(Knowledge for Development)

KIBABII UNIVERSITY
(KIBU)

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS
YEAR ONE SEMESTER ONE EXAMINATION

FOR THE DEGREE OF
(INFORMATION TECHNOLOGY)

COURSE CODE: DIT 115

COURSE TITLE: BASIC ELECTRONICS

DATE: 27/01/ 2022   **TIME:** 2.00P.M- 4.00P.M

INSTRUCTIONS

ANSWER **QUESTIONS ONE** AND **ANY OTHER TWO.**

QUESTION ONE (COMPULSORY) [30 MARKS]

(a) List any two passive device and two active devices   [4 marks]

(b) Jane has three resistors of magnitude 200, 400 and 800 ohms. She has DC battery of 10 Volts. Determine   [6 marks]

    (i)   The current in circuit if she connects the three resistors in series

    (ii)   The current in 800 ohms resistor if she connects the three parallel

(c) Determine the parallel resonance frequency of 10 microFarad capacitor and 0.2Henries inductor   [3 marks]

(d) Distinguish between ;   [10 marks]

    (i)   Donor and acceptor semiconductor

    (ii)   Semiconductor and Insulator

    (iii)   Intrinsic and Extrinsic conduction in semiconductor

    (iv)   A bipolar and unipolar transistors

    (v)   Wide band and narrow band amplifies

(e) Show that gain with feedback of an amplifier is given by $A_{vf} = A_v/(1 \pm \beta A_v)$ [4 marks]

(f) List the three configuration of amplier   [3 marks]

QUESTION TWO [20 MARKS]

(a) With aid of circuit diagram of RC coupled amplifier explain the function of each components   [10 marks]

(b) With aid the frequency response diagram of the circuit in (a) above   [10 marks]

    (i)   Explain the response

    (ii)   write an expression for bandwidth

    (iii)   Explain how you increase the bandwidth and resulting trade off

QUESTION THREE [20 MARKS]

(a) Explain the stages of operation amplifier   [8 marks]

(b) With aid of circuit diagram derive the transfer function of the following OPAM circuit

    (i)   Inverting amplifier

    (ii)   Integrator

    (iii)   Summer   [12 marks]

QUESTION FOUR [20 MARKS]

(a) With the aid of circuit diagram and waveform of full wave bridge rectifier explain its operation   [12marks]

(b) For circuit in (a) above for 240 AC Volts is fed on the primary side of step-down transformer whose turn ration 20:5. Determine   [8 marks]

    (i) Voltage at secondary side

    (ii) DC output voltage

QUESTION FIVE [20 MARKS]

(a) With aid of circuit diagram and waveforms explain the operation of tuned collector oscillator   [10 marks]

(b) With aid of diagram derive the expression for drawing   [6 marks]

    (i)   DC load line

    (ii)   AC load line

(c) With aid of diagram and waveform illustrate class B operation of amplifier [4 marks]