



## THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A CONSTITUENT COLLEGE OF JKUAT)

*Faculty of Engineering and Technology*

**ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT**

BEng. Electrical Engineering & *BSc. Electrical Engineering*

### EME 2101 ENGINEERING DRAWING I

*YEAR 1 SEMESTER II EXAM*

*SERIES: MARCH, 2012*

*TIME: 2 HOURS*

#### INSTRUCTIONS TO CANDIDATES

You should have the following for this examination

- Answer booklet
- Scientific calculator
- Drawing instruments

This paper consists of FIVE questions

Question 1 is compulsory

Answer any other TWO questions.

Maximum marks per each question are shown.

This paper consists of FOUR printed pages

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#### QUESTION 1 (COMPULSARY)

a) Construct an ellipse major diameter = 90mm minor diameter = 45mm using the rectangular method

**(8 marks)**

b) i) Two circles 30mm and 20mm diameter respectively have their centers 90mm apart, for the two circles construct

- I. Internal tangent
  - II. External tangent
- (6 marks)**

ii) Construct a pentagon inscribed within a circle of diameter 50mm  
**(8 marks)**

c) Construct the template shown in figure 4 showing all the construction details  
**(8 marks)**

#### QUESTION 2

Figure 2 shows the orthographic views of a machined block. Draw the block in isometric projection. Take corner A as the lowest corner  
**(20 marks)**

#### QUESTION 3

Figure 3 shows a link mechanism where crank OA rotates about a fixed center O and causes crank CB to oscillate about fixed center C, through the connecting link XABY. Plot the loci of point X and Y when;

OA= 38mm  
AB=98mm  
BX=25mm  
BC=60mm  
AX=20mm

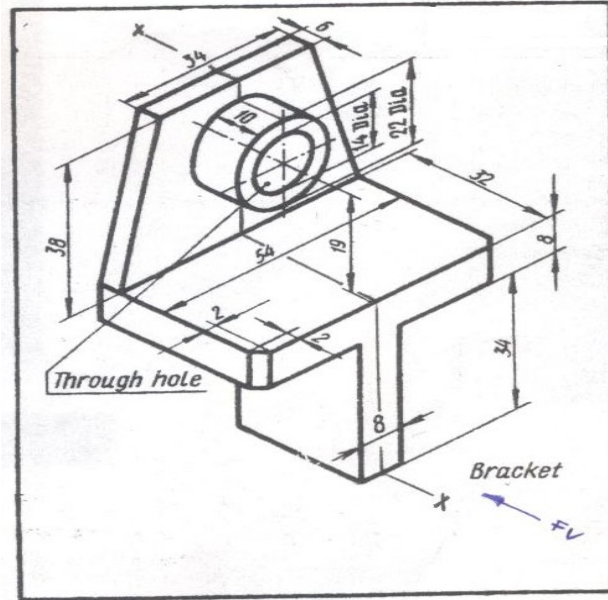
**(20 marks)**

#### QUESTION 4

Figure 1 below shows a machine component .draw full size the following views in first angle projection.

- i. Front elevation
- ii. A sectional side elevation along X-X
- iii. The plan view

**(20 marks)**



**Fig 1**

**QUESTION 5**

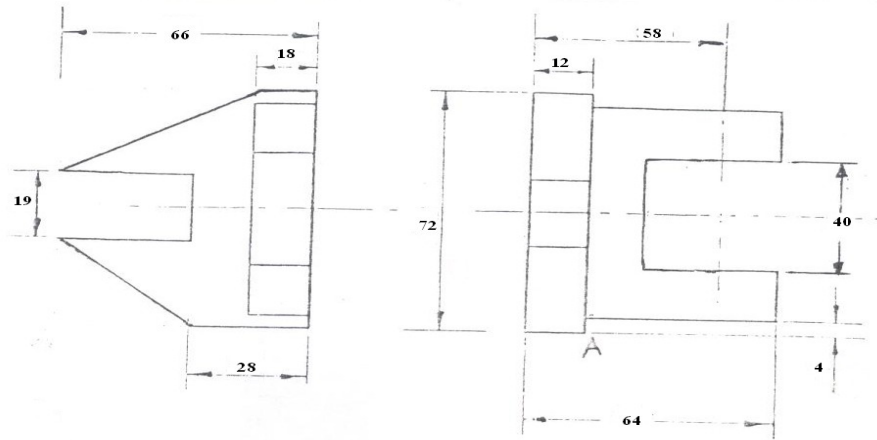
Design a cam to perform the following operations in one complete revolution

- $0^{\circ}$  - $90^{\circ}$  Simple harmonic motion rise of 50mm
- $90^{\circ}$  -  $150^{\circ}$  Dwell
- $150^{\circ}$  - $240^{\circ}$  Uniform velocity fall of 30mm
- $210^{\circ}$  - $270^{\circ}$  Dwell
- $270^{\circ}$  - $360^{\circ}$  Uniform deceleration fall of 20mm

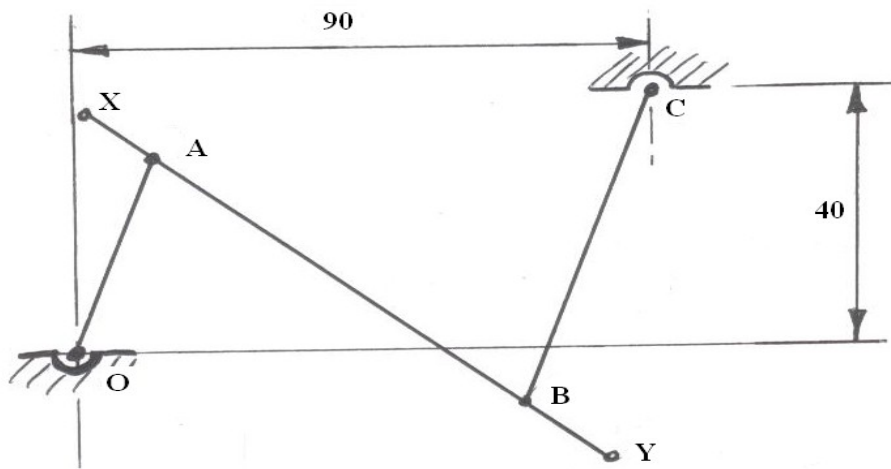
Cam details;

- (i). Shaft diameter = 20mm
- (ii). minimum cam radius = 30mm
- (iii). knife edge follower
- (iv). rotation anticlockwise

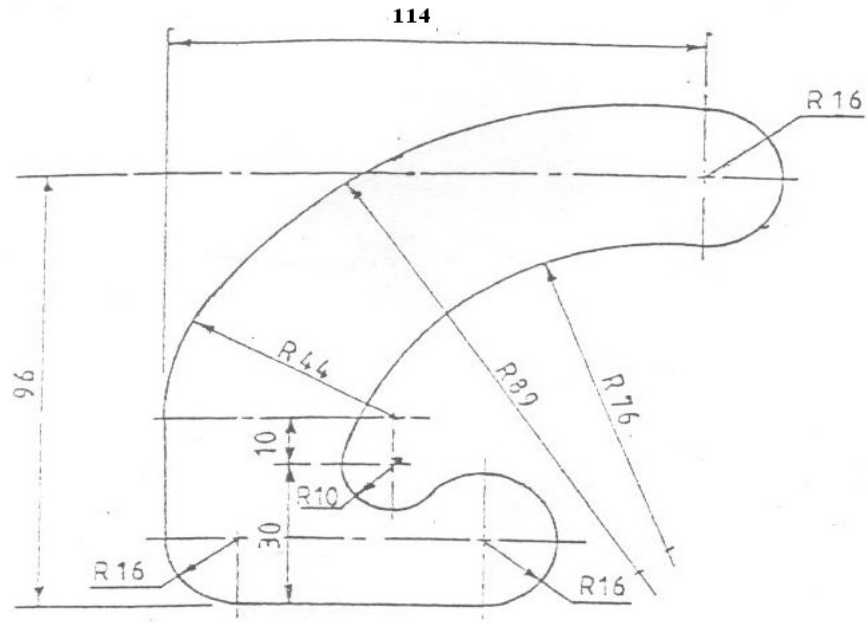
**(20 marks)**



**Fig 2**



**Fig 3**



**Fig 4**