MACHAKOS UNIVERSITY

University Examinations for 2019/2020Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

CERTIFICATE IN ELECTRICAL AND ELECTRONICS ENGINEERING

EPC 213: ECTRICAL MEASUREMENTS AND FAULT DIAGNOSIS (EMFD)

DATE: 22/10/2020 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

Answer Question One and Any Other Two Questions

Use €= 8.85 x 10-12 F/M

µo= 4 π x 10-7 H/M

Neat work recommended

QUESTION ONE (30MARKS)

a) What is a measurement system? (3 marks)

b) With the aid of block diagrams explain an instrumentation system (10 marks)

c) Describe THREE methods applied in measurement systems (10 marks)

d) Explain the Bordon tube pressure gauge (7 marks)

QUESTION TWO (20 MARKS)

a) With the aid of labeled diagrams explain the construction of

i. An ammeter

ii. A voltmeter (8 marks)

b) A moving – coil instrument of 10Ω gives a f.s.d when the current is 8mA. Calculate the value of the multiplier to be connected in series with the instrument so that it can be used measuring p.d.s upto 100v. (8 marks)

c) Differentiate between shunts and multiplies in sensitive galvanometers (4 marks)

QUESTION THREE (20 MARKS)

a) With the aid of diagrams explain the application of a piezo Electric crystal (5 marks)

b) Show how a simple Radio receiver is constructed (3 marks)

c) Describe a super heterodyne radio receiver (10 marks)

d) Briefly explain an Oscillator circuit (2 marks)

QUESTION FOUR (20 MARKS)

a) Explain the choice of an Oscillator frequency (3 marks)

b) A receiver having an intermediate frequency of 465KHZ is tuned to a frequency range from 500 KHZ to 1500 KHZ . If the frequency of the local Oscillator is higher. Find the tunable frequency range (4 marks)

c) Show an expression for the following frequency :-

i. Oscillatory frequency

ii. Image frequency (4 marks)

d) With the aid of a diagram describe the compling of a ferrite rod antenna to an am radio receiver (9 marks)

QUESTION FIVE (20 MARKS)

a) Explain a transducer (2 marks)

b) Different between analogue and digital signals (4 marks)

c) With the aid of labeled diagrams explains cathode ray Oscilloscope (10 marks)

d) Show the construction of a moving - Iron receiver (4 marks)