



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

DIRECTORATE OF TVET

SECOND YEAR FIRST TERM EXAMINATION FOR

DIPLOMA IN BUILDING TECHNOLOGY

DIPLOMA IN CIVIL ENGINEERING

GENERAL BUILDING CONSTRUCTION II

DATE: 25/7/2022

TIME: 2:30 – 5:30 PM

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## INSTRUCTIONS

- *This paper consists of **Six** questions.*
- *Answer **five** questions*
- *Maximum marks for each part of the question are as shown.*

## QUESTION ONE

- a) State three advantages and three disadvantages of using precast concrete panels in upper floors (6 marks)
- b) With the aid of a sketch, explain the construction of hollow pots in upper floors (10 marks)
- c) Sketch and label one method of sound proofing wood joists upper floors adjoining thin walls (4 marks)

## QUESTION TWO

- a) sketch and label a ridge detail using plain tiles (5 marks)
- b) with the aid of sketches, distinguish between double roof and trussed roof (6 marks)
- c) describe three functional requirements of a roof (6 marks)
- d) Explain three factors to be considered when selecting the type of roof covering for a pitched roof (3 marks)

## QUESTION THREE

Figure 1 shows a pitched roof. Estimate the cost of the roof structure and its roofing materials using the information given based on the plan. (20 marks)

**DATA**

Tie beam	100x75mm
Rafters	75x50mm @ 1200 c/c
Struts	75x50mm
Kingpost	100x75mm
Purlins (4 no)	50x50mm
GCI sheet	ksh 500 per square meter
Cost of timber	ksh 25,000 per cubic meter
Nails –ordinary	8kgs @ 150/kg
- roofing	5kgs @200/kg
Wall plate	100x75mm
Ridge cap	ksh 500 per 2m piece
Waste	2.5 %
Labour	Ksh.10,000

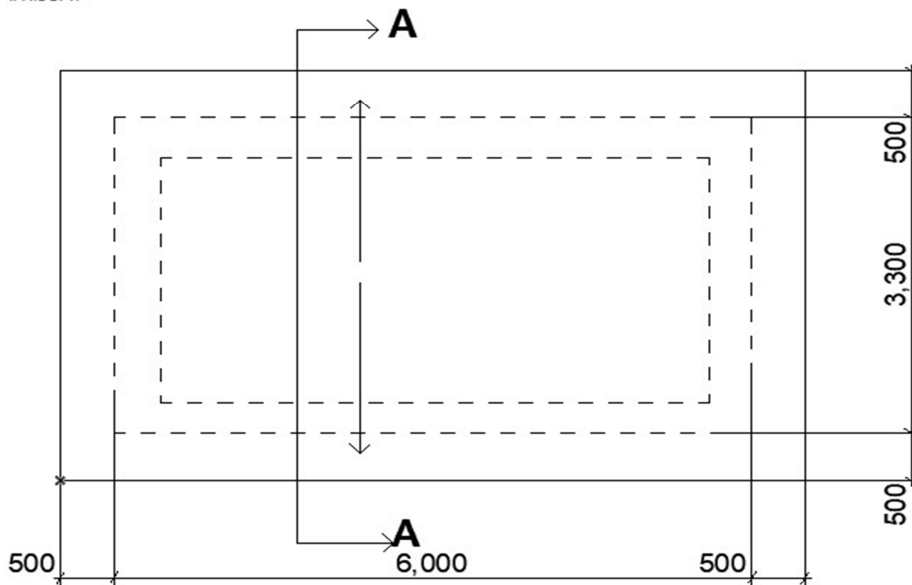
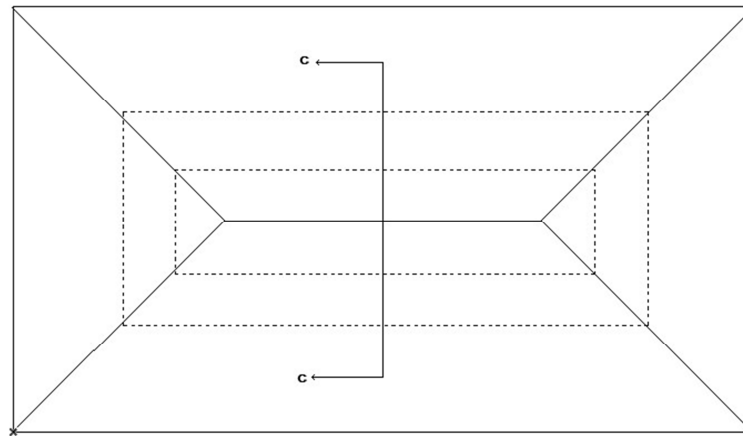


Figure 1

**QUESTION FOUR**

- a) explain the following roof terminologies (6 marks)

- i. eaves
  - ii. hip
  - iii. pitch
- b) describe three functional requirements of a roof (6 marks)
  - c) state three design elements of a roof (3 marks)
  - d) Figure 2 shows a plan of a tiled pitched roof, sketch and label section C-C (5 marks)



### QUESTION FIVE

- a) with the aid of sketches, describe two methods of constructing timber joists in upper floors (5 marks)
- b) state three design requirements for upper concrete floors (6 marks)
- c) describe three conduit fittings (6 marks)
- d) state three functions of a ceiling (3 marks)

### QUESTION SIX

- a) Describe the procedure of constructing a concrete roof (6 marks)
- b) Describe the following roof coverings (4 marks)
  - i. Bitumen felt
  - ii. Wood shingles
- c) State two advantages of shell roofs as compared to traditional roof construction (4 marks)
- d) Explain two functions for each of the following members of a roof (6 marks)
  - i. rafters

- ii. purlins
- iii. fascia board