TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology
Department of Mechanical & Automotive Engineering
UNIVERSITY EXAMINATION FOR:
BTech. Mechanical Engineering
BTech. Marine Engineering
TMC 4111 : Engineering Drawing I
SPECIAL/SUPPLEMENTARY EXAMINATION
SERIES: SEPTEMBER 2018
TIME: 3 HOURS
DATE: Pick 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 baseline technique, distinguish between aligned and unidirectional methods of dimensioning. In each case, use a separate diagram.

(6 Marks)

b) An isometric projection of a machine component is shown in Figure 1(b). Draw full size, in first angle projection , the following views of the component:
    (i)   A sectional front elevation defined by the cutting plane B-B.
    (ii) An end elevation as seen from the direction of arrow E.
    (iii) A plan in projection with the front.

Add all the necessary dimensions.   (24 Marks)

Question TWO

Figure 2 shows the three orthographic views of a certain metal block. From the views, you are required to draw, to scale of full size, the isometric view of the block.
No dimensioning is required.   (20 Marks)

Question THREE

a) Construct a regular nonagon which is inscribed in a circle whose diameter is 80 mm.
                                                                                                 (8 Marks)

b) Figure 3 shows the slider-crank mechanism of a reciprocating engine which has a crank OA of length 450 mm and connecting rod AB of length 2100 mm. Draw the locus of point P located at the mid-point of AB. Use an appropriate scale.   (12 Marks)

Question FOUR

Plot the cam profile which meets the following specifications:
Shaft diameter = 20mm
Minimum cam diameter = 50mm
Performance:
$0 – 90^o$, 20mm rise with uniform velocity.
$90^o – 180^o$, 30mm rise with simple harmonic motion.
$180^o – 270^o$, dwell period.
$270^o – 315^o$, 20mm fall with uniform acceleration.
$315^o – 360^o$, 30mm fall with uniform retardation.
Take rotation of cam 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)
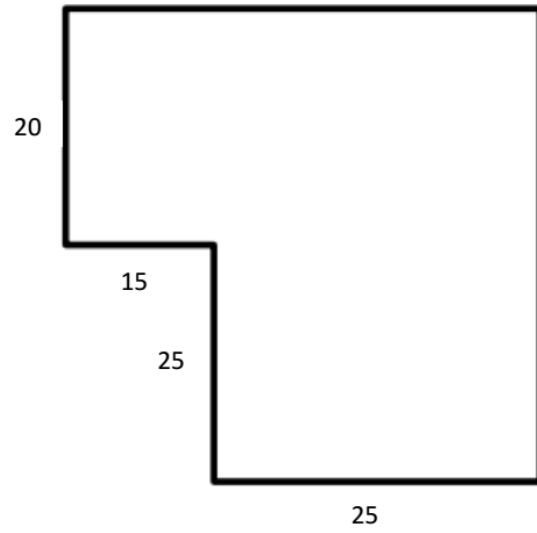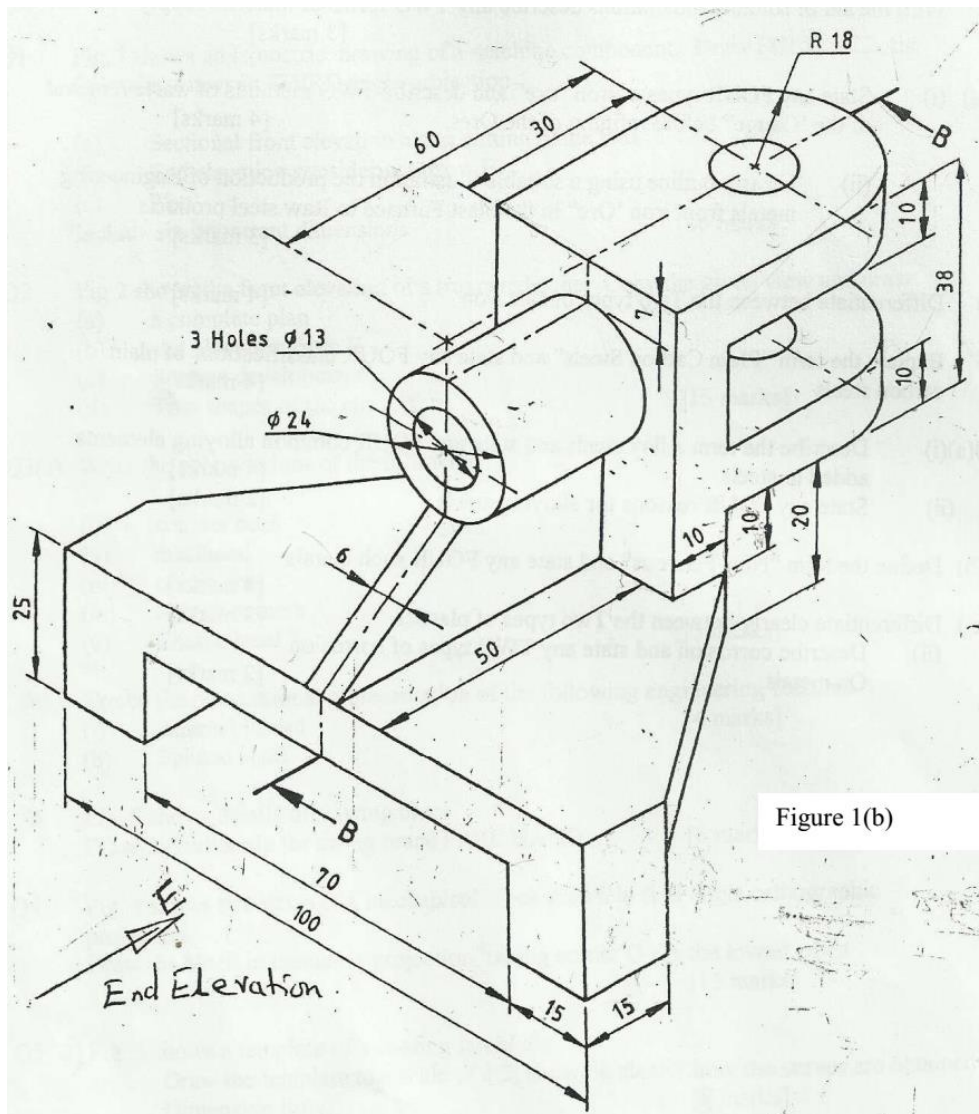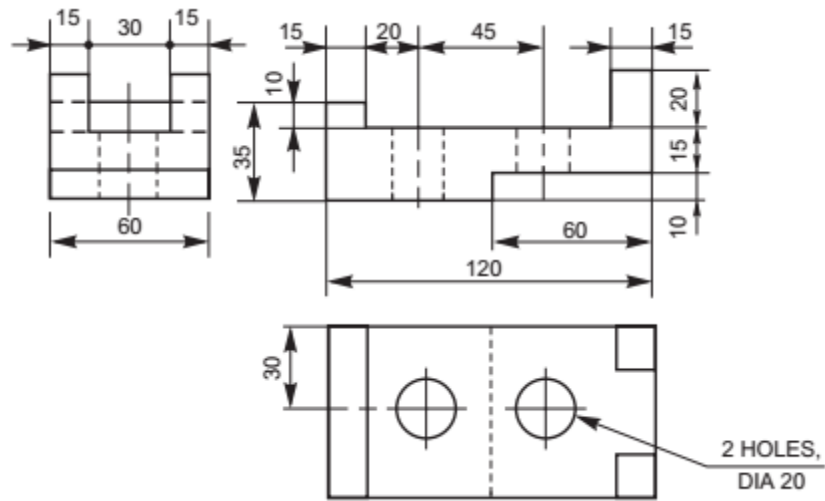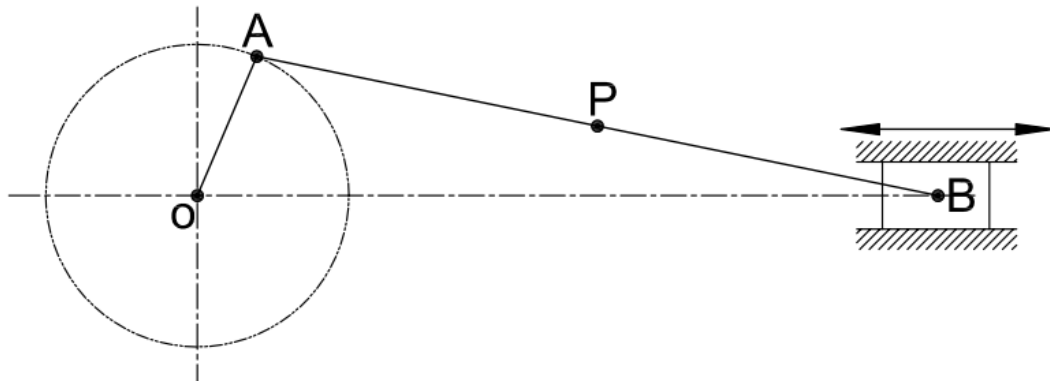
Figure 1(a)

Figure 1(b)

Figure 2

Figure 3

Figure 5