

2707/205
BUILDING CONSTRUCTION II, CIVIL ENGINEERING
CONSTRUCTION AND TRANSPORTATION
ENGINEERING I
June/July 2022
Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING

MODULE II

BUILDING CONSTRUCTION II, CIVIL ENGINEERING CONSTRUCTION AND
TRANSPORTATION ENGINEERING I

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Scientific calculator.

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.

All questions carry equal marks.

Maximum marks for each part of a question are indicated.

Candidates should answer the questions in English.

This paper consists of 4 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 II

Answer TWO questions from this section.

1. (a) (i) State four steps to be followed in constructing reinforced concrete slab. (4 marks)
 (ii) Sketch and label a typical beam formwork. (5 marks)
- (b) State four reasons for creating openings in domestic upper floors. (4 marks)
- (c) With aid of a sketch, describe how sound insulation is provided in upper timber floated floor. (7 marks)
2. ✓ (a) ✓ State five functional requirements of a roof. (5 marks)
 ✓ (b) State four merits of steel trusses over timber trusses. (4 marks)
- (c) (i) Describe the shell roof form of construction. (2 marks)
 (ii) State two types of reinforced concrete shell roofs. (2 marks)
- precast
- (d) Figure 1, shows a trimming pitched roof around a chimney stack. Sketch details of section A - A. (7 marks)

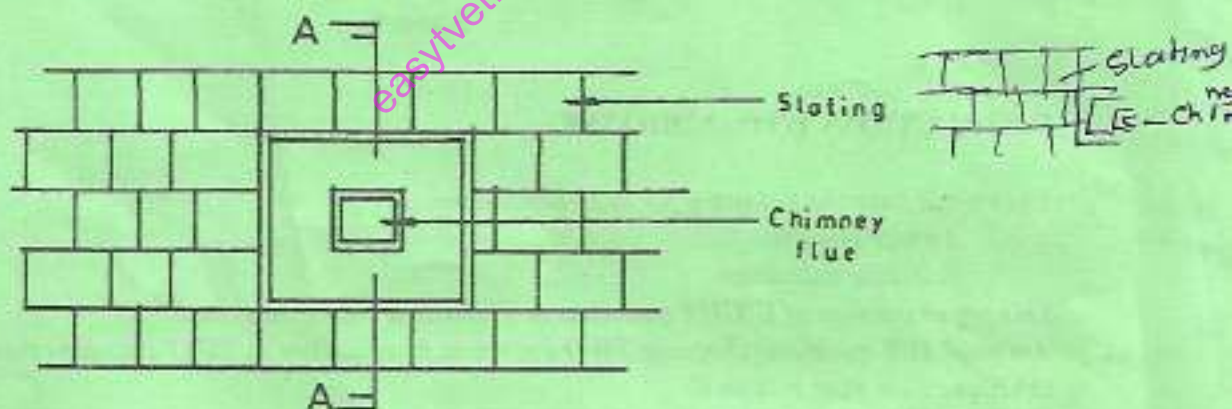


Fig.1

3. (a) State three functions of roofs sheet coverings. (3 marks)
- Aesthetic
- (b) State four: (8 marks)
 (i) disadvantages of flat roofs; They are expensive to purchase. They flat roofs can be easily affected by weather condition.
 (ii) methods of waterproofing flat roofs. Bituminous felt.

- (c) (i) List four methods of fixing roof covering. (2 marks)
- (ii) Sketch and label a closed eave's detail of a pitched timber roof with slates roofing materials. (7 marks)



SECTION B: CIVIL ENGINEERING CONSTRUCTION

Answer TWO questions from this section.

4. (a) Outline two obstacles met during tunnelling. (4 marks)
- (b) State two methods of tunnel linings. (2 marks)
- (c) With the aid of sketches, describe the following coastal protection structures:
- (i) sea walls;
- (ii) groin. (7 marks)
- (d) Use sketches to illustrate the following methods of basement construction.
- (i) piled basement;
- (ii) retaining wall and raft basement. (7 marks)
5. ✓ (a) ✓ State six factors that affect choice of a foundation. (6 marks)
- (b) ✓ (i) State four requirements of an ideal railway sleeper. (7 marks)
- (ii) ✓ Sketch and label a rail fish plate. (7 marks)
- (c) With the aid of sketches, explain the functions of the following water discharge regulating structures:
- (i) ✓ Siphon spillway;
- (ii) ✓ Stop log gates. (7 marks)
6. ✓ (a) (i) ✓ Describe two factors affecting the choice of a dam site. (7 marks)
- (ii) ✓ Sketch and label a rockfill dam. (7 marks)
- (b) State three methods of preventing hydrostatic pressure behind a retaining wall. (3 marks)
- (c) (i) Differentiate between a dug well and bored well.
- (ii) ✓ With aid of a sketch, describe two methods of preventing contamination of dug well. (10 marks)

SECTION C: TRANSPORTATION ENGINEERING I

Answer ONE question from this section.

7. (a) Describe the following sub-surface investigation methods:
- (i) auger drilling;
 - (ii) core drilling.
- (6 marks)
- (b) (i) State **four** factors that affect the choice of a road junction layout,
- (ii) Sketch and label the following grade separated road intersection:
- (I) clover leaf
 - (II) Y-junction.
- (8 marks)
- (c) Explain the following geometric design terms:
- (i) stopping sight distance;
 - (ii) passing sight distance.
- (6 marks)
8. ✓ (a) Describe the following ancient roads:
- (i) Roman roads;
 - (ii) Macadam roads.
- (6 marks)
- (b) (i) Sketch **three** functions of rigid pavement joints.
- (ii) Sketch and label a rigid pavement expansion joint.
- (7 marks)
- (c) Outline the procedure of the C.B.R test.
- (7 marks)

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