



TECHICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
**CERTIFICATE IN BUILDING & CIVIL ENGINEERING (CTI)**

EBC 1302: WORKSHOP TECHNOLOGY III

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2013**

**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Answer any **THREE** questions

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

### Question One

a) State **ONE** function of each of the following engine components:-

- (i) Camshaft
- (ii) Valves
- (iii) Flywheel
- (iv) Push rods
- (v) Crank pins
- (vi) Gudgeon pins

(6 marks)

b) Define the following engineering terms:

- (i) Valve lag
- (ii) Valve lead
- (iii) Valve overlap
- (iv) Clearance volume

(4 marks)

c) Draw and label a section of a single cylinder engine.

(10 marks)

### Question Two

a) Draw an external micrometer and show all the features

(10 marks)

b) Draw an external micrometer scale when it is set to read:

- (i) 13.75mm
- (ii) 4.28mm

(4 marks)

c) State the use of the following mechanical tools:-

- (i) Surface gauge
- (ii) Tinscris
- (iii) Try square

(6 marks)

### Question Three

a) (i) Explain briefly what is meant by mouth to mouth resuscitation method.

(2 marks)

(ii) State which victims are the above resuscitation applied to.

(1 mark)

(iii) Explain type of first aid that should be given to a person that has broken his leg.

(5 marks)

b) (i) State **THREE** classes of fire.

(3 marks)

(ii) State the causes of each of the fires above.

(6 marks)

(iii) State **ONE** method of extinguishing each of the fires above.

(3 marks)

### Question Four

a) Define the following terms:-

- (i) Electrode boiler
- (ii) Circuit conductor

- (iii) Circuit breaker (3 marks)
- b) (i) Draw a labeled circuit diagram for a staircase lamp controlled independently by two switches one on the ground floor and the other at the 1<sup>st</sup> floor. (5 marks)  
(ii) Draw a labeled diagram for two lamps in parallel being controlled by three switches independently. (5 marks)
- c) State the fuse rating of a domestic lighting circuit. (1 mark)
- d) Draw a ring circuit for **FOUR** 13AMP switched socket outlets and one 13amp spur socket outlets supplied from a consumer's distribution board. The diagram should be labeled. (6 marks)

### Question Five

- a) Explain the functions of the following as applied to electrical cables:-  
(i) Armour  
(ii) Insulator  
(iii) Conductor (6 marks)
- b) Explain what an earth electrode is and how it is used to protect the consumer. (4 marks)
- c) State the fuse rating and the rise of cables for: (6 marks)  
(i) Lighting circuit  
(ii) Ring circuit for socket outlets  
(iii) Cooker circuit
- d) Explain why during transmission of power voltage has to be stepped up. (4 marks)