

USN

18ELN14/24

FirZiNeeOritrSemester B.E. Degree Examination, June/July 2019
Basic Electronics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1
 - a. What is semiconductor diode? Explain the different equivalent circuits of diode. (06 Marks)
 - b. Explain the working of photodiode. (05 Marks)
 - c. With a neat circuit diagram and waveforms, explain the working of full wave bridge rectifier. Also derive V_{dc} and V_r values for full wave rectifier. (09 Marks)

OR

- 2
 - a. A full wave rectifier uses 2 diodes having internal resistance of 200 each. The transformer rms secondary voltage from centre to each end is 50V. Find I_m , I_{dc} , I_{rms} and V_{dc} if the load is 98052 (06 Marks)
 - b. Explain the functional block diagram of 78x x series voltage regulator. (06 Marks)
 - c. Explain how Zener diode can be used as a voltage regulator. Give detail mathematical analysis. (08 Marks)

Module 2

- 3
 - a. With a neat circuit diagram explain the working of CMOS inverter. (06 Marks)
 - b. For a N-channel JFET if $I_{DSS} = 8\text{mA}$ and $V_p = -5\text{V}$, calculate I_D at $V_{as} = -3\text{V}$ and V_{as} at $I_D = 3\text{mA}$. (05 Marks)
 - c. Explain the construction, working and characteristics of N- channel JFET. (09 Marks)

OR

- 4
 - a. Explain the working of SCR using two transistor model. (06 Marks)
 - b. What is commutation in SCR? Explain two types of commutation. (05 Marks)
 - c. Explain the construction, working and characteristics of enhancement type MOSFET. (09 Marks)

Module-3

- 5
 - a. What is Op — AMP? List the characteristics of ideal Op — Amp. (06 Marks)
 - b. Explain how Op — Amp can be used as i) Integrator ii) Voltage Follower. (08 Marks)
 - c. Find the output of the Op — Amp circuit shown in Fig Q5(c) below

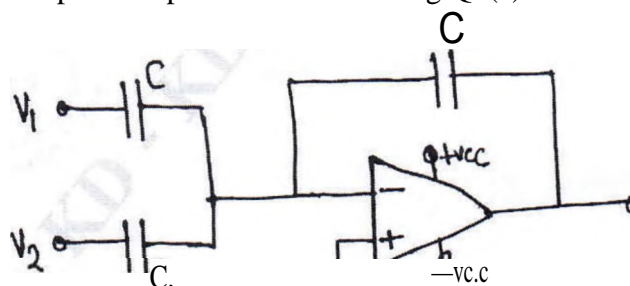


Fig Q5(c)

(06 Marks)

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OR

- 6 a. Explain the following terms with respect to Op — Amp
i) CMRR ii) Slew Rate iii) Output offset voltage iv) Supply voltage Rejection Ratio. (08 Marks)
- b. Design an Op — Amp circuit to obtain output expression as $V_o = -[V_1 + 3V_2 + 5V_3]$. (06 Marks)
- c. Explain how Op — Amp can be used as differentiator. (06 Marks)

Module 4

- 7 a. What is feedback amplifier? What are the properties of negative feedback amplifier? (06 Marks)
- b. Explain how transistor can be used as an amplifier. (06 Marks)
- c. With a neat circuit diagram and waveforms, explain the working of 555 timers as an oscillator. (08 Marks)

OR

- 8 a. Draw the block diagram of voltage series negative feedback amplifier and derive the expression for its voltage gain. (06 Marks)
- b. Design a RC phase shift oscillator for a frequency of 1 KHz. Draw the circuit diagram with designed values. (06 Marks)
- c. With a neat circuit diagram, explain the working of Wein Bridge oscillator. (08 Marks)

Module 5

- 9 a. Perform the following :
i) Convert $(925.75)_{10}$ to base — 2 and base - 16
ii) Subtract from $(11011.11)_2$ from $(10101.11)_2$ using 2's complement method. (06 Marks)
- b. With a block diagram explain the working of 3-bit asynchronous counter. (06 Marks)
- c. What is multiplexer? Implement 8:1 multiplexer using basic gates. (08 Marks)

OR

- 10 a. Simplify $S = A \oplus B$ (DC) and realize using basic gates. (05 Marks)
- b. What is flip-flop? Explain the operation of master slave JK flip flop. (06 Marks)
- c. Implement full adder using two half adders. (04 Marks)
- d. With a block diagram, explain the working of basic communication system. (05 Marks)

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