KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2009/2010

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION & COMMUNICATION TECHNOLOGY

SCE 115: ENGINEERING DRAWING & DESIGN I

DATE: WEDNESDAY, 28TH JULY 2010 **TIME: 11.00 A.M. - 1.00 P.M.**

INSTRUCTIONS

(i) This paper contains **FIVE (5)** questions.

(ii) You are required to answer **THREE (3)** questions only.

(iii) Question **one** is compulsory.

(iv) Attempt any other two questions.

(v) Question one carries 30 marks and the others carry 20 marks each.

(vi) Construction lines should be faint and should not be erased.

(vii) All dimensions are in millimeters unless otherwise stated.

(viii) Missing and mismatching dimensions, if any, may be suitably assumed.

Question 1 (COMPULSORY)

A casting detail is shown by a pictorial view in Figure Q1. Draw, to a suitable scale, the following views in 3rd angle orthographic projection, with all hidden details except in end view :

(a) A front elevation obtained by viewing the detail in the direction of arrow F. (8 marks)

(b) A plan view projected from the front elevation. (6 marks)

(c) An end view (without hidden detail) obtained by viewing the detail in the direction of arrow E (6 marks)

(d) Insert four dimensions (a diameter, a radius, a short and a long length) (2 marks)

(e) The projection symbol according to standard drawing conventions (2 marks)

(f) A suitable title block (6 marks)

Question 2

(a) Fig. Q2(a) shows two orthographic views, i.e front view and plan, of a bracket drawn in 3rd angle. Study the given views and construct using a suitable scale the an oblique (Cavalier) drawing of the bracket with face "F" towards the front. (9 marks)

(b) Fig. Q2(b) shows 2 views of a machined block drawn in 1st angle projection. Draw to a suitable scale an isometric view of the block making corner A the lowest point. (11 marks)

Question 3

Draw the graph and profile of a cam with the following specification:
Plate cam, rotating anticlockwise. Point follower. Least radius of cam, 30 mm. Camshaft diameter, 20 mm.
$0\text{-}90^0$, follower rises 20 mm with uniform velocity.
$90^0\text{-}150^0$, follower rises 30 mm with simple harmonic motion.
$150^0\text{-}210^0$, dwell period.
$210^0\text{-}270^0$, follower falls 20 mm with uniform acceleration.
$270^0\text{-}360^0$, follower falls 30 mm with uniform retardation.

(20 marks)

Question 4

(a) The views in Fig. Q4(a) represent two discs which roll along AB. Both discs start at the same point and roll in the same direction. Plot the curves for the movement of points p and q and state the perpendicular height of p above AB where q again coincides with the line AB. (13 marks)

(b) Fig. Q4(b) shows a crank OA which revolves in clockwise direction around pivot O. Link AB is pin – jointed at A and end B always slides along the horizontal line CD. Plot the locus of point P on the line for one revolution of OA.

(7 marks)

Question 5

Sketch freehand the isometric blocks represented by the orthographic views in fig. Q5 and draw the views missing in spaces shown. Show hidden detail where applicable.

(20 marks)

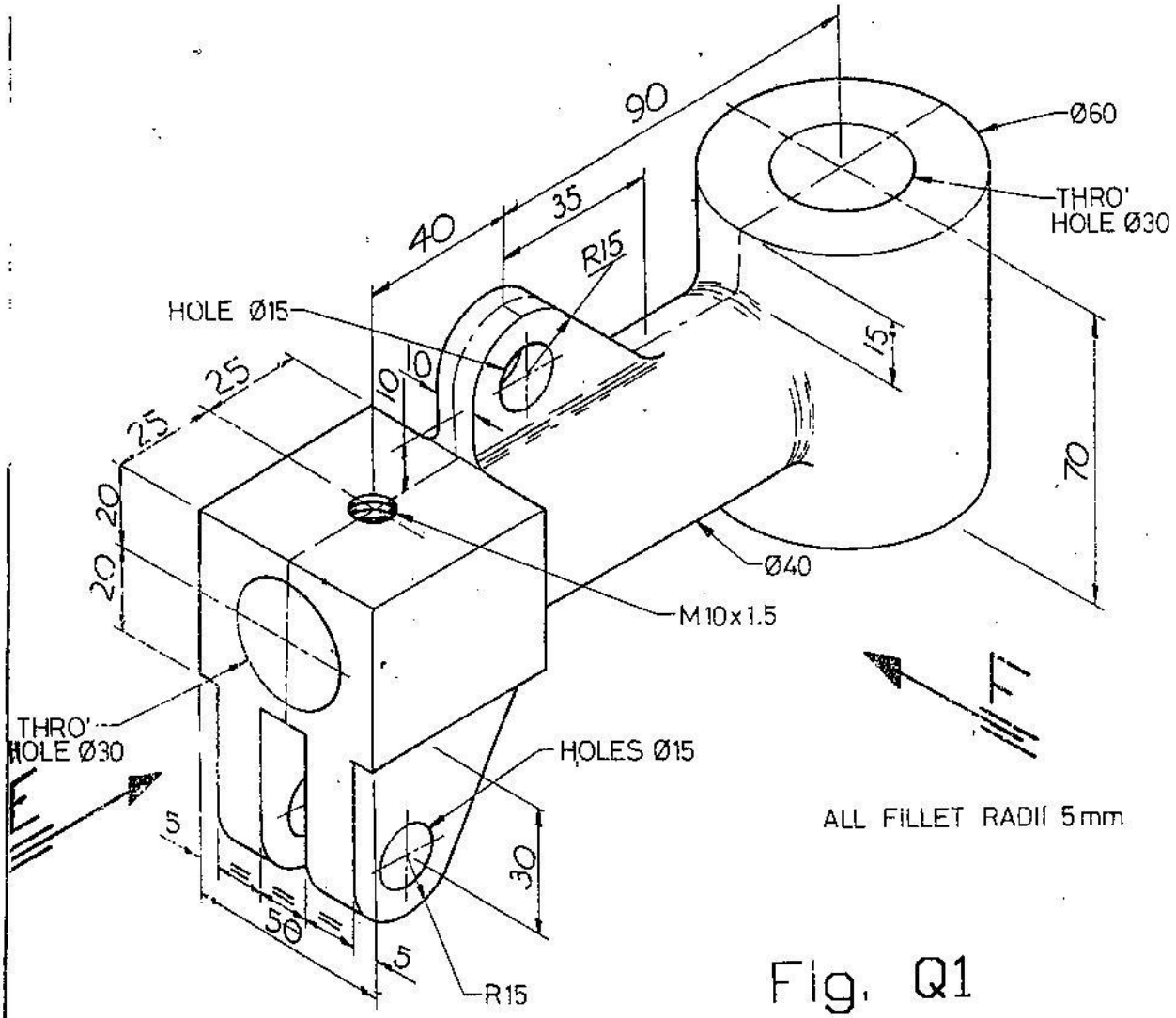
90
40
35
R15
Ø60
THRO'
HOLE Ø30
HOLE Ø15
25
25
10
10
15
70
20
20
Ø40
M10x1.5
THRO'
HOLE Ø30
HOLES Ø15
5
30
50
5
R15
ALL FILLET RADII 5mm

Fig. Q1

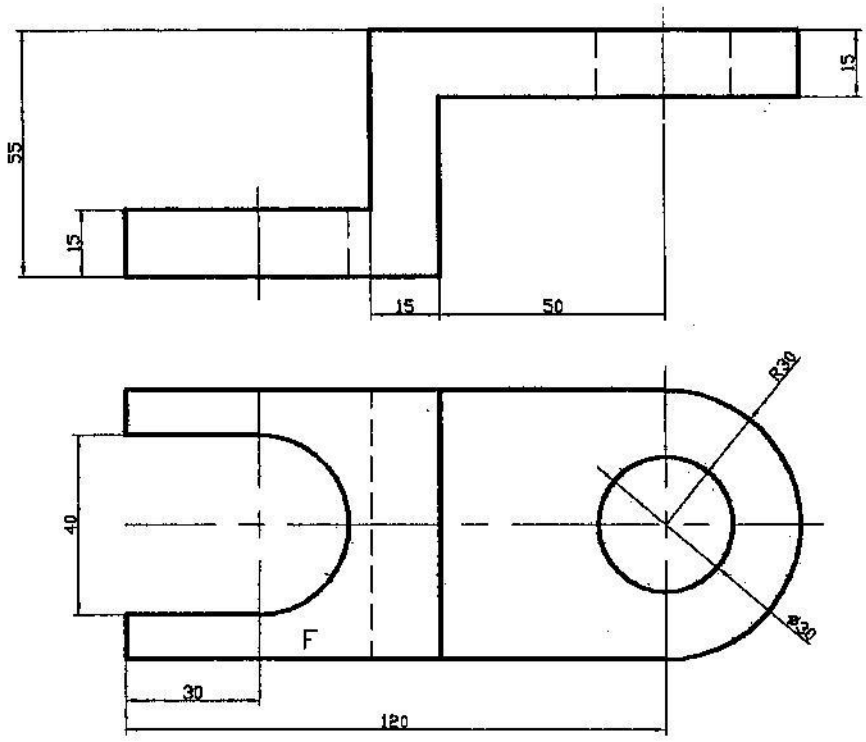

Fig. Q2(a)

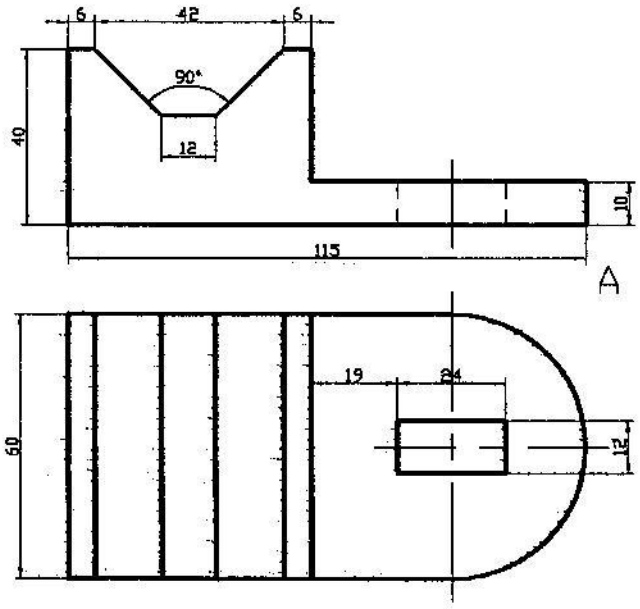

Fig. Q2(b)

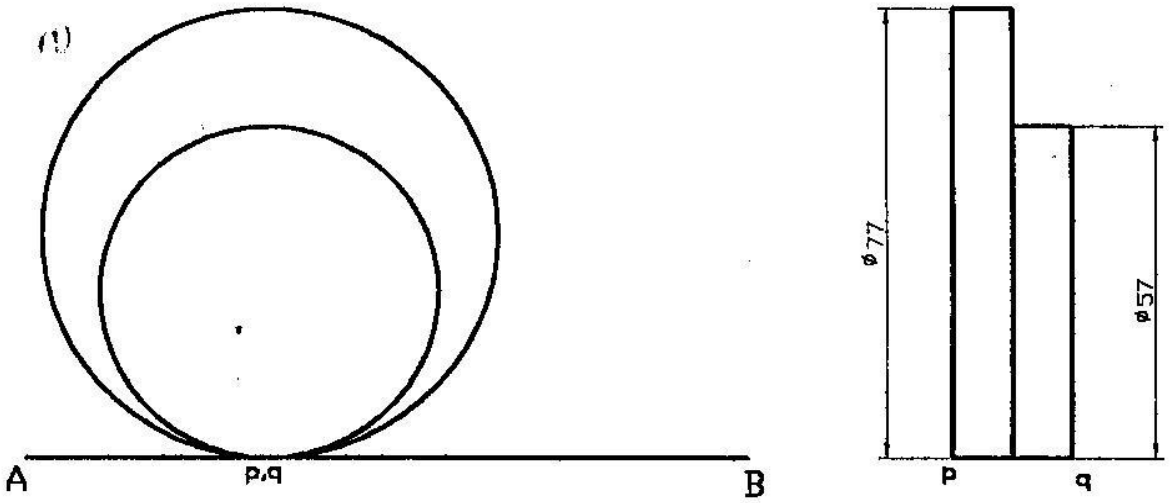

Fig. Q4(a)

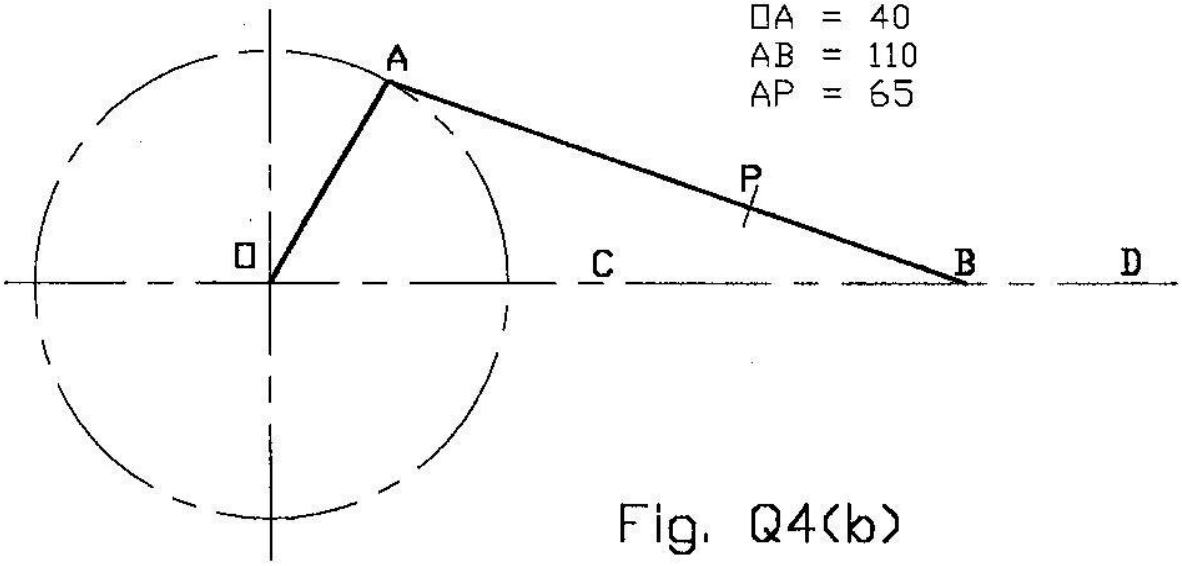

Fig. Q4(b)

Fig. Q5