2705/105
2707/105
2709/105
BUILDING CONSTRUCTION I TECHINICAL
DRAWING AND CONSTRUCTION PLANT
June/July 2022
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN BUILDING TECHNOLOGY
DIPLOMA IN CIVIL ENGINEERING
DIPLOMA IN ARCHITECTURE

MODULE I

BUILDING CONSTRUCTION I, TECHNICAL DRAWING AND CONSTRUCTION PLANT

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:
- *Answer booklet;*
- *Drawing instruments;*
- *Drawing paper size A3.*

*This paper consists of **EIGHT** questions in **THREE** sections; **A**, **B** and **C**.*
*Answer **FIVE** questions choosing **TWO** questions from section **A**, **TWO** questions from section **B** and **ONE** question from section **C** in the answer booklet provided.*
All questions carry equal marks.
Maximum marks for each part of a question are as indicated.
Candidates should answer the questions in English.

This paper consists of 7 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A: BUILDING CONSTRUCTION I

*Answer **TWO** questions from this section.*

1. (a) With the aid of sketches, distinguish between a bevelled closer and a king closer. (4 marks)

   (b) State **two** advantages of precast concrete lintel over in site lintel. (2 marks)

   (c) State **four** reasons for timbering in an excavation. (4 marks)

   (d) Sketch timbering details in partially firm ground in pictorial view. (10 marks)

2. (a) State **six** functional requirements of walls. (6 marks)

   (b) Sketch an elevation of a timber casement window to show:

   (i) casement sash
   (ii) fixed light
   (iii) vent light
   (iv) head

   (6 marks)

   (c) With the aid of sketches, describe two ways of fixing glass in a timber window frame. (8 marks)

3. (a) With the aid of a sketch, explain the building code requirements in relation to the lap and step of a stepped strip foundations. (6 marks)

   (b) State **four** functions of hard core layer in a ground floor. (4 marks)

   (c) With the aid of a sectional sketch through a fire place, show the following:

   (i) fire back
   (ii) gathering
   (iii) throat
   (iv) flue

   (10 marks)

SECTION B: TECHNICAL DRAWING

*Answer **TWO** questions from this section.*

4. (a) Construct a triangle of perimeter 190 mm with sides in the ratio of 3 : 6 : 8.

(5 marks)

(b) **Figure** 1 shows a link work with crank OA rotating clockwise about 0 at a constant speed. Link AB is attached to rod CB which swings about C. P is a point on AB.

Plot the locus of P of one revolution of OA. **(15 marks)**

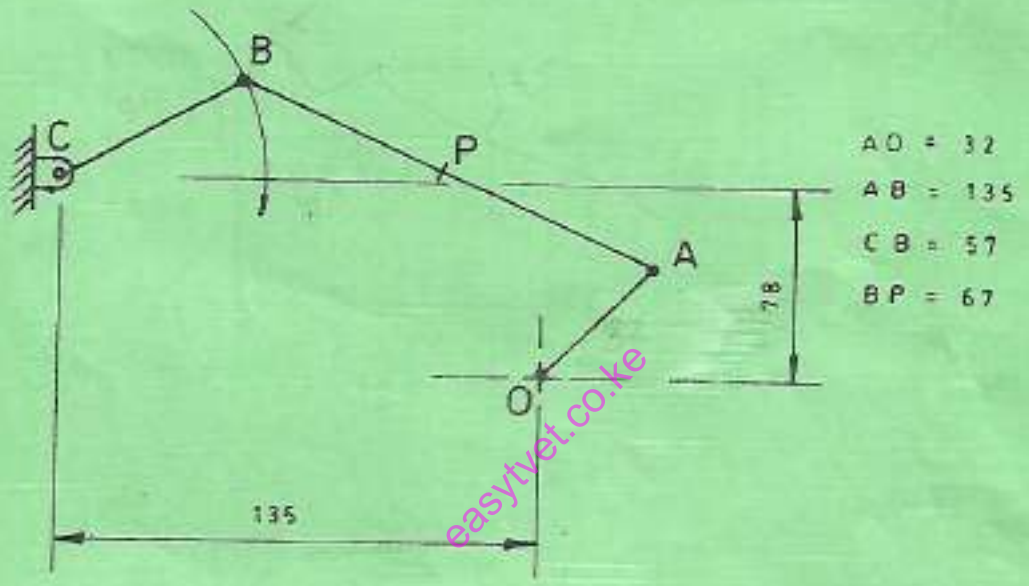

Fig. 1

5. (a) **Figure 2** shows orthographic views of a block in 1st angle projection. Make a free hand sketch of the block in isometric. (10 marks)

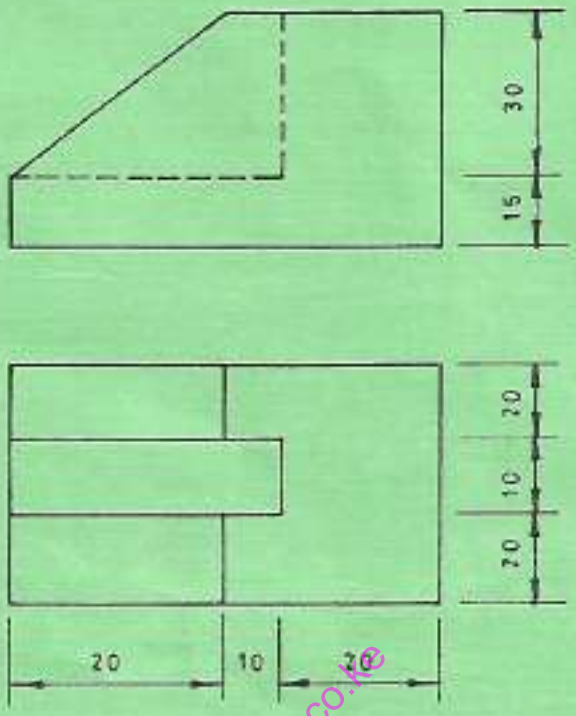

Fig. 2

(b) Draw the views of the block in **Figure 3** in 3rd angle projection. (10 marks)

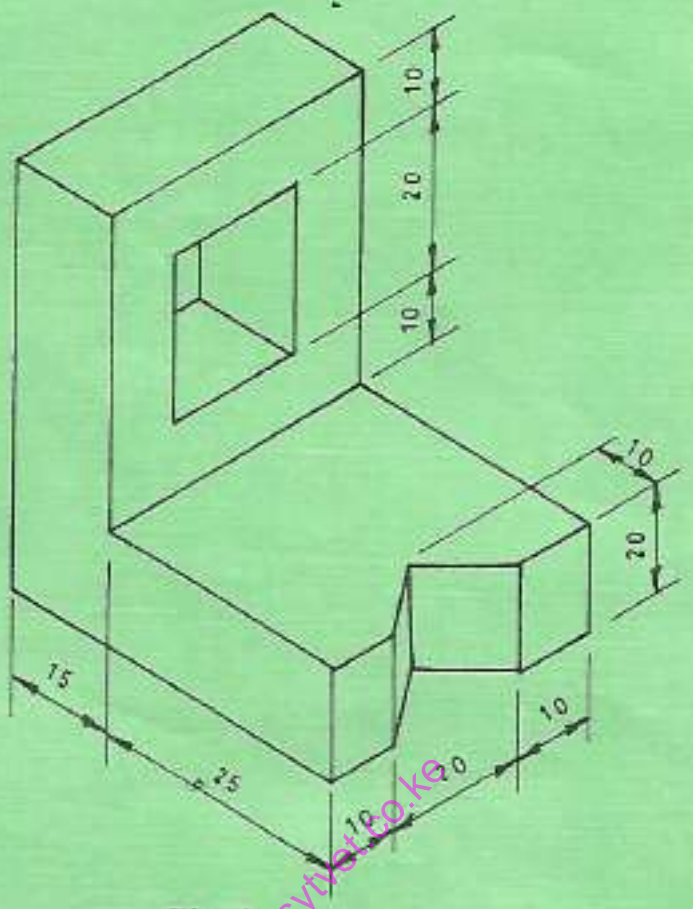

Fig. 3

6. **Figure 4** shows the views of a block in orthographic projection. Draw the block in oblique (cabinet). (20 marks)

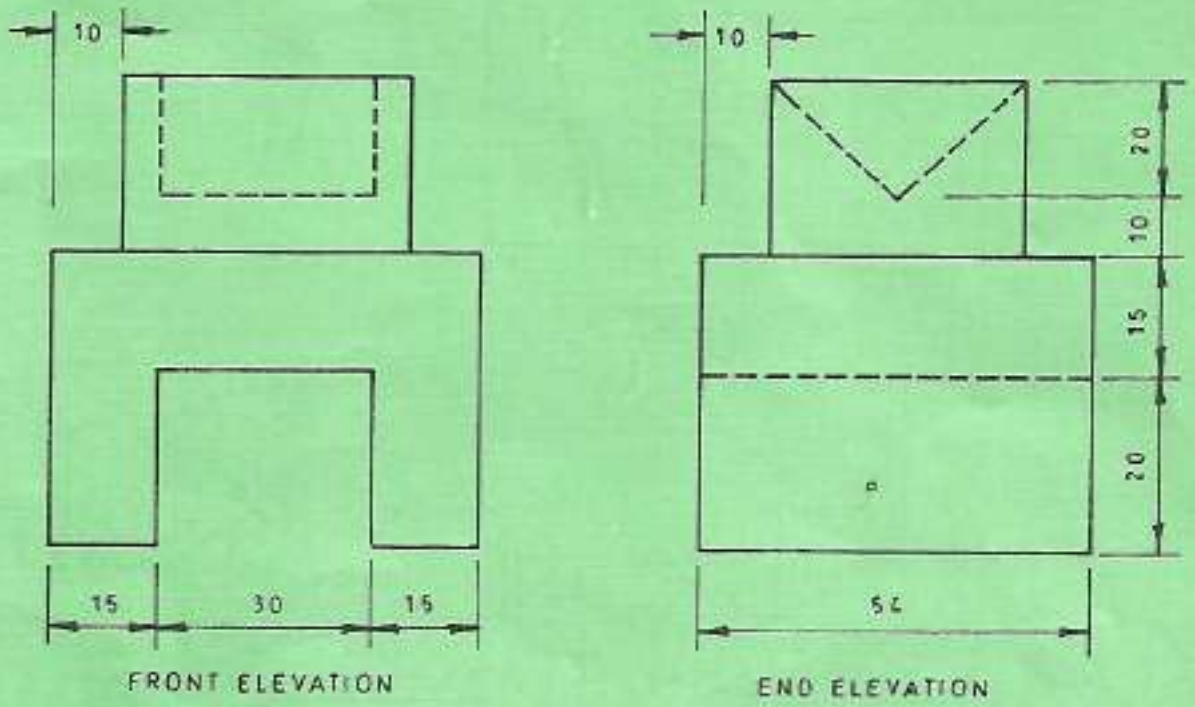

Fig. 4

SECTION C: CONSTRUCTION PLANT

*Answer **ONE** questions from this section.*

7 (a) State **four** operating principles of a floating screed paver. (4 marks)

(b) A backactor has a bucket capacity of 0.9 m^3 with an optimum rate of 25 buckets per hour. Determine the output of the machine when:

(i) task efficiency factor is 0.8;
(ii) operator efficiency factor is 0.85. (6 marks)

(c) With the aid of a sketch, describe a tamper. (10 marks)

8. (a) With the aid of a sketch, describe a tamper. (10 marks)

(b) Describe the following transporting plant:

(i) low loader;
(ii) standard dumper. (4 marks)

(c) Using the straight line method determine the hourly rate of an item of plant given:

(i) capital cost = Ksh 9,000,000;
(ii) anticipated life = 6 years
(iii) annual working time = 1600 hours
(iv) scrap value = Ksh 600,000
(v) insurance and maintenance = 12%

(6 marks)

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