



## TECHNICAL UNIVERSITY OF MOMBASA

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**Faculty of Engineering and Technology**  
**Department of Electrical & Electronics engineering**  
**UNIVERSITY EXAMINATION FOR:**  
**BTech. Electrical & Electronics Engineering**  
**EME 4101 : Engineering Drawing**  
**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.**

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### **Question ONE**

- (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)
- a) 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 full sectional front elevation in the direction shown by the arrow.
  - (ii) A plan in projection with the front.
  - (iii) An end elevation.

Add all the necessary dimensions.

(24 Marks)

### **Question TWO**

Figure 2 shows two orthographic views of an object drawn in first angle projection. From the views, draw in full size the isometric view of the object with the corner marked A as the lowest point on the drawing. No dimensioning is required. (20 Marks)

### Question THREE

- (a) Figure 3(a) shows two views of a certain component drawn in third angle projection. Make an oblique drawing of the component in cabinet projection. (10 Marks)
- (b) Figure 3(b) shows two views of an object drawn in third angle projection. Make an oblique drawing of the object in cabinet projection. (10 Marks)

### Question FOUR

- (a) Construct a regular heptagon whose side length is 40 mm. (6 Marks)
- (b) A circle of 40 mm diameter rolls, without slipping, along the inside and outside of a circular whose diameter is 150 mm. Trace the locus of a point on the circumference of the rolling circle for one complete revolution in each case. Name the loci. (14 Marks)

### Question FIVE

Plot the cam profile which meets the following specifications:

Shaft diameter = 20mm

Minimum cam diameter = 50 mm

#### Performance:

0 – 90°, 20mm rise with uniform velocity.

90° – 180°, 30mm rise with simple harmonic motion.

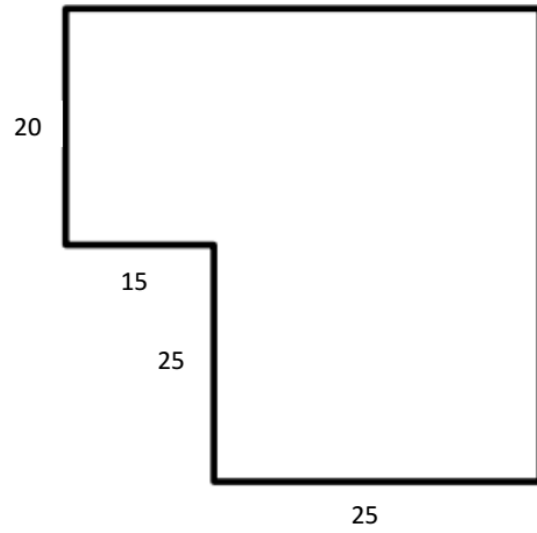
180° – 270°, dwell period.

270° – 315°, 20mm fall with uniform acceleration.

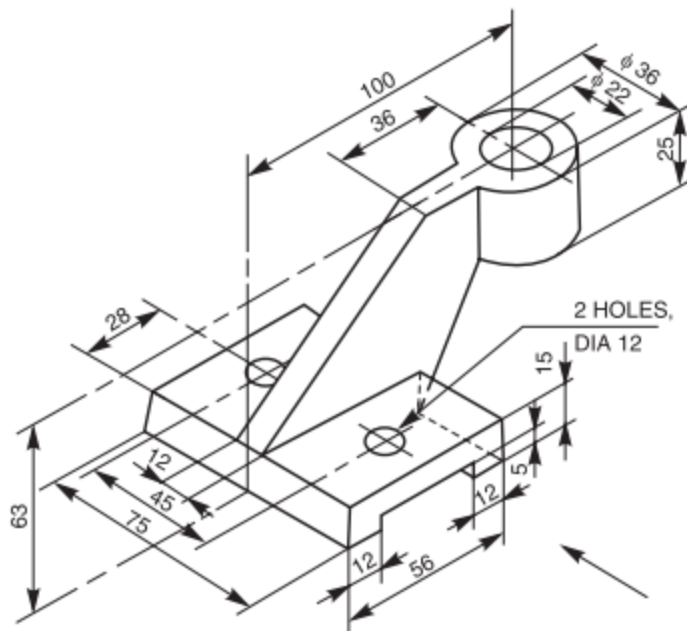
315° – 360°, 30mm fall with uniform retardation.

Take rotation of cam to be clockwise.

(20 Marks)



**Figure 1(a)**



**Figure 1(b)**

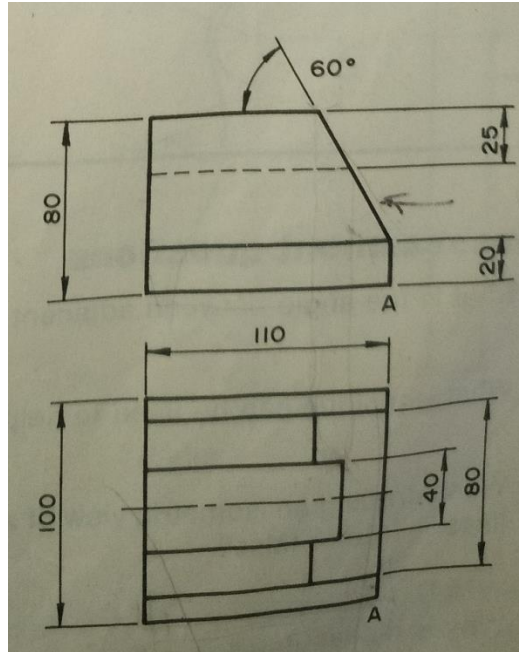


Figure 2

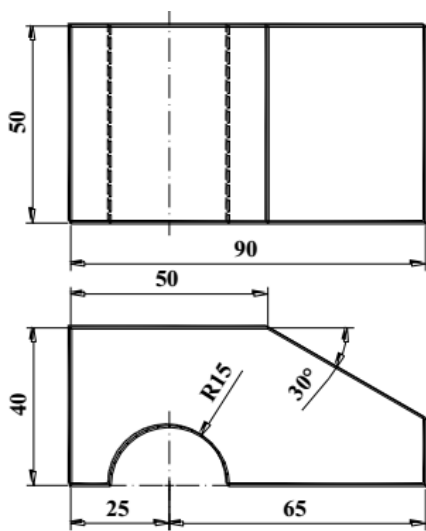


Figure 3(a)

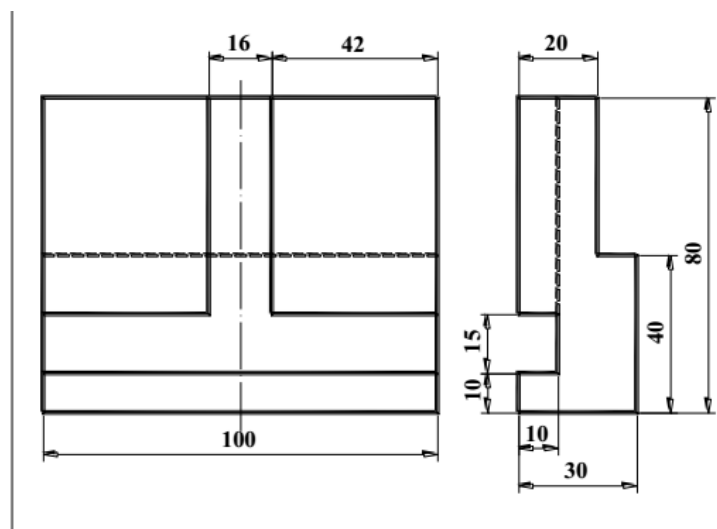


Figure 3(b)