MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS

2017/2018 ACADEMIC YEAR

SCHOOL OF SCIENCE AND INFORMATION SCIENCES

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

THIRD YEAR FIRST SEMESTER EXAMINATION

COURSE CODE: COM 313
COURSE TITLE: ELECTRONICS II

DATE: 20TH APRIL 2018   **TIME: 11:00AM-1:00PM**

INSTRUCTIONS

- Answer Question **ONE** and any other **TWO**

This paper consists of 4 printed pages. Please turn over.

SECTION A. COMPULSORY

QUESTION ONE   (30 MARKS)

a.) i. Differentiate between linear and non linear amplifier   **(2 marks)**

   ii. Define the frequency response of Amplifier   **(2mks)**

   iii. Based on the transistor configuration how amplifiers are classified.   **(2marks)**

b).   Define the following terms as used in BJT amplifier

   i.input resistance   **(1mark)**

   ii.current gain.   **(1mark)**

  iii.power gain   **(1mark)**

 (c**) i.** State four factors considered when classifying amplifiers   **(2 marks)**

   ii). Compare class A ,class B and class C amplifiers its output .   **(3 marks)**

 d. 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   **(2marks)**

   (ii) value of output voltage   **(2marks)**

e. A BJT has a base current of 250 µA and emitter current of 15mA Determine the collector   current gain and β   **(2marks)**

f.   List the four basic feedback topologies   **(3 marks)**

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

h. i.) Define the principle of feedback   **(1 mark)**

ii. Briefly explain positive feedback and negative feedback   (**2 marks)**

iii. State two advantages of and one disadvantage of negative feedback. (**1marks**)

QUESTION TWO (20 MARKS)

a). Draw the circuit of the common emitter transistor configuration. Why common emitter configuration is mostly used? Give its typical uses**.   (8 marks)**

b). What are the advantages of the FET over a conventional bipolar junction transistor
(4marks)

c). Define

   i. pinch off voltage,   **(2marks)**

   ii. trans-conductance,   **(2marks)**

   iii. amplification factor and   **(2marks)**

   iv. drain resistance of a FET.   **(2marks)**

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)

Determine the following for the network figure 2

a) (i) V_{GSQ} **(2marks)**
   (ii) I_{DQ} **(2marks)**
   (iii) V_{DS} **(2marks)**
   (iv) V_D **(2marks)**
   (V) V_G **(2 marks)**
   (vi) V_S **(2 marks)**

+20 V

R_D
3.3 kΩ

D

G

$I_{DSS} = 8$ mA
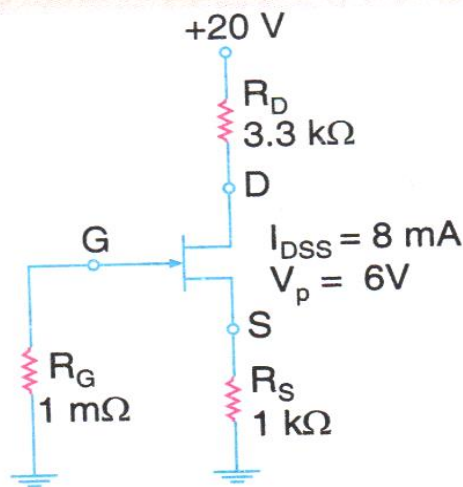$V_p = 6V$

S

R_G
1 mΩ

R_S
1 kΩ

Fig.2.0.

b. 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)

End and Good Luck