THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

CERTIFICATE IN ELECTRONICS

ANALOGUE ELECTRONICS II

END OF SEMESTER EXAMINATIONS

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Drawing instruments*
- *Scientific calculator*

This paper consists of **FIVE** questions

Answer question **ONE (COMPULSORY)** and at least **THREE** other questions

Maximum marks for each part of question are clearly indicated
This paper consists of **THREE** printed pages

Question 1 (Compulsory)

a) (i) state **FOUR** properties of an ideal operational amplifier
(ii) Define the term slew-rate and C.M.R.R as used in 'op-amps' (8 marks)

b) Draw and explain the frequency response curve of an RC compled CE amplifier (6 marks)

c) (i) State **THREE** advantages of negative feedback as used in amplifiers
(ii) State any **TWO** advantages and **TWO** disadvantages of RC compled amplifier (6 marks)

d) With the aid of diagrams, explain the operation of class AB push-pull power amplifier (10 marks)

Question 2

a) State:
i) Any TWO causes of drift in DC amplifier
ii) Any TWO methods of reducing it (4marks)

b) Draw the circuit diagram of a Darlington pair amplifier and show that its gain is give by β^2 (14 marks)

c) Draw a characteristic curve for a DC amplifier (2 marks)

Question 3

a) With the aid of diagrams, explain how you can
i) 'null' an op-amp
ii) Determine common-mode gain (10 marks)

b) Design an adder circuit using an 'op-amp' to get the output expression as

$V_o = - (0.1V_1+V_2+10V_3)$

Where V_1, V_2 and V_3 are input voltages

Assume Rf = 10k Ω (10 marks)

Question 4

a) With the aid of diagrams, explain the following classes of amplifier operations:
i) Class A
ii) Class B (10 marks)

b) With the aid of diagrams, explain how distortion occurs in class B amplifier and state its possible remedy (10 marks)

Question 5

a) (i) Differentiate between a stable multivibrator and unstable multivibrator (3 marks)

(ii) With the aid of diagrams, explain the operation of an a stable multivibrator (10 marks)

b) Explain the meaning of the following terms
   (i) Damped oscillations
   (ii) Undamped oscillations (4 marks)

c) Explain how to convert damped oscillations to undamped oscillations (3 marks)