



**MASENO UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2015/2016**

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE  
OF BACHELOR OF BACHELOR OF SCIENCE IN COMPUTER  
TECHNOLOGY**

**MAIN CAMPUS**

**CCT 112: ELECTRONICS II**

Date: 21<sup>st</sup> April, 2016

Time: 8.30 - 10.30am

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**INSTRUCTIONS:**

- **Answer ALL Question in Section A and any other TWO from Section B.**

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ISO 9001:2008 CERTIFIED



### Question 1(30mks)

- a) Under the headings, input resistance, voltage gain, output resistance, compare the following amplifier configurations:
- i) emitter-follower (common collector)
  - ii) common-emitter
  - iii) common-base
- (9mks)
- b) Calculate the following power levels in dBm
- i) 1mW (2mks)
  - ii) 1W (2mks)
  - iii) 10W (2mks)
- c) Derive the overall voltage gain of two voltage amplifiers connected in series (7mks)
- d) Sketch the ac equivalent circuit of a common-emitter amplifier and derive equations for:
- i) Input resistance,  $R_{in}$  (3mks)
  - ii) Open circuit voltage gain,  $A_v$  (2mks)
  - iii)  $R_o$  (3mks)

### Question 2(20mks)

- a) List any THREE differences between BJTs and FETs (3mks)
- b) A JFET circuit is described as follows: The drain is connected to +VDD(= 12 V) through a resistor( $R_d$ ); The gate is connected to ground through a large resistor; the source is connected to ground through a 2k resistor.
- i) Sketch the circuit (9mks)
  - ii) Calculate the value of  $R_d$  if  $I_d = 1\text{mA}$  (8mks)



**Question 5(20mks)**

- a) Sketch the amplifier equivalent circuit of Fig Q4 and calculate  $R_{in}$ ,  $A_v$ ,  $R_o$  (10mks)
- b) Calculate the power delivered to a load of  $5k$  when the amplifier is driven from a  $10\text{ mV}$  source with an internal resistance of  $1k\Omega$  (10 mks)