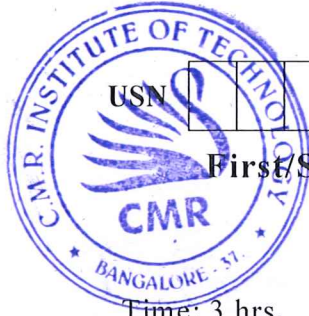


CBCS SCHEME



15ELN15/25

First/Second Semester B.E. Degree Examination, June/July 2019 Basic Electronics

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Draw forward and reverse V- I, characteristics of Si and Ge diodes and make any two comparison between Si and Ge diodes. (04 Marks)
- b. With a neat circuit diagram, input and output waveforms, explain the working of an Half wave diode rectifier. (06 Marks)
- c. A full-wave rectifier supplies a load of 1000Ω . The ac voltage applied to it is $200-0-200$ V(rms). Calculate i) I_{DC} ii) I_{rms} iii) efficiency (η), Assume $R_f = 0\Omega$. (06 Marks)

OR

- 2 a. Define ' α ' and ' β ' of a transistor amplifier and derive the relation between α and β . (04 Marks)
- b. With a neat circuit diagram, input and output waveforms, explain the operation of a Full wave two diode rectifier. (06 Marks)
- c. Draw an output characteristics of CE-transistor amplifier, mark different regions of working on it, explain each region of working. (06 Marks)

Module-2

- 3 a. With a neat sketch and equations, explain what is dc load line and bias point in a CE base bias amplifier. (04 Marks)
- b. Explain with neat circuit diagram and equations, voltage divider bias amplifier. (06 Marks)
- c. Design bias-bias transistor circuit, using 'Si' transistor having ' β ' value of 100, V_{CC} is 10V, and dc bias conditions are to be $V_{ce} = 5v$ and $I_c = 5mA$. (06 Marks)

OR

- 4 a. Define CMRR and slew rate and write any four ideal characteristics for op-amp. (04 Marks)
- b. With a neat circuit diagram, derive an equation for op-amp application as
 - i) Inverting amplifier
 - ii) Non-inverting amplifier
 - iii) Inverting 2-input summer
 - iv) Subtractor
 - v) Integrator
 - vi) Differentiator.(12 Marks)

Module-3

- 5 a. Convert $(1101010)_2 = ()_{10}$ and $(65)_{10} = ()_2$ (04 Marks)
- b. Convert $(ABCD)_{16} = ()_8$ and $(16000)_8 = ()_{16}$ (04 Marks)
- c. Write the truth table, design equations and circuit diagram of an Half adder using logic gates. (08 Marks)

OR

- 6 a. State and prove De Morgan's Theorem for 3-variables. (04 Marks)
- b. Realize AND, OR and EX-OR gates using NAND gates. (06 Marks)
- c. Perform the following subtraction using 1's and 2's complement, $(10111001)_2 - (1011)_2$. (06 Marks)

Module-4

- 7 a. Compare flip-flop and Latch. (02 Marks)
b. With circuit diagram and truth table explain the working of a NAND gate latch. (07 Marks)
c. Explain the operation of clocked RS-flip flop, with circuit diagram and truth table. (07 Marks)

OR

- 8 a. Explain with circuit diagram and truth table working of NOR gate latch. (06 Marks)
b. Draw the architecture of 8051 microcontroller, explain the function of each block used in it. (10 Marks)

Module-5

- 9 a. Draw the block diagram of communication system, explain the functions of each block used in it. (05 Marks)
b. Define amplitude modulation and derive equation of amplitude modulated double side band wave. (05 Marks)
c. A carrier of 2MHz has 1kW of its power amplitude modulated with a sinusoidal signal of 2KHz, the depth of modulation is 60%. Calculate the side band frequencies, signal band width, power in side bands, and total power of modulated wave. (06 Marks)

OR

- 10 a. Distinguish between active and passive transducers. (02 Marks)
b. Bring out any four differences between amplitude modulation and frequency modulation. (04 Marks)
c. Explain with neat diagram working of LVDT. (10 Marks)

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