Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

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. Sketch and explain the transfer characteristics of JFET. **3**

1B. Explain the construction and working of n – channel enhancement type MOSFET. Sketch the drain charectoristic. **3**

1C. Compute V_{GSQ}, I_{DQ}, V_{DS}, V_D for the circuit shown in Fig. 1. **4**

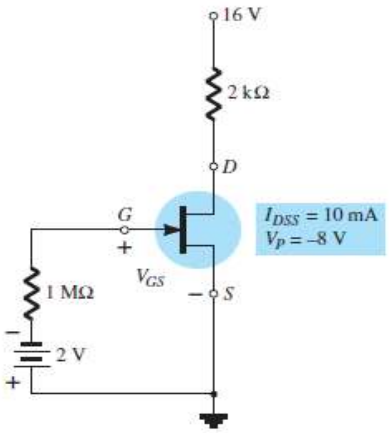

Fig. 1

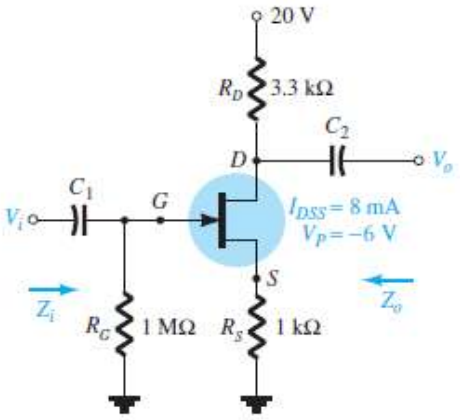

Fig. 2

2A. Construct an E-MOSFET voltage divider biasing network and derive the conditions for V_G, V_{GS} and V_{DS}. **3**

2B. Determine the Input impedance, Output impedance and gain for the circuit shown in Fig. 2, and also represent the model of the same. Given: V_{SGQ} = -2.6v, I_{DQ} = 2.6mA and *Y*os = 20µs. **3**

2C. Derive the equation for input impedance, output impedance, and gain for a source - **4**

follower considering the effect of load and signal resistance.

3A. Determine the low frequency response characteristics for the circuit shown in Fig. 3, having R_{sig} = 100 Ω and R_L= 2.2kΩ. **3**

3B. Plot the high frequency response characteristics of the circuit shown in Fig. 4. **4**

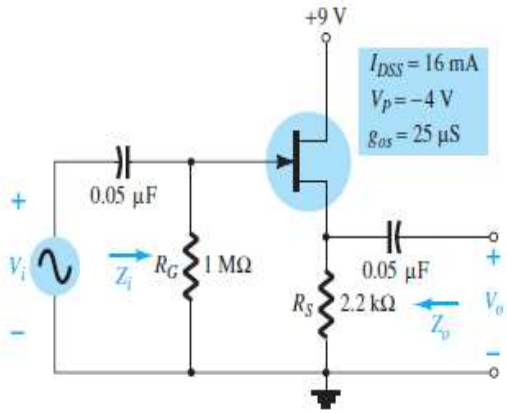

Fig. 3

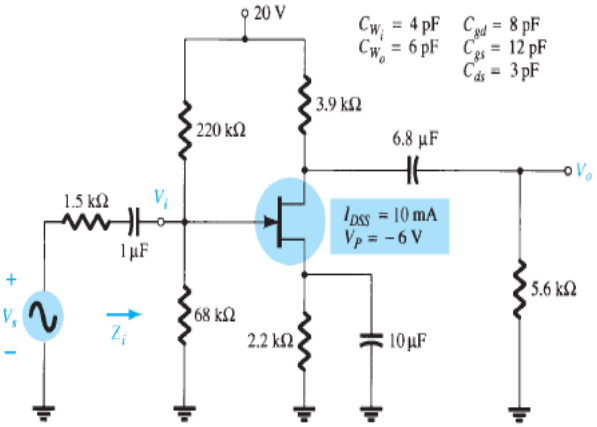

Fig. 4

3C. Draw the diagram of cascade amplifier. Sketch the frequency response and analyze. **3**

4A. With a circuit, analyze the characteristics of a current series feedback amplifier. **4**

4B. Discuss the effect of feedback on gain, input impedance and output impedance of voltage series and voltage shunt topologies. **3**

4C. Design the RC elements of a Wien-bridge oscillator for the operating frequency of f_o = 10KHz. **3**

5A. In a Hartley oscillator, uses 2mH and 20μH inductors and a variable capacitor. Calculate the range over which the capacitor need to be varied for oscillating frequency from 950kHz to 2050kHz **3**

5B. Design and explain the working of RC phase shift oscillator. **4**

5C. Discuss the effect of ac load line on Class A and Class B type of power amplifiers. **3**

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