TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of Mechanical & Automotive Engineering
UNIVERSITY EXAMINATION FOR:
BSc. Mechanical Engineering
BSc. Electrical & Electronics Engineering
EMC 4111 : Engineering Drawing I
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: SEPTEMBER 2018
TIME: 3 HOURS
DATE: Sep 2018

Instruction to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Non-Programmable scientific calculator*

This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions. All length dimensions are in ***mm.***

Maximum marks for each part of a question are as shown.

Do not write on the question paper.

Question ONE (Compulsory)

a) Figure 1(a) shows a metal plate which has been poorly dimensioned. Copy the given diagram and by proper dimensioning using chain technique, distinguish between aligned and unidirectional methods of dimensioning. In each case, use a separate diagram.

(6 Marks)

b) Figure 1(b) shows two orthographic views of a machine component drawn in first angle projection. From the views, you are required to copy the plan and then draw in full size the following views of the component.

(i) A sectional front elevation defined by the cutting plane A-A.
(ii) An end sectional elevation defined by the cutting plane B-B. .

Add all the necessary dimensions (24 Marks)

Question TWO

Figure 2 shows views of a certain metal block drawn in third angle projection. Draw, full size, the isometric projection of the block making the corner marked A to be the lowest point of the drawing.

No dimensioning is required. (20 Marks)

Question THREE

a) Figure 3(a) shows the profile of machine bracket. Construct the profile to scale and show the construction work. No dimensioning is required. (8 Marks)

b) Figure 3(b) shows a rod AB which is attached to the crank OA at A. OA rotates about O and the rod AB is constrained to pass through the point Q. Draw the locus of the end point B for one complete revolution of OA. Take: OA=225 mm; AB=900 mm and OQ=525 mm. Use an appropriate scale. (12 Marks)

Question FOUR

Plot the cam profile which meets the following specifications:
Shaft diameter = 10mm
Minimum diameter = 26mm
Lift =25mm

Performance:

- $0 – 90^o$, uniform velocity to ½ maximum lift.
- $90^o – 180^o$, simple harmonic motion to maximum lift.
- $180^0 – 270^o$, uniform acceleration to ½ maximum lift
- $270^o – 360^o$, uniform retardation to maximum fall.

Take rotation to be clockwise.

(20 Marks)

Question FIVE

Figure 5 shows a double line drawing of a pipe layout. Re-draw the pipe layout in a single line drawing and appropriately label the various joints and parts of the piping system. (20 Marks)

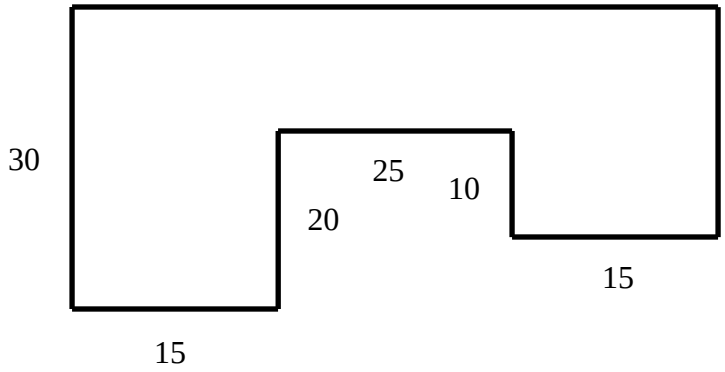

Figure 1(a)

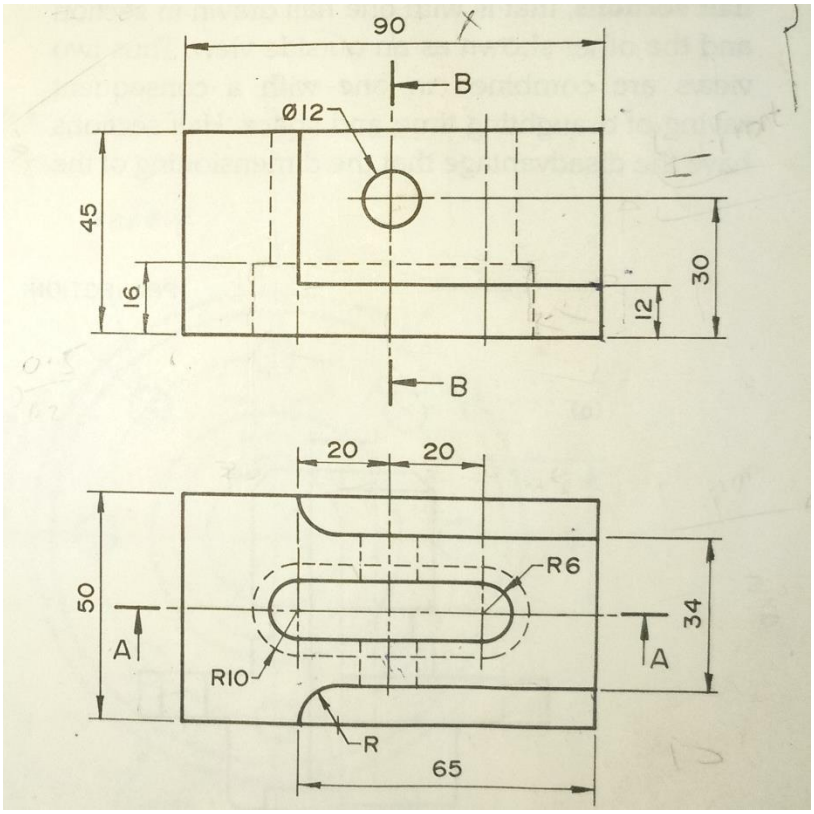

Figure 1(b)

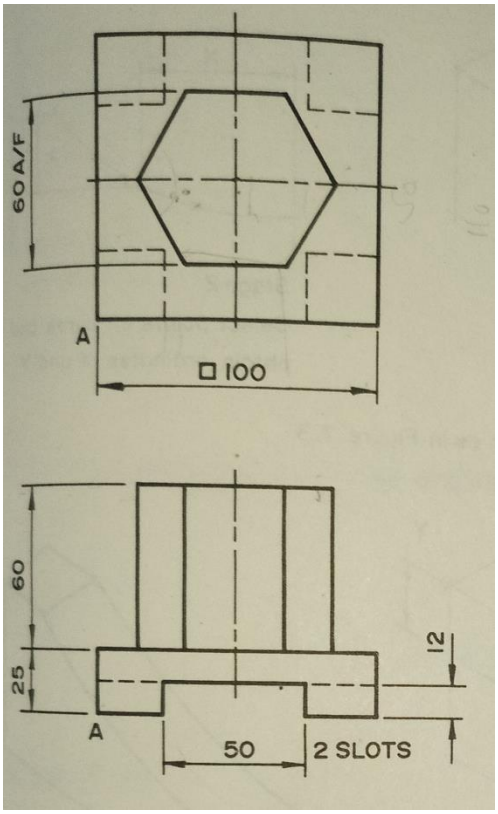

Figure 2

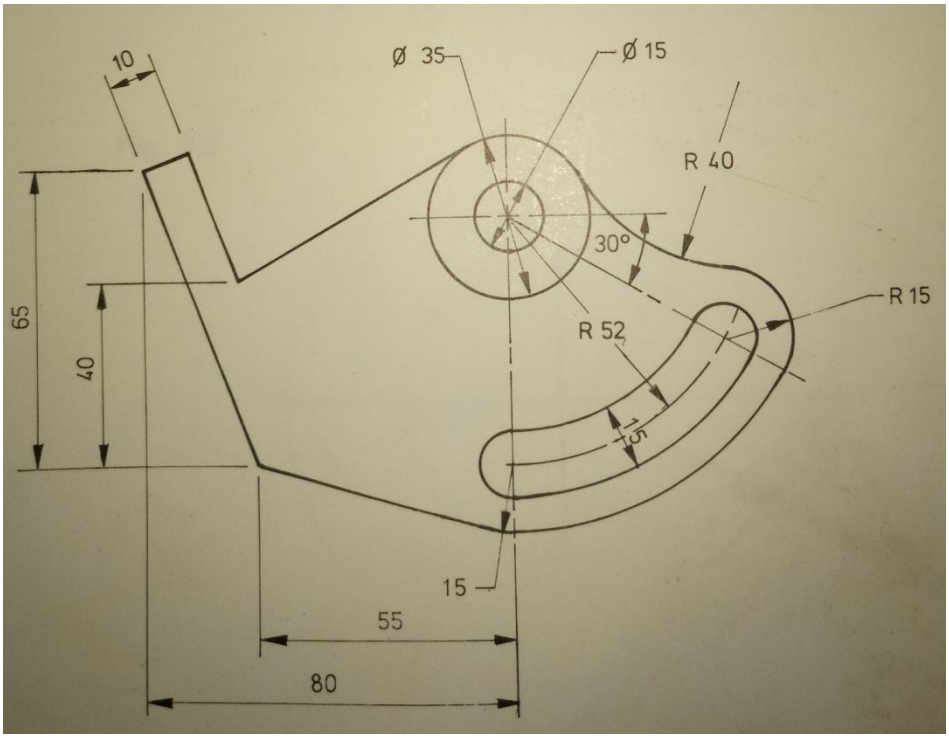

Figure 3(a)

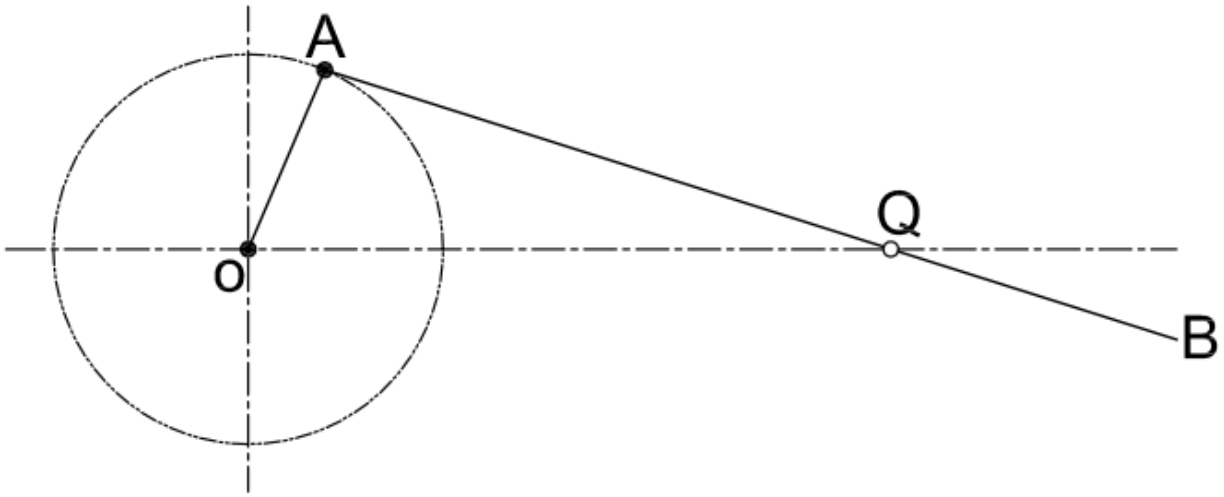

Figure 3(b)

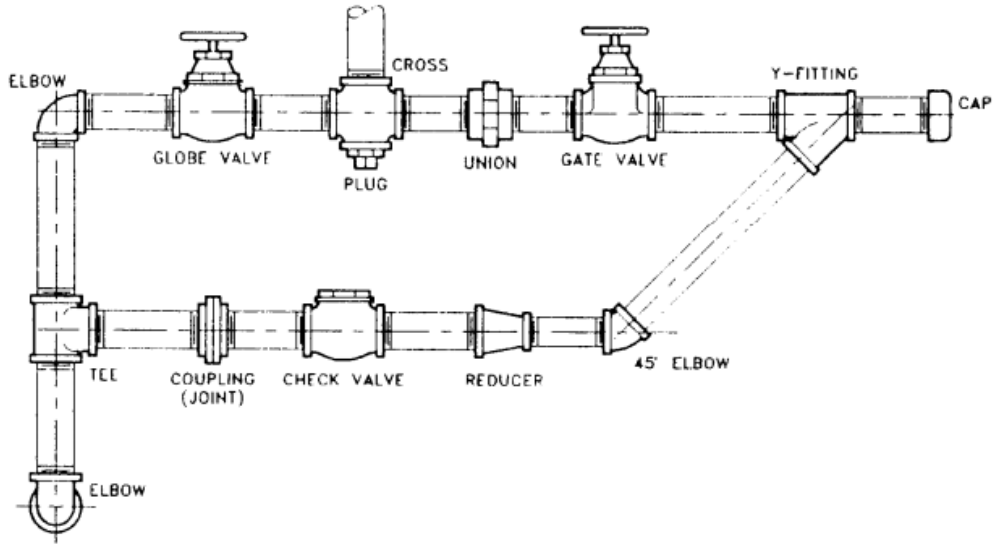

Figure 5