THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A CONSTITUENT COLLEGE OF JKUAT)

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION 2010/2011

FIRST YEAR SECOND SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN ELECTRICAL & ELECTRONIC ENGINEERING

EME 2113

ENGINEERING DRAWING AND DESIGN II

TIME: 2 HOURS **SERIES:** MARCH, 2012

INSTRUCTIONS TO CANDIDATES

1. You are required to have the following for these examinations:
   - Answer Booklet

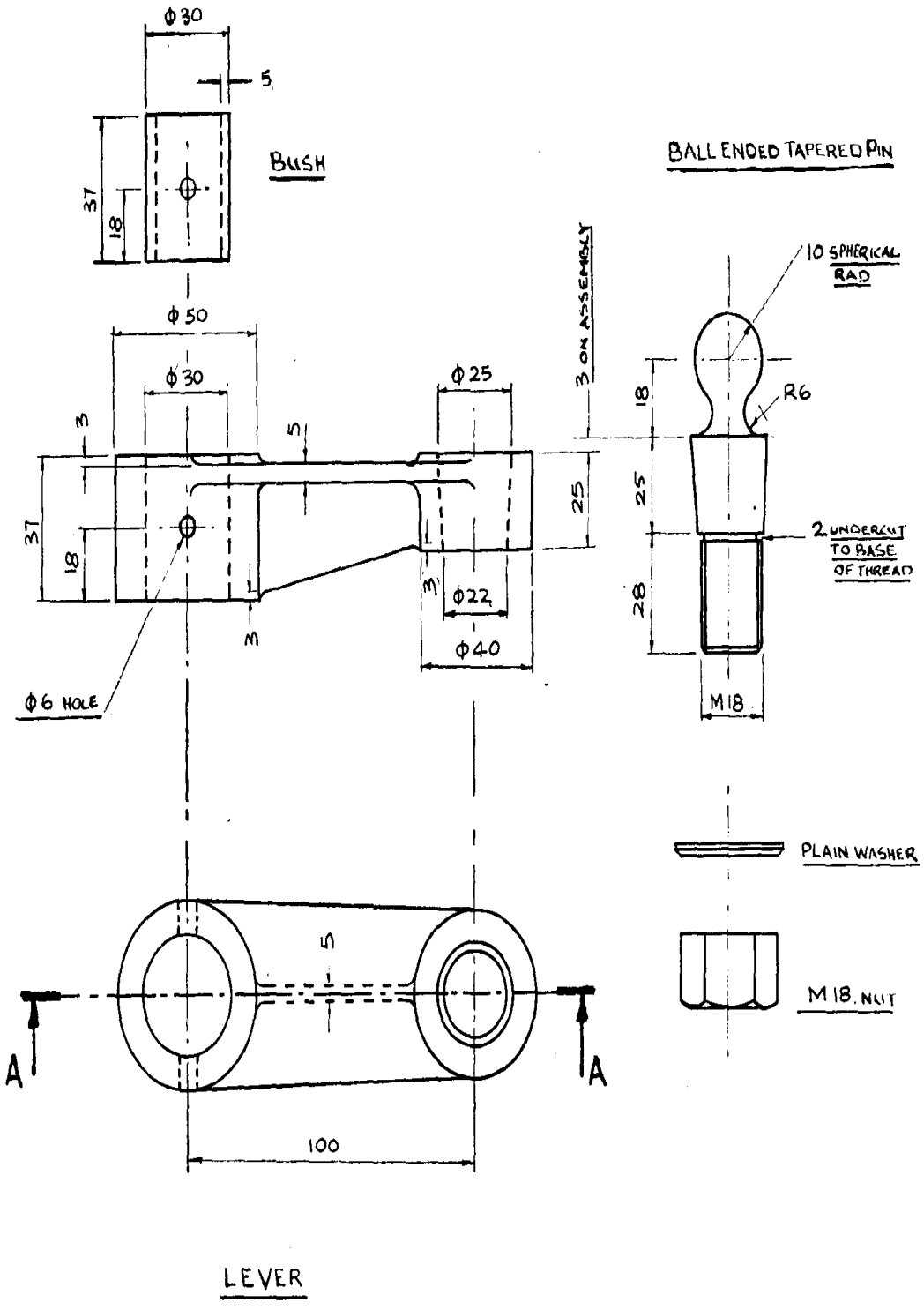
2. This paper has **FIVE** Questions.
3. Answer Question **ONE** and any other **TWO** Questions.
4. All questions carry equal marks.
5. This paper consists of ***Four Printed pages.***

QUESTION ONE: ASSEMBLY DRAWING
[COMPULSORY, 30 MARKS]

Fig 1 below shows the parts of a mechanical component. Assemble the parts and draw in first angle projection the following:

a) A sectional front elevation on the cutting plane A-A **[10 marks]**
b) The end elevation **[6 marks]**
c) The plan **[6 marks]**

d) Insert at least eight dimensions **[4 marks]**
e) Tabulate a parts list **[4 marks]**

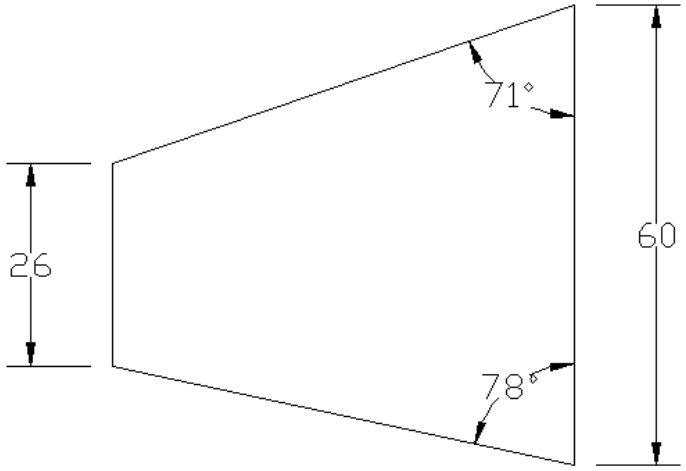


f)

Figure1

QUESTION TWO [20 marks]

a) Figure 2 below shows the elevation of a truncated cylinder of diameter 60mm and height 60mm. Draw the pattern development for the elevation. **[15 marks]**



b) Sketch the following fastening devices **[5 marks]**

i. Bolt
ii. Nut
iii. Stud
iv. Splined shaft
v. Rivet

Figure 2

QUESTION THREE [20 marks]

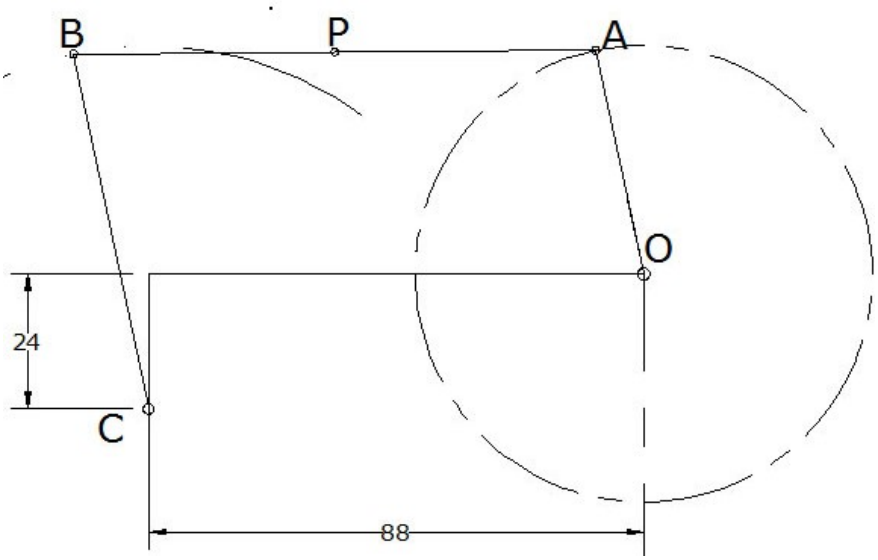


Figure3

Figure 3 shows crank OA, which 40mm long, rotates about fixed center O and causes crank CB to oscillate about fixed center C through the connecting link AB. The mechanism is pin jointed at A and B, and AB= 80mm and BC =60mm. Plot the locus of P for one complete revolution of OA. **[14 marks]**

QUESTION FOUR: LIMITS & FITS [20 marks]

Use the BS 4500 Table provides to answer this question

a) Illustrate with diagrams four types of errors in geometrical tolerances **[4 marks]**

b) Illustrate with the diagrams the following types of fits **[8 marks]**

i. Clearance Fit
ii. Transition Fit
iii. Interference Fit

b) Define the maximum and minimum limits of size, for the hole and shaft, in the following mating systems **[8 marks]**

i. 65mm H8/f7
ii. 220mm H7/p6
iii. 12.5mm H7/k6

QUESTION FIVE: GEARS [20 marks]

A pinion has 20 teeth and meshes with a rack. If the module is 10 and pressure angle 20 degrees, draw two teeth of pinion meshing with three teeth or rack **[20 marks]**