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CIVIL ENGINEERING LEVEL 6

CON/CO/CET/CR/06/6/A

Produce Building Drawings

Nov/Dec 2024

TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

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WRITTEN ASSESSMENT

INSTRUCTIONS TO CANDIDATE

1. This paper consists of two sections: A and B
2. Answer ALL the question as guided in each section
3. Marks for each question are as indicated in the brackets
4. You are provided with a separate answer booklet to answer the questions
5. Do not write in this question paper

This paper consists of SIX (6) printed pages

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

SECTION A: (40 MARKS)

Answer ALL the questions in this section

1. Kenya Power Company distributes electricity to every house hold as well as manufacturing firms in Kenya. List FOUR sources of energy used in the generation of electricity in Kenya. (4 Marks)
2. Engineers represent building elements in cross – section while performing various architectural drawings. Sketch the symbols of the following building materials;
    a) Reinforced concrete
    b) Block work
    c) Wrought timber (3 Marks)
3. The electrical drawings consist of various components such as of electrical switches, lighting, fans and appliances. Outline THREE functions of electrical drawing in building construction process. (3 Marks)
4. A final certificate is a certificate issued by the architect at the end of a construction contract, to show the amount of the final payment due to the contractor and to certify that the works have been completed in accordance with the contract. Outline THREE documents required in building drawings approval. (3 Marks)
5. Several materials are used in the manufacture of various pipes used in building works. Identify FOUR materials used in hot and cold-water system. (4 Marks)
6. During the design of architectural plans, architects and building technicians use various references to define shape and size of an object. Enumerate FOUR important references for architects and building technicians when preparing building drawings. (4 Marks)
7. When working with concrete structures on site, you reinforce the concrete with varied bars of different shapes and sizes. Highlight FOUR functions of reinforcement bars in a structural member. (4 Marks)
8. When producing architectural drawings, you must produce floor plans, site plans, sections and elevation. Explain uses of the following drawings required during approval of architectural drawings;
    a) Site plans
    b) Floor plans

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c) Elevations (6 Marks)

9. A ridge is the highest point of a roof and it helps in spilling away water from the top of the roof to the eaves. Sketch and label a ridge detail of a pitched roof. (5 Marks)
10. You are assigned by local authority of your region to supply gas to potential consumers. Outline FOUR basic requirements for gas service pipes you would consider appropriate. (4 Marks)

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SECTION B: (60 MARKS)

Answer Any THREE questions in this section

11. Cold and hot water supply systems are the essential plumbing systems in a building that provide water for various purposes.

a) Explain each of the following terms as used in water supply system;

i. Water line

ii. Warning pipe

iii. Main pipe

iv. Communication pipe

v. Storage cistern (5 Marks)

b) Differentiate between direct cold-water supply and in direct cold-water supply. (4 Marks)

c) With a well labelled sketch describe the process of hot water system operation. (11 Marks)

12. One way of communication in the engineering field is through drawings. When designing, various symbols are used to represent different elements.

a) Sketch the following electrical symbols as used in architectural drawing;

i. Pendant switch

ii. Socket

iii. Fluorescent lamp

iv. Electricity meter (4 Marks)

b) With the aid of a well labelled diagram, describe a ring main wiring (11 Marks)

c) **Figure 1** below shows a current of 0.8 A passing through an arrangement of four resistors. Find the current through the 10 ohm resistor. (5 Marks)

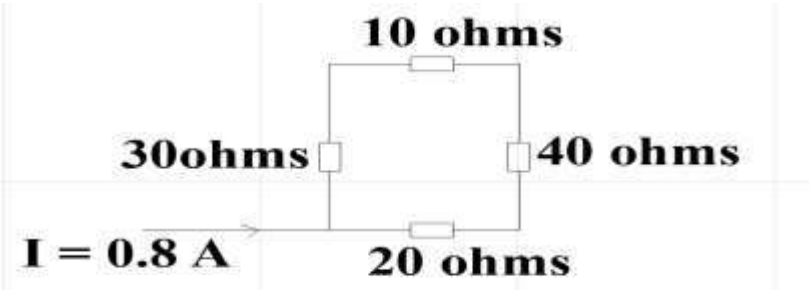


Figure 1

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13. To a scale of 1:10, draw a cross section through an inspection chamber using the following data:
    - Wall thickness 150mm
    - Effective size 750 x 750mm
    - Concrete base thickness 150mm
    - Masonry wall height 900mm
    - Beam 150mm
    - Mild steel cover thickness 30mm
    - Concrete base size 1200 x 1200mm
    - Plaster 20mm
    - Inlet and outlet pipe 100mm Ø at 100mm from base

    Assume any other necessary information. (20 Marks)

14. **Figure 2** below shows the plan of a house. To a scale of 1:20, draw a vertical section through section A – A given the following information;
    - Foundation strip – 600mm wide by 200 mm thick
    - Depth of foundation – 900mm below ground level
    - Foundation walling – 200mm thick natural stone
    - Hardcore filling – 250mm thick
    - Blinding layer - 50mm thick murram
    - Floor slab – 150mm thick oversite concrete on DPM
    - Assume any other information not given (20 Marks)

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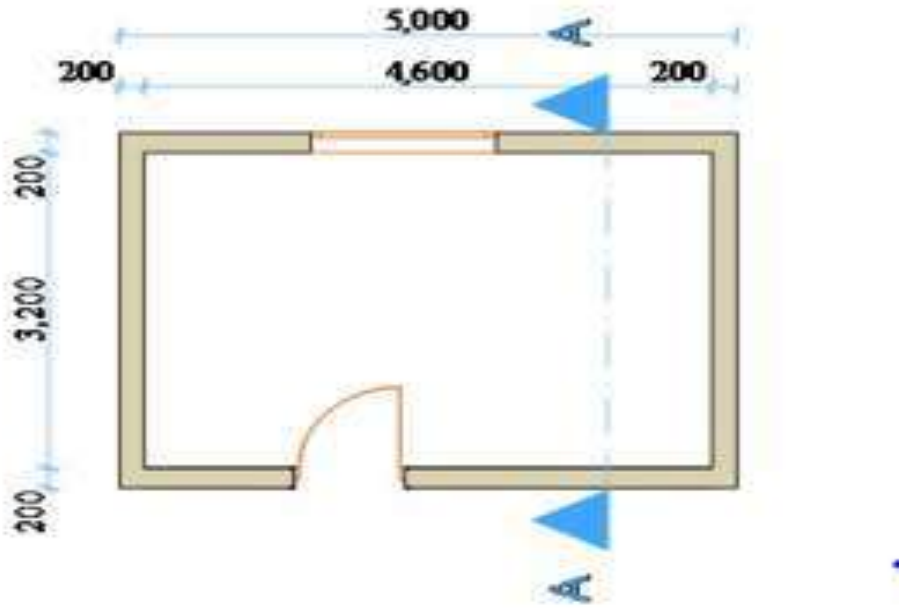


Figure 2

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