



Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



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THIRD SEMESTER B.TECH (INSTRUMENTATION & CONTROL ENGINEERING) END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: ANALOG ELECTRONICS CIRCUIT [ICE-2104]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitably assumed.
- **1A.** Explain the working of depletion type MOSFET with neat schematic diagram
- **1B.** Define the following terms:
 - i. Transconductance, ii. Amplification factor, iii. Gate cut-off current
- **1C.** Determine the following V_{GSQ} , I_{DQ} , V_{DS} , V_D for the circuit shown in Fig. 1



- 2A. Construct an E-MOSFET drain feedback biasing circuit and derive the relation for Gate 3 source voltage (V_{GS}) and Drain current (I_D) at Q point.
- 2B. Determine Input impedance, Output impedance and gain for the circuit shown in Fig. 2, 3 and also represent the model of the same.
- 2C. Derive the equation for input impedance, output impedance, and gain for a common 4 gate configuration amplifier considering the effect of load and signal resistance.
- **3A.** For the circuit shown in Fig. 3 determine Input impedance, Output impedance and gain **3**
- 3B. Plot the low frequency response characteristics of the circuit shown in Fig. 4. 4



- **3C.** Determine the condition for f_{Hi} and f_{Ho} of a source follower circuit. Also plot the high **3** frequency response for the same.
- **4A.** Construct a practical voltage series feedback circuit. Also derive the relation for A, β **4** and A_f.
- **4B.** Discuss the effect of different feedback topologies on input and output impedance of an **3** amplifier
- **4C.** Construct a circuit which can generate an oscillation of fixed frequency using a tuned **3** series connected inductances.
- **5A.** Design an RC phase shift oscillator for an oscillatory frequency of 30kHz **3**
- **5B.** Explain the operation of series operated crystal oscillator using FET. **4**
- **5C.** Compare Class A, Class B and Class AB type of power amplifiers

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