



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Second Semester, B.E. - Semester End Examination; May / June - 2019

Electronic Devices and Communication

(Common to All Branches)

Time: 3 hrs

Max. Marks: 100

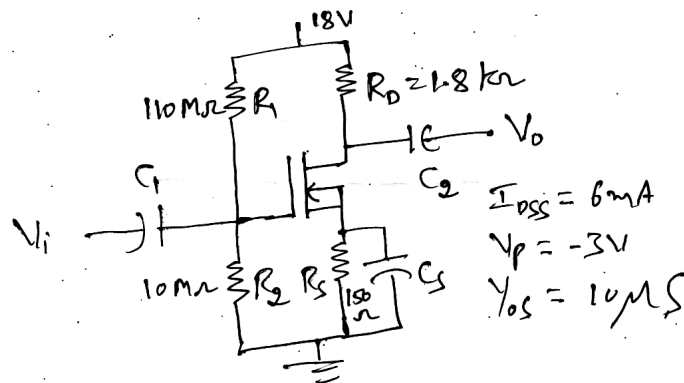
Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Using the series diode configuration, explain the concept to fix Q-point on the diode forward characteristics curve. 7
- b. Explain full wave bridge rectifier. 7
- c. Determine the range of input voltage for a basic Zener regulator to maintain the Zener diode in 'on' state. Take; $R = 220 \Omega$, $R_L = 1.2 \text{ k}\Omega$, $V_Z = 20 \text{ V}$ and $I_{ZM} = 60 \text{ mA}$. 6
- 2 a. With circuit diagram and waveform, explain clamping circuit. 7
- b. Explain center-tapped full wave rectifier. 7
- c. Describe the operation of IR emitters. 6

UNIT - II

- 3 a. Describe the device structure, operation and characteristics curve of n -channel enhancement type MOSFET. 10
- b. For the voltage divider network with n -channel E -type MOSFET. Find I_{DQ} , V_{GSQ} and V_{DS} . Take; $V_T = 5 \text{ V}$, $I_{D(on)} = 3 \text{ mA}$ at $V_{GS(on)} = 10 \text{ V}$, $R_1 = 22 \text{ M}\Omega$, $R_2 = 18 \text{ M}\Omega$, $R_D = 3 \text{ k}\Omega$, $R_S = 0.82 \text{ k}\Omega$, and $V_{SS} = 40 \text{ V}$. 10
- 4 a. Describe the device structure, operation and characteristics curve of depletion type MESFET. 10
- b. For the network shown in Fig. 4(b), $V_{GSQ} = 0.35 \text{ V}$ and $I_{DQ} = 7.6 \text{ mA}$
 - i) Determine g_m and g_{m0}
 - ii) Find r_d
 - iii) Sketch the AC equivalent circuit
 - iv) Find Z_i , Z_o and A_v



UNIT - III

- 5 a. Describe the operation of 3-input inverting summing amplifier. 7
- b. Write the circuit diagram and output voltage equation for the following Opamp circuit : 6
 - i) Integrator
 - ii) Differentiator

- c. Describe the following :
- i) Gain Bandwidth 7
 - ii) Slew Rate
 - iii) Maximum Signal Frequency
- 6 a. Show the cascade connection of an LM124 quad Opamp as a three stage amplifier with gain of +10, -18 and -27. Use a 270 k Ω feedback resistor for all three stages. What output voltage will result for an input of 150 μ V? 7
- b. Describe the following controlled sources :
- i) Voltage controlled voltage source 6
 - ii) Current controlled voltage source
- c. With circuit diagram and frequency response curve, explain first order high pass active filter. 7

UNIT - IV

- 7 a. With block diagram, explain the architecture of 8051 microcontroller. 10
- b. Perform the following :
- i) $(294.6875)_{10} = (\quad)_8 = (\quad)_2$ 6
 - ii) $(458.341)_{10} = (\quad)_{16} = (\quad)_2$
- c. Explain Program Status Word (PSW) in 8051. 4
- 8 a. Explain TMOD and TCON register in 8051. 10
- b. Perform the following :
- i) $(13)_{10} - (25)_{10}$ using 2's complement 6
 - ii) $(25)_{10} - (13)_{10}$ using 1's complement
- c. Define Microprocessor and Microcontroller. 4

UNIT - V

- 9 a. Describe the principle of wireless communication system. 7
- b. Explain the basic cellular system architecture. 7
- c. Define call drop. Why it occurs? 6
- 10 a. With block diagram, explain first generation basic cellular radio network. 10
- b. Explain the cell concept and frequency reuse. 10

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