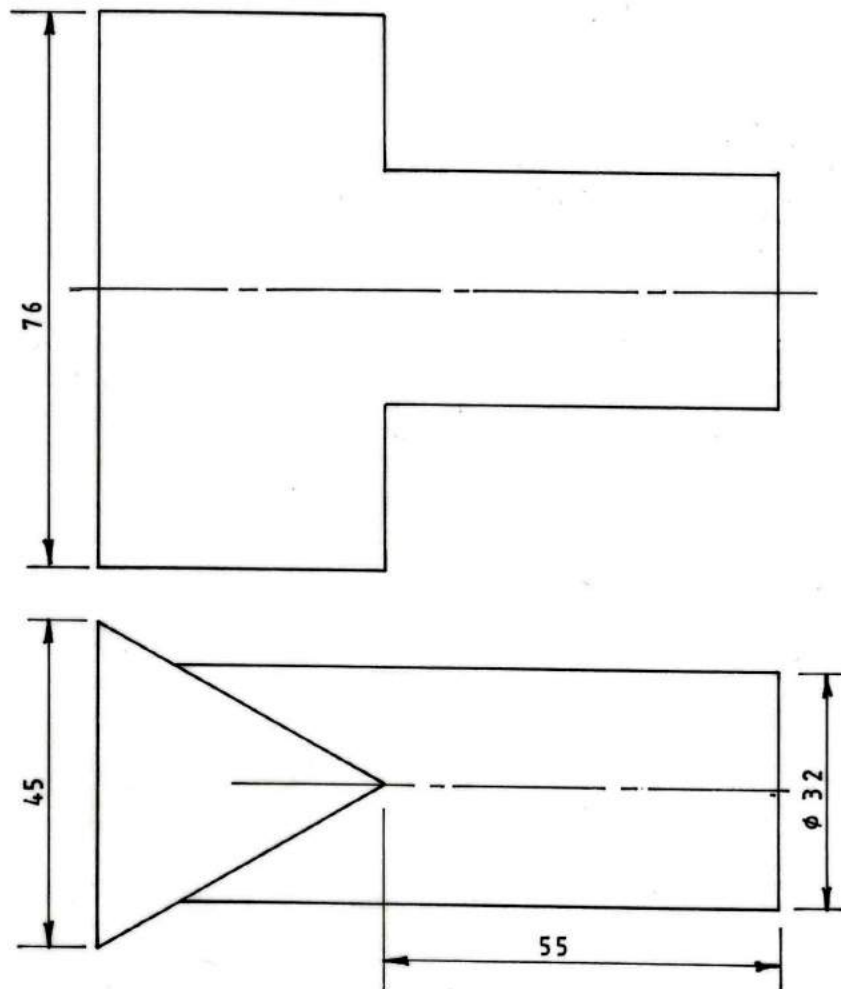


Fig. 4

Draw the line of intersection.

(5 marks)

10 Figure 5 shows views of two parts of a block drawn in first angle projection.

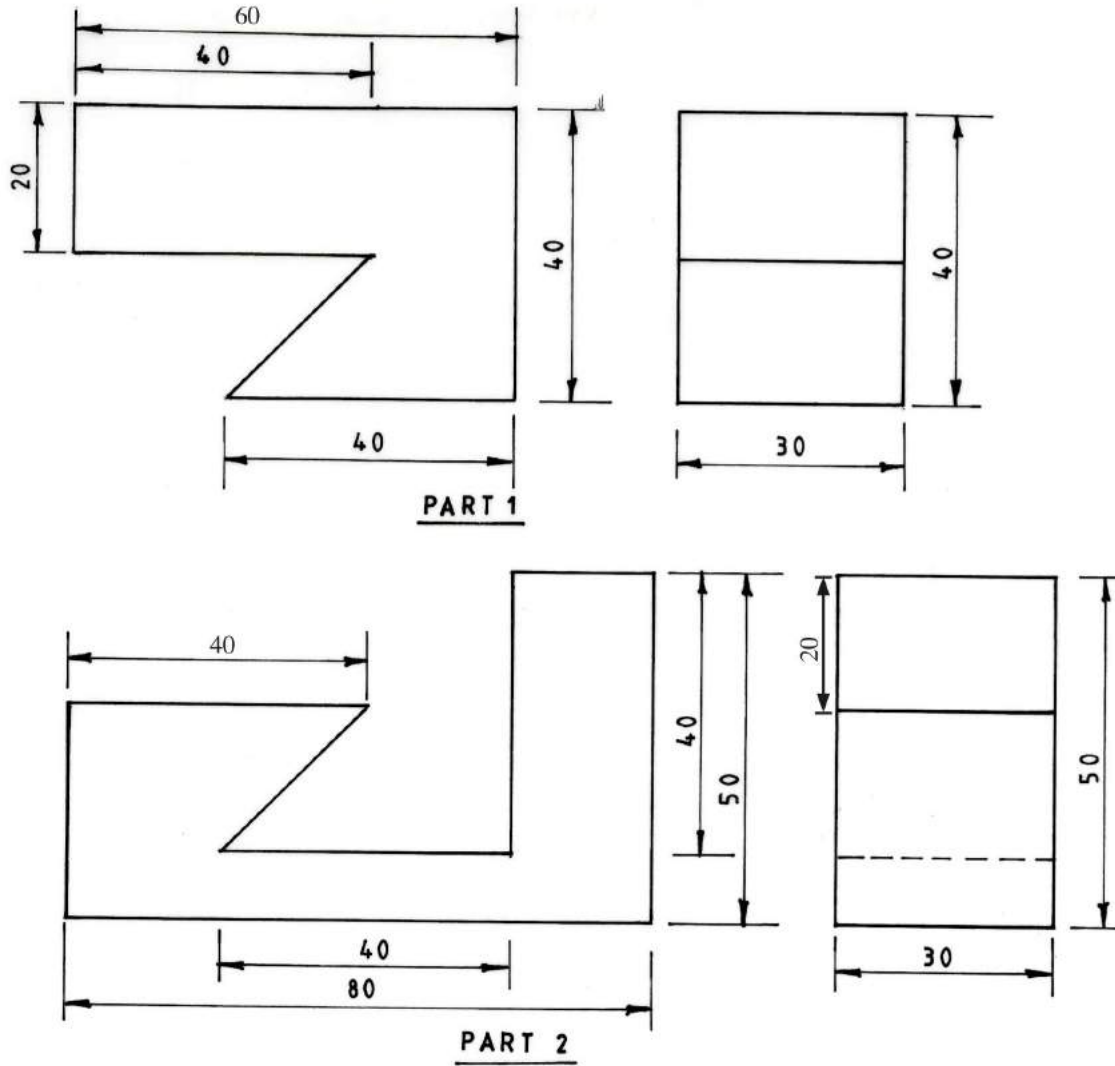


Fig-5

Assemble the parts and sketch in good proportion the oblique projection of the block. (5 marks)

SECTION B (20 marks)

COMPULSORY QUESTION.

11 Figure 6 shows parts of a machine component drawn in first angle projection. Assemble the parts and draw FULL SIZE the following:

- (a) sectional front elevation along the cutting plane P - P;
- (b) the plan;

Hidden details are not required. Unspecified dimensions are left to the candidate's discretion. (20 marks)

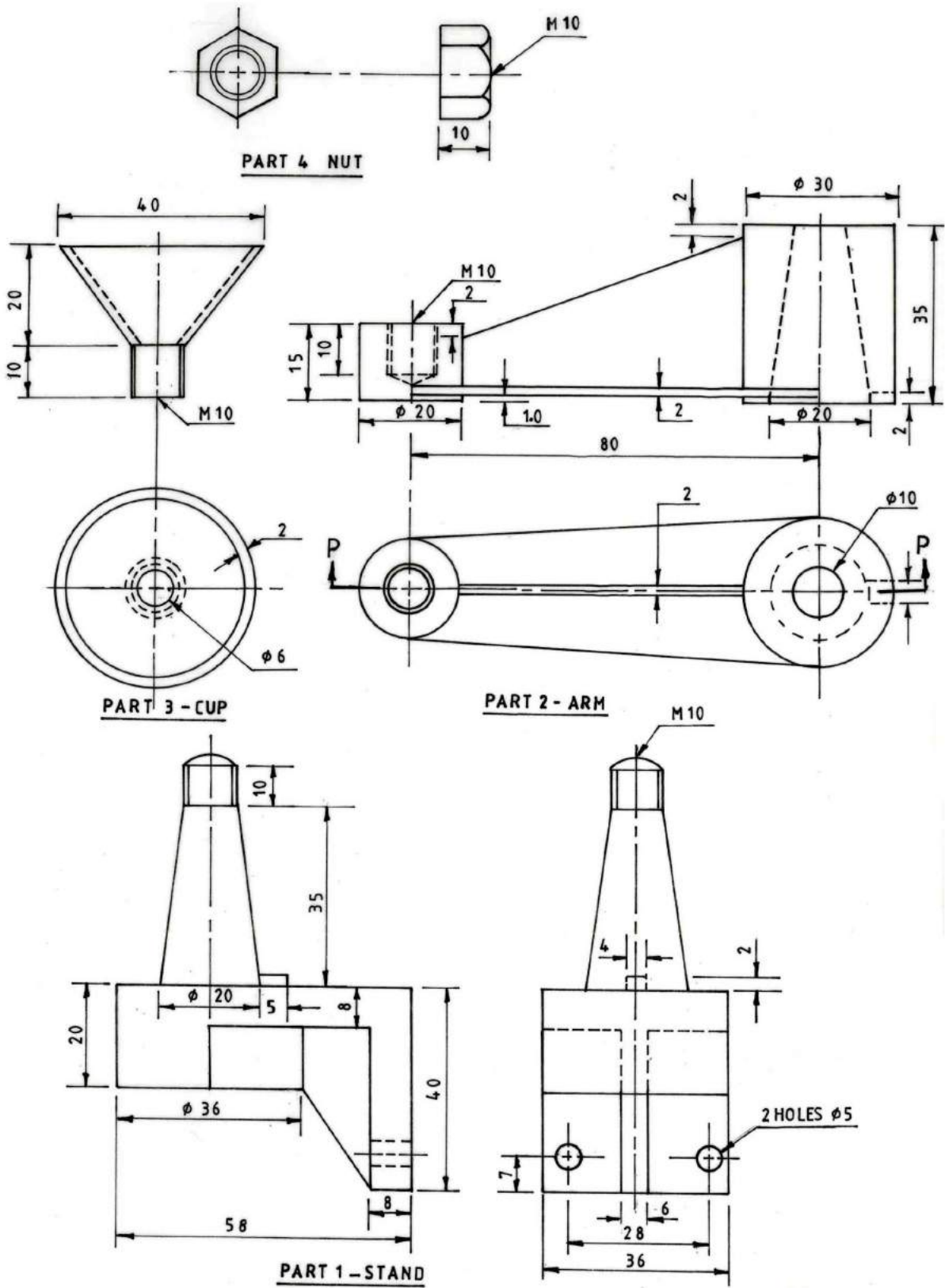


Fig. 6

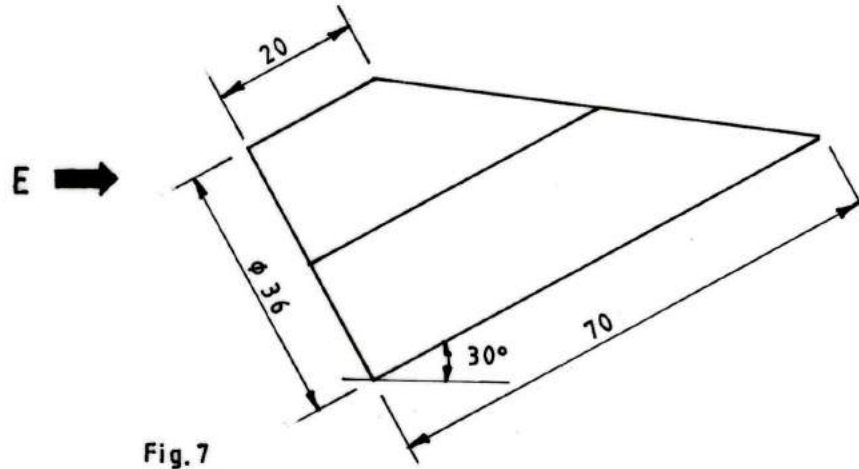
SECTION C (30 marks)

Answer any two questions from this section.

- 12** **Figure 7** shows the front elevation of a truncated hexagonal prism tilting at an angle of 30° . Copy the given view and draw the following in third angle projection:

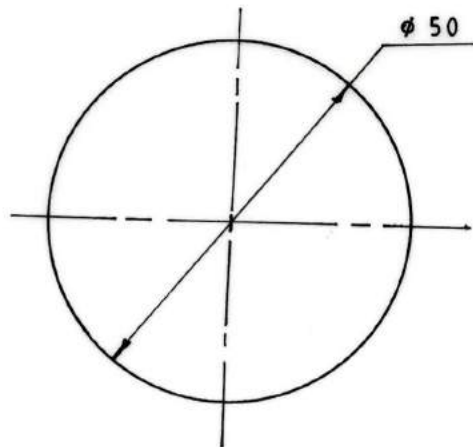
- (i) end elevation in the direction of arrow E;
- (ii) the plan.

(15 marks)

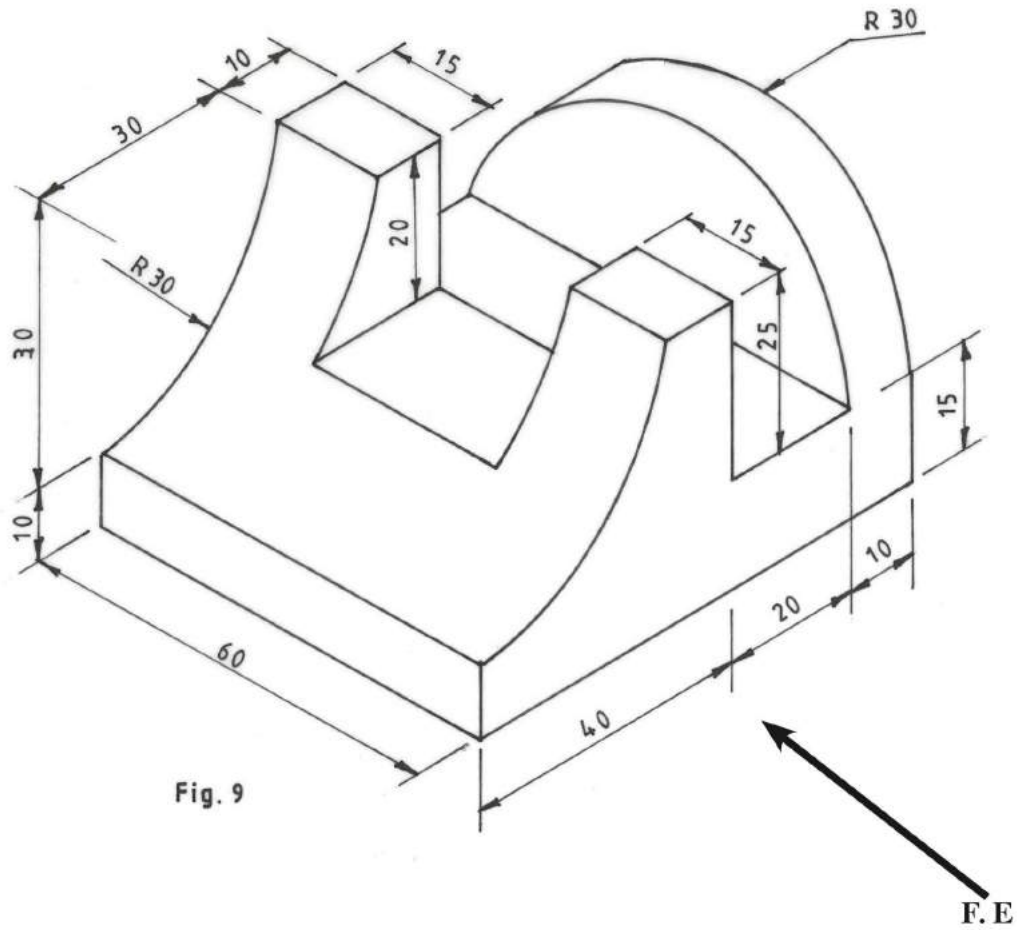


- 13** **Figure 8** shows the plan of an object. A string attached to its circumference is wound tight. Trace the path followed by a mark P on the string as it unwinds through one revolution.

(15 marks)



14 Figure 9 shows a block drawn in isometric projection.



Draw FULL SIZE in first angle projection the three orthographic views of the block.
(15 marks)

3.21.2 'UDZLQJ DQG 'HVLJQ 3DSHU 2 (449/2)

'(6,*1 352%/(0: (40 PDUNV)

3HRSOH KDYH KDG VHULRXV DFFLGHQWV FDXVHG E\ WKH XVH RI ODGGHUV WKDW DUJ
'HVLJQ D ODGGHU FRQVLGHULQJ WKH IROORZLQJ:

1. ,W VKRXOG SURYLGH D UHDVRQDEO\ VWURQJ JULS ZKHQ OHDQLQJ RQ D F\OLQGUI
 2. ,W VKRXOG KDYH UXQJV (VWHSV) WKDW PDNH WKH XVHU FRPIRUWDEOH ZKHQ Z
 3. ,W VKRXOG KDYH SURYLVLRQ IRU H[WHQVLRQ DV WKH ZRUNLQJ KHLJKW LQFUHI
 4. ,W VKRXOG EH IROGHG IRU HDVH RI VWRUDJH DQG WUDQVSRUWDWLRQ.
- !" ,WV"EDVH"VKRXOG"SURYLGH"D"ÀUP"JULS"WR"WKH"JURXQG!

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- (D) 0DNH IUHHKDQG VNHWFKHVRI LEOH VROXWLRQV IRU \RXU GHVLJQ. (6 PDUNV)
- (E) 6HOHFW "RI"WKH"GHVLJQV"LQ"7D8"DERYH"DQG"PDNH"D"UHÀQHG"ODEHOOHG"SI (9 PDUNV)
- (F) 0DNH GHWDLOHG VNHWFKHV RI WKH PHFKDQLVPV WR DOORZ IRU HDFK RI WKH F (20 PDUNV)
- (G) /LVW2 PDWHULDOV XVHG DQG VMDWRQ IRU WKH FKRLFH RI HDFK. (3 PDUNV)
- (H) 1DPH7:2 PHWKRGV RI MRLQLQJ WKH SDUWV DQG VWDWH ZKHUH HDFK LV XVH (2 PDUNV)