THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)
Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN BUILDING & CIVIL ENGINEERING

ECE 2216: ENGINEERING DRAWING IV

[COMPUTER AIDED DRAUGHTING]

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011
TIME: 2 HOURS

SECTION A (COMPULSORY)

Question 1 (30 marks)

a) When one starts an AutoCAD session, the screen that greets one is called the AutoCAD User Interface.
  (i)   List **THREE** ways of entering commands on the AutoCAD interface   (2 marks)
  (ii)   What is the central area on the AutoCAD interface called?   (1 marks)
  (iii)   AutoCAD often prompts us to select object. Give THREE ways of selecting objects on the AutoCAD user interface   (3 marks)

b) Sketch the following Architectural symbols
  (i)   Double bed   (3 marks)
  (ii)   Cooker   (3 marks)

(iii) Bath   (2 marks)

c) List **THREE** important features that a structural drawing must have   (3 marks)

d) Explain the working of the following AutoCAD commands
    (i)   Chamfer   (6 marks)
    (ii) Trim   (3 marks)

SECTION B (Answer any TWO questions from this section)

Question 2 (20 marks)

a) When drawing with AutoCAD you can create copies of objects in a rectangular or polar (circular) array. Outline the procedure of creating a polar array   (7 marks)

b) An interior column in a building supports two suspended floors. The column is made of reinforced concrete and stands on pad footing 1600 x 1600mm in plan and 400mm deep. The column has a section of 400 x 200mm and the floor height is 3000mm. the reinforcement from foundation to first floor is 4Y25 + 2Y16 and that from first floor to second floor is 4Y20 + 2Y16. Shear links may be taken as Y8@150 throughout the column. The reinforcement to the pad footing is Y16@150 each way. Make a detailed drawing of the column and the pad footing. Assume all slabs are 150mm deep and floor beams are 450 x 200mm each day.   (13 marks)

Question 3 (20 marks)

a) In AutoCAD, layers are like transparent overlays on which you organize and group different kinds of drawing information, i.e. layers are used to group information in drawing by function and to enforce line type, colour, and other standards. Explain the procedure of creating a new layer.   (4 marks)

b) Explain how you will offset an object in AutoCAD by specifying a distance   (5 marks)

c) A two span reinforced concrete beam is 450 x 200mm in section. The first span is 4.5m long and reinforced with 2Y16 + 1Y12 bars at the bottom. The second span is 6.0m long reinforced with 2Y20 bars. The support reinforcement is 2Y20 + 1Y16. Make a detailed drawing of the beam assuming a 150mm floor slab and 450 x 200 cross beams. Assume columns are 250 x 250mm and the shear links are Y8@200 throughout the beam   (11 marks)

Question 4   (20 marks)

a) Explain the working of the following AutoCAD commands
    (i)   Move (using displacement)   (4 marks)
    (ii) Copy   (4 marks)

b) A 150mm reinforced concrete suspended slab supporting water tanks is supported on 450 x 200mm beam which are in turn resting on an array of 200 x 200 columns. The slab is 6.2m wide in the y- direction with the beams spaced at 3.0m centres and 8.2m in the x-direction with beams spaced at 4.0m centres. The main reinforcement is Y10@200 both at supports and mid span and

the secondary reinforcement is Y10@250 distribution steel at supports. All columns fall at beam intersections. Make a detailed drawing of the slab (12 marks)

Question Five (20 marks)

a) When you specify an object snap, the cursor changes to an object snap target box. For example the target box for "Intersection" is a cross or X. What are the target boxes for the following object snaps?
   - End point?
   - Mid point?
   - Centre?
   - Quadrant?
   - Perpendicular? (5 marks)

b) If you need to use the same object snap repeatedly,, you can set it up as a running object snap, which means it stays on until you set it off. For example, you might set Centre as a running object snap if you need to connect to the centres of a series of circles with a line. However, there are instances when the point you wish to snap onto is not set as a running object snap. Outline the procedure of snapping onto a geometric point on an object (5 marks)

c) What are the **TWO** ways of turning the on and off running object snaps as you work? (2 marks)

d) For most low rise buildings e.g. bungalows the foundations are usually strip footings with nominal reinforcement. Draw typical cross-sections for the strip footing on an exterior and internal wall. Assume the footings are 600 x 200 mm deep with nominal reinforcement (8 marks)