



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL AND MANUFACTURING ENGINEERING

SECOND YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

EMM 200: COMPUTER AIDED DRAWING AND DESIGN

DATE: 26/9/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS:

- I. This paper contains **FIVE (5)** questions. Question (1) in **section 1** is compulsory and carries 30 marks. All the other questions carry 20 marks each.
- II. Attempt **Question one** and any other two: one from **Section B** and another one from **Section C**
- III. You need a computer installed with AutoCAD 2016.
- IV. Create a folder on the desktop and rename it your Registration Number. Save your work progressively in the renamed folder.
- V. All dimensions are in millimetres unless otherwise stated.
- VI. Unspecified dimensions are to be taken as per choice

SECTION A: COMPULSORY

QUESTION ONE (30 MARKS)

Fig. Q1 shows orthographic views of a component. Using AutoCAD 2016;

- a) Draw the solid geometry and generate from it; the **full sectional front view, a plan, end elevation** (in 3rd Angle Orthographic projection) and the **isometric view** in paper space. (16 Marks)
- b) Indicate 10 main dimensions. (5 Marks)
- c) Use layers to group the lines according to their functions. (5 Marks)
- d) Suitable Border line and Title block (4 Marks)

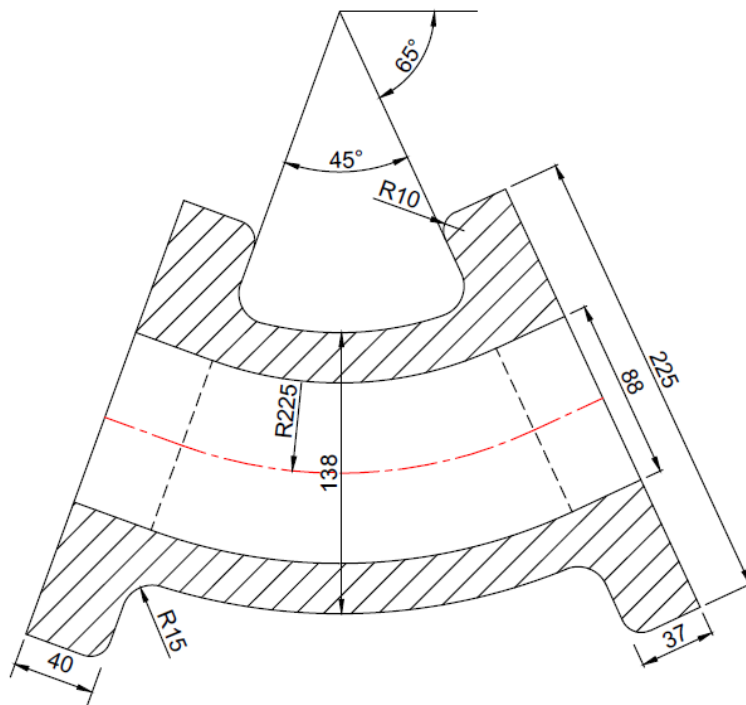
SECTION B: ANSWER ANY ONE

QUESTIONS TWO (20 MARKS)

- a) Describe the following types of 3-D modelling techniques. Cite an example of its application, advantages and disadvantages for each.
- i. Solid modelling (5 Marks)
 - ii. Surface modelling (5 Marks)
- a) Define Layers as used in computer aided design (2 Marks)
- b) Define hatching as used in sectional views (2 Marks)
- b) Using diagrams, describe the functions of the following 3-D modelling tools
- i. Revolve tool (2 Mark)
 - ii. Lofting tool (2 Mark)
 - iii. Sweep tool (2 Mark)

QUESTIONS THREE (20 MARKS)

- a) Describe the functions of the following tools in CAD.
- i. Array tool (2 Marks)
 - ii. Offset tool (2 Marks)
- b) Outline the steps utilised in constructing the object in the figure below (6 Marks)



- c) Discuss in details the three main components of a CAD system (10 Marks)

SECTION C: ANSWER ANY ONE

QUESTION 4 (20 MARKS)

Fig. Q4 shows an isometric view of a solid object, the **arrow** indicates the direction to obtain the front view. Using AutoCAD 2016 and in **Third Angle Orthographic Projection** draw the following views and present them in paper space;

- a) The front view (6 Marks)
- b) Plan (5 Marks)
- c) Use layers to group lines according to function, (4 Marks)
- d) Include **6** major dimensions in paper space. (3 Marks)
- e) Suitable title block. (2 Marks)

QUESTION 5 (20 MARKS)

Fig. Q5 shows an isometric view of a solid object, the **arrow** indicates the direction to obtain the front view. Using AutoCAD 2016 and in **First Angle Orthographic Projection** draw the following views and present them in paper space;

- a) The front view (6 Marks)
- b) End/Side view (5 Marks)
- c) Use layers to group lines according to function, (4 Marks)
- d) Include **6** major dimensions in paper space. (3 Marks)
- e) Suitable title block. (2 Marks)

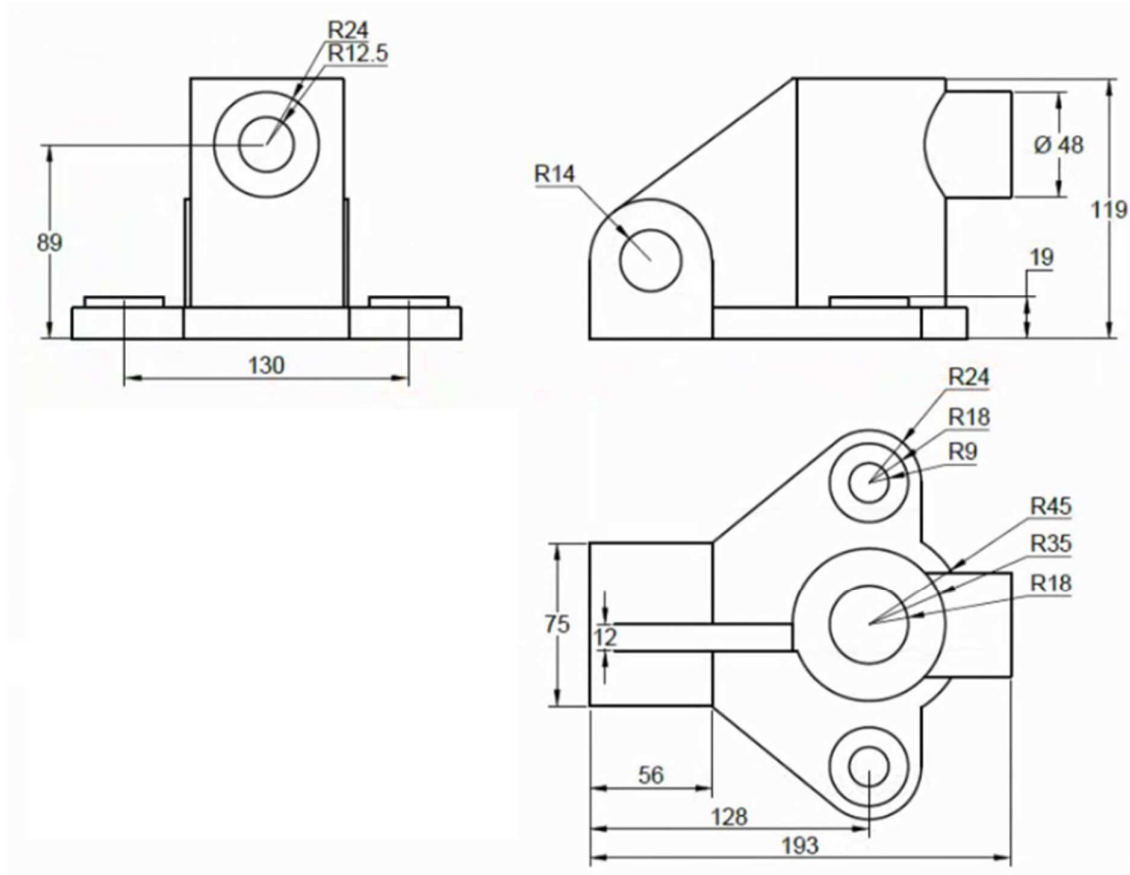


Fig Q1

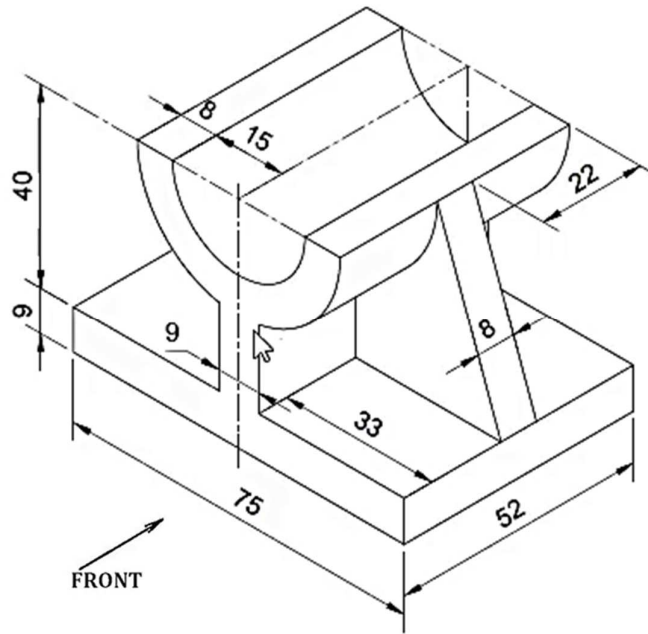


Fig Q4

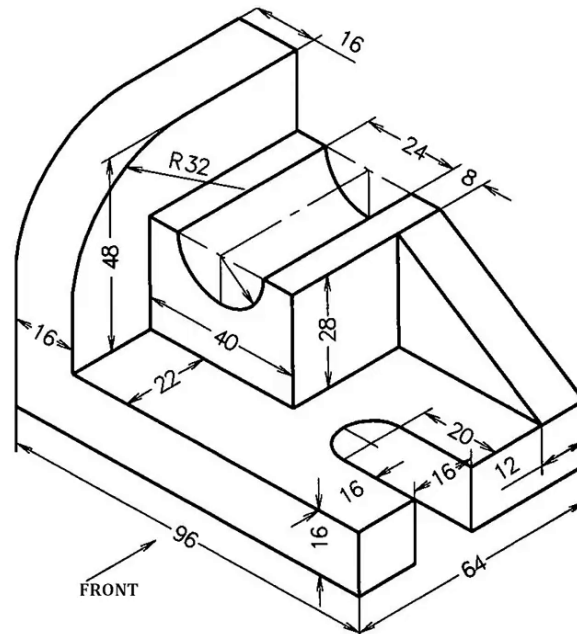


Fig Q5