MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2018/2019 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER EXAMINATION

SCHOOL OF SCIENCE AND INFORMATION SCIENCES

UNIVERSITY EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE)

COURSE CODE: COM 3228

COURSE TITLE: ELECTRONICS II

DATE: 3RD DECEMBER 2018 TIME: 11:00 – 13:00 (2 HOURS)

INSTRUCTIONS

- Answer Question ONE and any other TWO

SECTION A. COMPULSORY

QUESTION ONE [30 MARKS]

(a) Give reasons why common emitter configuration is widely used in amplifier circuit **(3mks)**

(b) i. State four ways of classifying amplifiers **(2mks)**

ii). Briefly explain why class B power amplifier exhibits crossover distortion in its output . (**2marks**)

c) What is transistor biasing. What are the basic conditions which are to be necessarily fulfilled for achieving faithful amplification of input signal in transistor amplifiers **(5marks)**

d) What are the advantages of the FET over a conventional bipolar junction transistor (**2marks)**

e.) Define **(4marks)**

i) Pinch off voltage,
ii) Transconductance,

iii) Amplification factor
iv) Drain resistance of a FET

f. Explain the classification of power amplifiers according to operational modes. **(6 marks).**

g.Compare small signals and large signals **(6marks)**

SECTION B: ANSWER ANY TWO QUESTIONS [40 MARKS]

QUESTION TWO [20 MARKS]

a. i.Define Feedback Amplifier and draw its diagram **(3marks)**

ii. Briefly explain the impact of negative feedback on noise in circuits. (**2marks**)

iii. Give some applications of voltage feedback. **(2marks**)

b.Acommon emitter amplifier has an input resistance Ri=2.5kΩ and a voltage gain of 200.If the input signal voltage is 5mV,find

(i).the base current (**2marks)**
(ii).the collector current **(2 marks**)
(iii).the power gain and (**2 marks)**
(iv).dB power gain **(2 marks)**

c. What are the advantages of the FET over a conventional bipolar junction transistor **(5marks)**

QUESTION THREE [20 MARKS]

a. Briefly explain 'multistage transistor amplifier . State four coupling schemes used in amplifiers. **(12marks)**

b. With a negative feed back an amplifier gives an output of 10v with an input of 0.5v.When the feedback is removed, it requires 0.25v input for the same output. Calculate

i. gain without feedback **(4 marks)**

ii. feedback ratio β (**4 marks)**

QUESTION FOUR [20 MARKS]

a.i. A BJT has a base current of 250 μA and emitter current of 15mA Determine the collector current gain and β (3marks)

ii. List the four basic feedback topologies (3 marks).

iii. Why N-channel FET's have a better response than P-channel FET's (3marks)

b). In an amplifier with negative feedback, the gain of the basic amplifier is 100 and it employs a feedback factor of 0.02. If the input signal is 40mV, determine

(i) Voltage gain with feedback and (**3marks)**

(ii) Value of output voltage. **(2 marks**)

c) The transistor in the feedback circuit shown below has β=200. Determine

(i) Feedback ratio, **(2marks)**

(ii) Voltage gain without feedback **(2marks)**

(iv Voltage gain with feedback in the circuit. In the transistor, under the conditions of operation, VBE may be assumed to be negligible. **(2marks)**

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