GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examination

Construction Processes and Building Practice 2
5200

JUNE 2022 **INTERMEDIATE LEVEL**

Specialty Name and Acronym	CIVIL ENGINEERING BUILDING CONSTRUCTION - CE-BC(F4 BA)
Subject Title	Construction Processes and Building Practice
Subject Code No.	5200
Paper No.	2

Duration: 3 HOURS

INSTRUCTIONS TO CANDIDATES

Answer FIVE Questions.

Section A: Answer Three Questions

Section B: Answer Two Questions

All Questions carry equal marks.

The total marks for this Paper is 100.

Precise answers should be given and where necessary support them with neat sketches.

Answers should be corrected to two decimal places. Take $\pi = 3.14$.

You are allowed to use a Mathematical Set and a non-Programmable Calculator.

You are reminded of the necessity for good English and orderly presentation in your answers.

SECTION A

1. An engineer won a contract to build an office bloc in a swampy site. After filling the area with well compacted soil, it was discovered by the engineer that the bearing soil which can sustain the weight of the building is at 30m deep.

   a. Differentiate between individual building and collective building **(2 marks)**
   b. What is the difference between open tender and negotiated tender? **(2 marks)**
   c. Give four reasons why site investigation is very necessary before the commencement of work on this site. **(4 marks)**
   d. State the function of a quantity surveyor? **(4 marks)**
   e. List four personnel involve in a building team. **(4 marks)**
   f. Sketch a pile foundation and indicate the following: **(ground level, reinforced concrete beam, pile, blockwall)** **(4 marks)**

2.

   a. Define the term "openings" in buildings. **(2 marks)**
   b. Name two parts of an opening in walls **(2 marks)**
   c. Sketch two types of openings in a building **(4 marks)**
   d. Describe two methods of fixing frames to openings. **(6 marks)**
   e. Sketch an arch over an opening and indicate the following parts
      i. Extrados
      ii. Springing line
      iii. Springing point
      iv. Intrados
      v. Rise
      vi. Soffit **(6 marks)**

3.

a. Match the following parts with fig 1.(Tread,Rise,Nosing,Soffit,Riser,LandingGoing, and Toe)**(4 marks)**

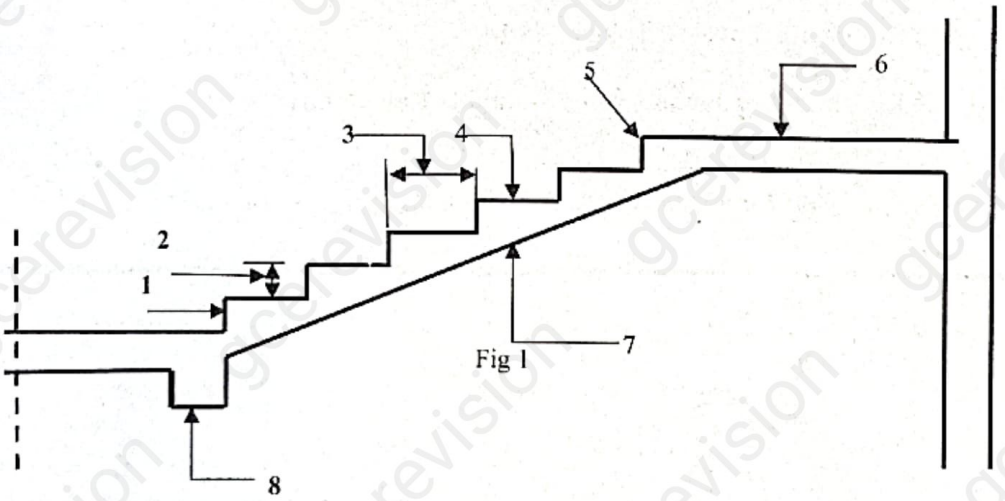


Fig 1

   b. Define an upper floor **(2 marks)**
   c. Floors are classified in three groups; name two of them **(2 marks)**
   d. Name two typesof loads acting on upper floors. **(2 marks)**
   e. State three functional requirements of an upper floor. **(3 marks)**
   f. Sketch a suspended timber ground floor and name the following parts:
      i. Concrete foundation
      ii. Over-site concrete
      iii. Honey comb

iv. Damp proof course
v. Wall plate
vi. Floor boards
vii. Air brick **(7 marks)**

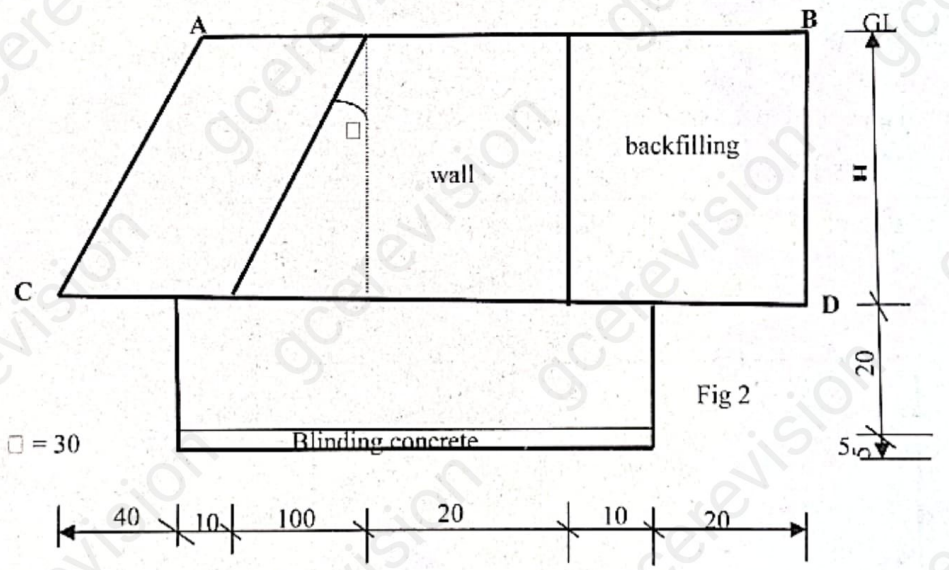
4.

a. State two mechanical equipment used for excavation **(2 marks)**
b. Name four types of foundations. **(4 marks)**
c. Describe and show with a neat sketch the difference between passive and active reinforcement **(6 marks)**
d. Define precast concrete **(2 marks)**
e. Give three advantages of in-situ concrete. **(3 marks)**
f. Differentiate with sketches between construction joint and expansion joint. **(3 marks)**

SECTION B

PROFESSIONAL CALCULATION

5. The drawing in fig 2 represents a retaining wall in mass concrete for the construction of a retaining structure. The excavation will take the form of a trapezium. The small base AC is equivalent to $8/10^{th}$ of the large base. The length of the wall is 10m. All dimensions are in cm.



Calculate:

a. The height **H** of the wall. Take tan $30^0 = 0.578$. **(2 marks)**
b. The volume of excavation knowing that the bulk coefficient is 1.25. **(6 marks)**
c. The volume of blinding concrete. **(2 marks)**
d. The volume of mass concrete. **(4 marks)**
e. The volume of backfilling **(2 marks)**
f. The surface area of formwork for the wall (the lateral faces only given that the ends did not receive the formwork) **(4 marks)**

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6. The figure below shows the section of a gutter measuring 12m long. This gutter is of reinforced concrete. Dimensionsare in cm.

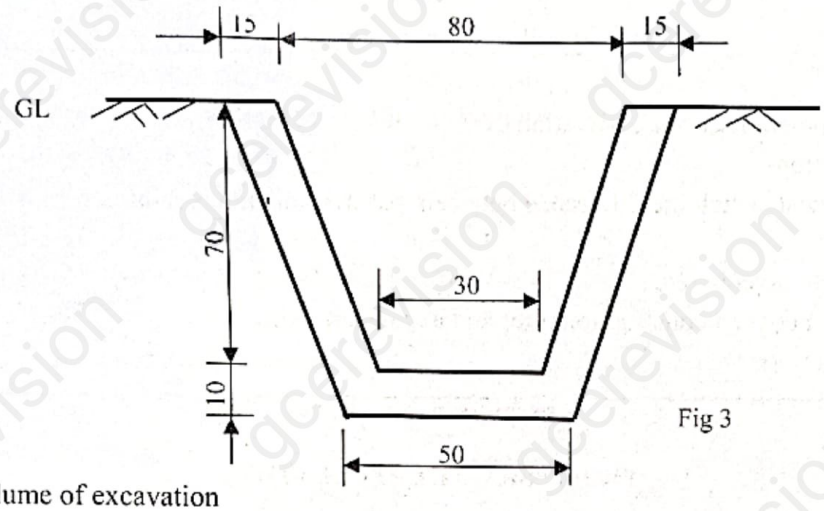

Fig 3

Calculate:

a. The volume of excavation **(5 marks)**
b. The volume of reinforced concrete **(6 marks)**
c. The quantity of reinforcement needed if $1m^3$ contains 15kg of rods and the volume of concrete is $3m^3$. **(2 marks)**
d. Surface area of the gutter to be plastered internally(walls only) **(4 marks)**
e. Considering the volume of concrete to be $3m^3$, calculate the number of bags of cement of 50kg needed if the dosage is $300kg/m^3$. **(3 marks)**
f. The cost of buying cement at 5500frs per bag if 18 bags of cement is needed for the work. **(2 marks)**

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7. The figure below is a plot measuring as shown. Dimensions are in meters

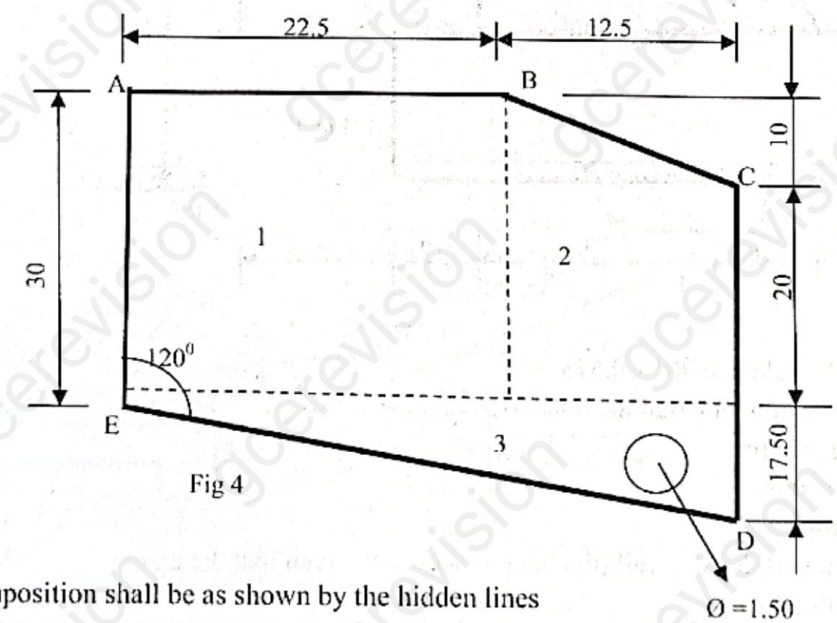

Fig 4

The decomposition shall be as shown by the hidden lines

Calculate:

a. The perimeter of the plot. **(6 marks)**
b. The surface area of the parts 1,2 and 3 **(8 marks)**
c. The owner of the plot plans to pave the whole plot with concrete. Considering that the surface area is $1292m^2$,calculate the volume of concrete if the thickness is 10cm. **(2 marks)**
d. Assuming that the volume of concrete is $129m^3$, calculate the quantity of Material (cement, sand and gravel) needed if the dosage is 1:2:3 **(4 marks)**
