2705/105
2707/105
2709/105
BUILDING CONSTRUCTION I
TECHNICAL DRAWING AND
CONSTRUCTION PLANT
June/July 2016
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 paper size A3;
Scientific calculator.
*This paper consists of **EIGHT** questions in **THREE** sections; **A, B** and **C**.*
*Answer **TWO** questions in section **A**, **TWO** questions in 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 shown.
Candidates should answer the questions in English.

This paper consists of 6 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 any TWO questions in this section.

1. (a) Define the following terms as used in setting out:

   (i) building line;
   (ii) base line;
   (iii) ranging lines. (6 marks)

   (b) With aid of sketches, outline the steps in 3:4:5 method of setting out. (9 marks)

   (c) State any **five** factors that may influence the method of excavation of foundation trenches. (5 marks)

2. (a) With aid of sketches, explain sump method of dewatering (5 marks)

   (b) Determine the width of a simple strip foundation if the total loading is 60 kN per m and the soil bearing capacity is 100 kN/m^2. (4 marks)

   (c) Sketch and label a longitudinal section through timbering in a loose wet soil. (5 marks)

   (d) Figure 1 below, is a line diagram of a sloping site. Illustrate the three methods of levelling such a site. (6 marks)

Fig. 01

3. (a) Outline any **three** functional requirements of a wall. (6 marks)

   (b) Sketch and label the construction of a ground timber floor. (5 marks)

   (c) Figure 2, below is a line diagram of a door frame. Sketch joint detail at point A. (3 marks)

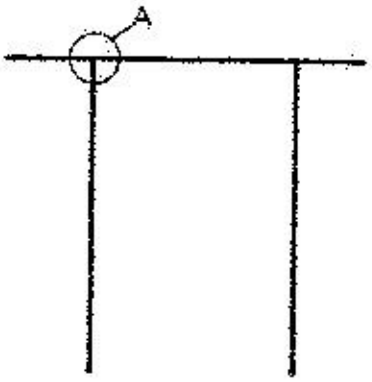

Fig. 02

(d) Figure 3, is door opening in a wall. Sketch the construction detail at point B for the following:

(i) door frame;
(ii) door lining. (6 marks)

Fig. 03

SECTION B: TECHNICAL DRAWING

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

4. Figure 4 shows an isometric drawing of a block. Using first angle orthographic projection, draw:

(i) the plan;
(ii) the front elevation;
(iii) the side elevation. (20 marks)

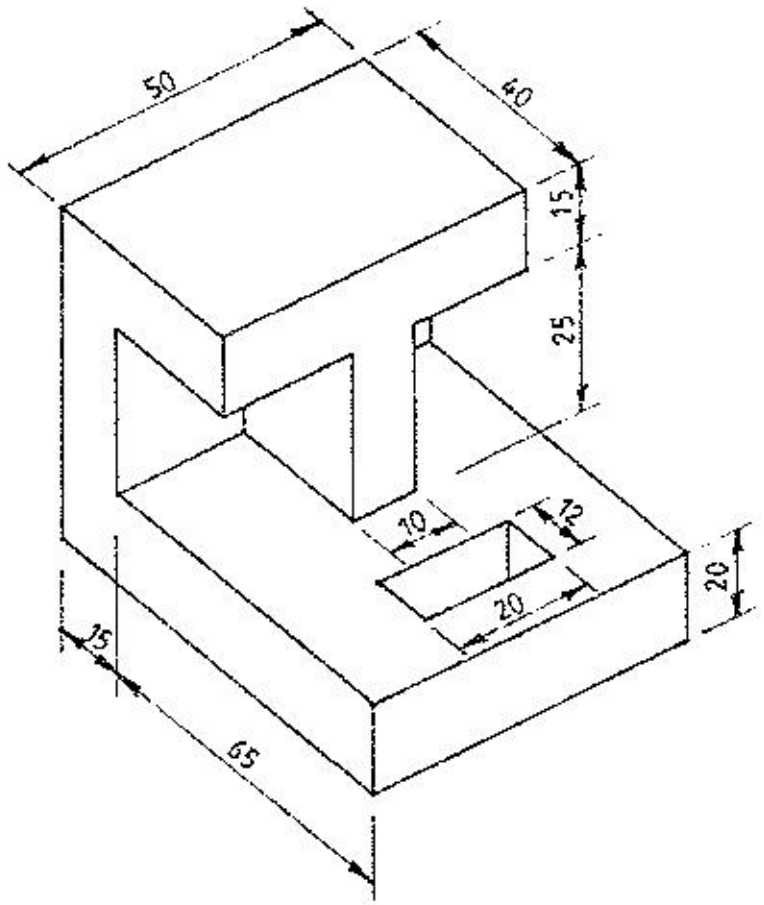

Fig.04

5. Figure 5 shows a machine arm OA rotating in a full circle, clockwise about its end O. The link AB is pivoted at A to AO, the end B of AB is constrained to move by slider in a straight line along OC. Construct the locus of point P on AB. (20 marks)

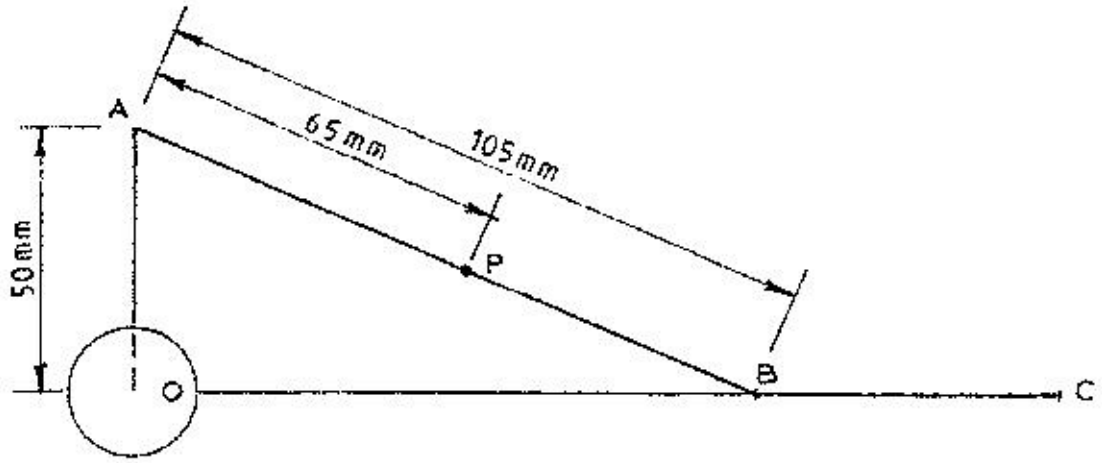

Fig. 05

6. Figure 6 shows the elevation of a truncated square pyramid. Draw:

(i) the plan;
(ii) the surface development;
(iii) the true shape. (20 marks)

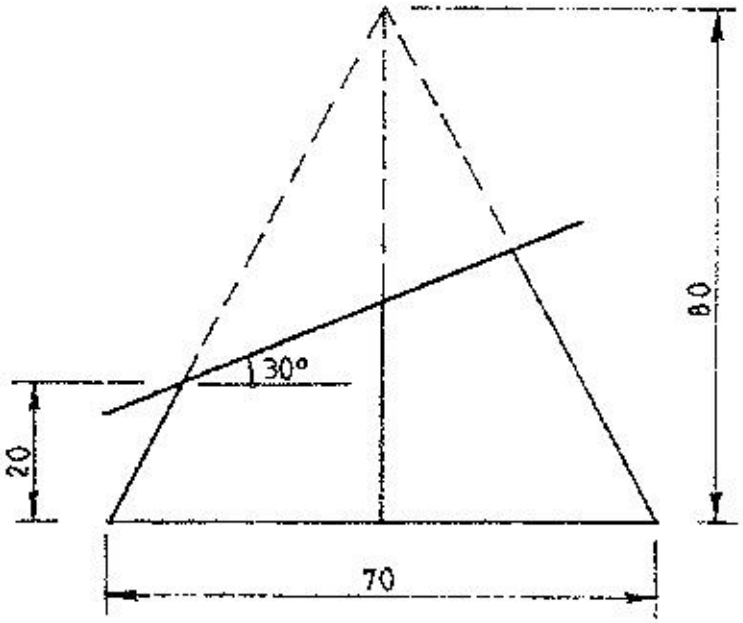

Fig. 06

SECTION C: CONSTRUCTION PLANT

Answer ONE question from this section.

7. (a) State any **four**:

(i) reasons for using mechanical plant in the construction industry;
(ii) factors to consider when selecting excavating plant. (8 marks)

(b) State **two**:

(i) merits of owning a plant;
(ii) demerits of owning a plant. (4 marks)

(c) A contractor has a mixer with a drum capacity of 0.45 m^3 with cycle time of 5 minutes. The amount of concrete required will be 200 m^3. The machine works at 80% efficiency. Assuming a 9 hour working day, determine the number of days it will take to complete the work. (8 marks)

8. (a) State any **four** factors that affect the selection of drilling equipment. (4 marks)

(b) Explain the following terms as used in blasting:

(i) stemming;
(ii) density. (4 marks)

(c) Sketch the following circuits used for detonation of explosives:

(i) parallel;
(ii) series;
(iii) combined. (6 marks)

(d) Explain the following terminologies as used in trucks:

(i) payload;
(ii) struck capacity;
(iii) heaped capacity. (6 marks)

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