

First/Second Semester B.E. Degree Examination, June/July 2017

Basic Electronics

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least ONE question from each part.

Module-1

1. a. With a neat circuit diagram and input, output waveforms, explain the operation of a full-wave centre-tapped diode rectifier. (08 Marks)
 - b. Draw common emitter transistor circuit and sketch the input and output characteristics. Also explain active, cut-off and saturation region by indicating them on the characteristic curve. (08 Marks)
 - c. In a common base transistor circuit if $\alpha = 0.99$ and $I_C = 5\text{mA}$, compute the values of β and I_B . (04 Marks)
2. a. Explain with a neat circuit diagram, input and output waveforms working of negative series clipper and positive clamper. (08 Marks)
 - b. In a half wave rectifier, the input is from 30V, transformer. The load and diode forward resistances are 100Ω and 10Ω respectively. Calculate the I_{DC} , I_{rms} , P_{DC} , P_i , η , PIV and regulation factor. (08 Marks)
 - c. Establish the relation between ' α ' and ' β ' of a transistor amplifier. (04 Marks)

Module-2

3. a. With a neat circuit diagram, explain voltage divider bias circuit by giving exact analysis. (08 Marks)
 - b. Explain with circuit diagram how Op-Amp can be used as an inverting amplifier and integrator. (08 Marks)
 - c. What are ideal characteristics of an Op-Amp? (04 Marks)
4. a. Explain with circuit diagram how Op-Amp can be used as :
i) Non-inverting amplifier ii) inverting summer and iii) voltage follower. (10 Marks)
 - b. Find the output of the following Op-Amp circuits. (10 Marks)

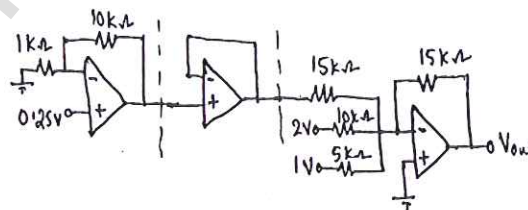


Fig.Q4(b)(i)

ii)

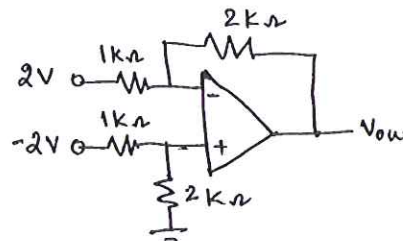


Fig.Q4(b)(ii)

Module-3

- 5 a. Write symbol and truth tables of AND, OR, EX-OR and NOT gates. (08 Marks)
 b. Draw full adder using two half-adder and write its truth table. (08 Marks)
 c. Realize basic gates from NOR gate. (04 Marks)
- 6 a. Convert : i) $(655.70)_8 = ()_{10} = ()_{16}$
 ii) $(238.20)_{10} = ()_8 = ()_2$. (08 Marks)
 b. Perform the following :
 i) $(11010)_2 - (10111)_2$ using 1's complement method
 ii) $(111001)_2 - (101011)_2$ using 2's complement method. (08 Marks)
 c. Simplify the Boolean function $F = \overline{A}BC + A\overline{B}C + ABC$. (04 Marks)

Module-4

- 7 a. Draw NAND gate latch, write logic symbol and truth table explain its operation. (08 Marks)
 b. List any four differences between microprocessor and microcontroller. (08 Marks)
 c. Define flip-flop. Give the difference between latch and flip-flop, (04 Marks)
- 8 a. With a neat block diagram, explain the architecture of 8085 microprocessor. (10 Marks)
 b. Explain : i) Hall effect ii) seebeck effect iii) peltier effect. (06 Marks)
 c. What is transducer? Distinguish between active and passive transducer. (04 Marks)

Module-5

- 9 a. Define AM. Draw AM signal and its spectrum. Derive an expression for total power in terms of carrier power and modulation index. (10 Marks)
 b. Draw and explain the basic fibre optic communication system. Explain each basic elements used in it. (06 Marks)
 c. Give any four comparisons between AM and FM. (04 Marks)
- 10 a. What is ISDN? Explain the services of ISDN. (08 Marks)
 b. With a block diagram explain typical cellular mobile radio unit. (08 Marks)
 c. Write any four needs for modulation. (04 Marks)

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