TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

CERTIFICATE IN ELECTRICAL POWER ENGINEERING (CEPE 2)   PPI

ENGINERING SCIENCE II

EEP1103

END OF SEMESTER EXAMINATION SERIES:

MAY 2016

TIME: HOURS

DATE:

<u>Instructions to Candidates</u>

You should have the following for this examination

Answer booklet, examination pass and student ID

This paper consists of five Questions; Attempt any THREE Questions.*)*

DO not write on the question paper.

QUESTION ONE

(a) (i) Describe with aid of a diagram a thermo electric thermometer

(ii) State any three advantages of thermistors as applied in temperature measurement.   (8 marks)

(b) (i) With the aid of a diagram describe a thermostate which is used to control current flowing to an appliance.

(ii) Explain the difference between a thermistor and a thermostat.   (7 marks)

(c) Calculate the heat needed to change 8g of ice to water at 10c   (5 marks)

QUESTION TWO

a) (i) Describe with the aid of a diagram a vacuum flask.

(ii) State the difference between these methods of heat transfer radiation and conduction   (8 marks)

b) (i) Describe an experiment which shows that a shiny or white surface is a poorer absorber of heat than a dull or black surface.   (6marks)

(ii) Explain the term latent heat of fusion of a solid   (3 marks)

c) State the factors that affect the evaporation of a liquid   (3 marks)

QUESTION THREE

a (i)Define the term statics

(ii) Explain: - (i) stable (ii) unstable

(iii) Stable equilibrium and give any example of each.   (7 marks)

b (i) Explain the terms:- (i) force (ii) work

(ii) Calculate the work done in lifting a box of 100kg through a height of 20 meters high (take g=9.81m/s^2)   (8 marks)

C. A box of mass 4kg is allowed to drop freely from rest from a height 7M above the ground calculate:-

(i) Its potential energy

(ii) Its Kinetic energy when it has fallen a distant of 4M from rest.   (5marks)

QUESTION FOUR

(a)   (i) Define the term " gravitation force"

(ii) A stone is dropped from a tower 200m high assuming g=9.81M/S² and the resistance of air is negligible calculate:-

I.   Time taken to reach the ground.

II.   The velocity of the stone when it hits the ground.

III.   The distance through which the stone falls during the first 3 seconds (9marks)

(b)   (i) Define the following terms :-

(I) Deceleration

(II) Uniform velocity

(ii) A train slows from 80km/h with a uniform deceleration of 4m/S²

How long will it take to reach 20km/h   (6 marks)

(c)   A car has a velocity of 10m/s it now accelerates at 2m/s² for ½ min
Find the distance travelled in this time   (5marks)

QUESTION FIVE

(a)   (i) Define the term " momentum"

(ii) A light beam AD rests on supports at B and C, A load of 5N is placed at o, where BO is 40cm and co is 60cm.

Find the reactions P and Q at the supports   (8marks)

(b)   (i) Explain the changes in the Potential and Kinetic energies of the bob of a simple pendulum as it goes from one side of its swing to the other   (5marks)

(ii) A car is pulled up a slope by a constant force of 500N at uniform speed of 6m/s . It takes 6 min to complete the journey.

I.   How much work is done in getting the car to the top of the slope?

II.   How much work would be done if the speed were 12m/S?   (7 marks)