TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

CERTIFICATE IN TECHNOLOGY

ELECTRICAL AND ELECTRONICS ENGINEERING (CEEE2)

EEE 1101

ANALOGUE ELECTRONICS

END OF SEMESTER EXAMINATIONS

SERIES: APRIL 2016

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

1) You should have the following for this examination;
    - Answer booklet
    - Non-programmable calculator
2) Answer any THREE Questions

QUESTION ONE

a) 1 State three factors that affect the stability of a transistor amplifier
   2 Two possible effects of excessive shift of the Quescent point of a Transistor amplifier.
   6 Marks
b) Sketch a labbled output Characteristics curves of a common emtter and show the cut off and Saturation regions 7 Marks
c) A transistor amplifier operating in Class A mode has the following characteristics $\Delta I_c = 2mA$, $R_e = 12K\Omega$ $_{\Delta} I_b = 200mA$, Vce = 10V, and Vcc= 24 Volts. Calculate the current Gain 'B' and the the value of the Emitter Current (Ie) 7 Marks

QUESTION TWO

a) 1 Define the following as applied to Semi conductor theory
   1. Doping
   2. Extrinsic Semi conductor 3 Marks
b) With the aid of diagrams , describe how a P-N Junction is formed. 6 Marks
c) A crystal diode having internal resistance of 150Ω, is used for half wave rectification. If the applied Voltage is V = 50sinwt, and the Lord resistance is Rl =800Ω, Find
   1. $I_{m,}$, $I_{dc,}$, I_{rms}
   2. Ac power input and dc power output
   3. Dc output Voltage
   4. Efficiency of rectification 11 Marks

QUESTION THREE

a) Using sketches explain the operation of the following classes of Amplifiers

   Classes A, B, C. 9 Marks

b) State any three comparisons between BJT and FET. 3 Marks
c) With the aid of diagrams , describe the construction and operation of an enhancement mode MOSFET. 8 Marks

QUESTION FOUR

a) With the aid of diagrams describe the construction and operation of a Cathode Ray tube employing Electric focussing and deflection system. 11 Marks
b) 1 Explain the function of the Time base in a CRO.
   2 Explain how time base can be used to display an alternating waveform on an Oscilloscope.
   9 Marks

QUESTION FIVE

a) Draw a diagram of a Centre tap full wave rectifier and describe its operation. 10 Marks
b) Explain the Principle of the following types of Filters
   1 Shunt Capacitor
   2 ∏- Filter

10 Marks

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QUESTION ONE

d) 1 State four factors that affect the stability of a transistor amplifier
   2 Two possible effects of excessive shift of the Quescent point of a Transistor amplifier.
   6 Marks
e) Sketch a labbled output Characteristics curves of a common emtter and show the cut off and Saturation regions 7 Marks
f) A transistor amplifier operating in Class A mode has the following characteristics $\Delta I_c = 1mA$, $R_e = 6K\Omega$ $_{\Delta} I_b = 100mA$, Vce = 5V, and Vcc= 12 Volts. Calculate the current Gain 'B' and the the value of the Emitter Current (Ie) 7 Marks

QUESTION TWO

d) 1 Define the following as applied to Semi conductor theory
   3. Doping
   4. Extrinsic Semi conductor 3 Marks
e) With the aid of diagrams , describe how a P-N Junction is formed. 6 Marks
f) A crystal diode having internal resistance of 200Ω, is used for half wave rectification. If the applied Voltage is V = 50sinwt, and the Lord resistance is Rl =800Ω, Find
   5. $I_{m,}$, $I_{dc,}$, I_{rms}
   6. Ac power input and dc power output
   7. Dc output Voltage
   8. Efficiency of rectification 11 Marks

QUESTION THREE

d) Using sketches explain the operation of the following classes of Amplifiers

   Classes A, B, C. 9 Marks

e) State any three comparisons between BJT and FET. 3 Marks
f) With the aid of diagrams , describe the construction and operation of an enhancement mode MOSFET. 8 Marks

QUESTION FOUR

c) With the aid of diagrams describe the construction and operation of a Cathode Ray tube employing magnetic focussing and deflection system. 11 Marks
d) 1 Explain the function of the Time base in a CRO.
   2 Explain how time base can be used to display an alternating waveform on an Oscilloscope.
   9 Marks

QUESTION FIVE

c) Draw a diagram of a full wave bridge rectifier and describe its operation. 10 Marks
d) Explain the Principle of the following types of Filters
   1 Shunt Capacitor
   2 ∏- Filter 10 Marks