



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**BSC IN CIVIL ENGINEERING**

**EME 2106 : WORKSHOP PRACTICE**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: 17 May 2016**

## **Instructions to Candidates**

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments.

This paper consists of **FIVE** questions.

Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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## **Question ONE (compulsory)**

a) Describe the following health hazards and for each hazard state the precautions to be observed.

i. Dust and fumes.

ii. Toxic substances.

iii. Noise.

(10 marks)

b) Sketch electrical symbols for the following installation equipment;

i. Distribution board

ii. Consumer control unit

iii. Socket outlet

iv. Two-way switch

v. Intermediate switch

(10 marks)

c) With the aid of suitable sketches describe the anatomy of timber and explain the characteristics of heartwoods as distinct from sapwoods.

(10 marks)

## Question TWO

- a) Hack saws are important workshop tools for cutting metal.
- i. With the aid of a sketch describe the following types of hack saws:
    - I. Adjustable frame hack saw,
    - II. Junior hack saw
    - III. Piercing saw.State the application of each class of hack saw. (9 marks)
  - ii. Define the following terms associated with the hack saw blade.
    - I. pitch,
    - II. set of teeth and
    - III. Number of teeth in contact with the work piece. (3 marks)
- b) With the aid of sketches explain the use the following marking out tools:
- i. Surface plate.
  - ii. Vee block.
  - iii. Surface gauge
  - iv. parallels. (8 marks)

## Question THREE

- a) Describe the following wiring systems stating their application, advantages, disadvantages and any three accessories used with the system.
- i. PVC (polyvinyl chloride sheathed) cable
  - ii. Flexible conduit
  - iii. Steel class B conduit
  - iv. PVC class B conduit (10 marks)
- b) An installation is to consist of three lamps controlled by two way switches and one-way switch. The one-way switch is to act as a master switch. Four socket outlets, three connected in ring and the fourth a spur all done in steel class B conduit system.
- i. List the material required
  - ii. Draw the circuit of the system
  - iii. Describe how you will carry out the installation before its powered.
  - iv. Explain the process of assembling a simple transistor radio using a bread board. (10 marks)

## Question FOUR

- a) With the aid of suitable sketches describe the following timber joinery techniques;
- i. Dovetail joints
  - ii. Scarf joints
  - iii. Tenon and groove joints
  - iv. Mortise joints (10 marks)
- b) Describe the general aspects to consider in selecting timber for;
- i. Construction – roof trusses
  - ii. Joinery works – (cabinets, doors, and tables)
  - iii. Maritime engineering. (10 marks)

## Question FIVE

- a) An electrical wire is to be soldered on a stud.
  - i. Design a joint that will ensure that the connection is strong. (4 marks)
  - ii. Explain the procedure of soft soldering the joint (8 marks)
- b) Explain the effects of moisture content (m/c) in timber and outline a test to determine the percentage of the m/c of timber. (8 marks)