Model Question Paper (CBCS) with effect from 2015-16

USN | | | | | | | | | | 15ELN15/25

First/Second Semester B.E. Degree(CBCS)Examination

Basic Electronics

Time: 3 hrs. Max. Marks: 80

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

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Define following diode parameters:
i) PIV ii) Knee voltage iii) Dynamic resistance. **(06 Marks)**

b. With neat circuit diagram and waveforms, explain the working of a half wave rectifier. **(06 Marks)**

c. Draw common emitter circuit and sketch the input and output characteristics. Also explain operating regions by indicating them on characteristics curve. **(04 Marks)**

OR

2 a. Explain zener diode voltage regulator circuit with no load and with load. **(06 Marks)**

b. The i/p to the Full wave rectifier is v(t) = 200 sin50t. If R_L is 1kΩ and forward resistance of diode is 50Ω, find:
i) D.C current through the circuit
ii) The A.C (rms) value of current through the circuit
iii) The D.C output voltage
iv) The A.C power input
v) The D.C power output
vi) Rectifier efficiency. **(06 Marks)**

c. Derive the relationship between α and β. Calculate the value of I_c, I_e for a transistor that has $\alpha = 0.98$ and $I_b = 100\mu A$. **(04 Marks)**

Module-2

3 a. What is a Dc load line? Explain Base biased method with necessary equations. **(05 Marks)**

b. Explain the characteristics of an Ideal Op-amp. Mention two applications of Op-Amp. **(06 Marks)**

c. With a neat circuit diagram, explain the Voltage Divider Bias circuit using approximate analysis. **(05 Marks)**

OR

4 a. Design the voltage divider bias circuit to operate from 12 V supply. The bias conditions are V_{CE}=3V, V_E=5V, and I_c = 1mA. **(05 Marks)**

b. Derive the expression of 3 input summing amplifier. **(05 Marks)**

c. Explain voltage follower with neat circuit and necessary equations. **(06 Marks)**

Module-3

5 a. Convert $(1101101)_2 = (\qquad)_{10}$ and $(69)_{10} = (\quad)_2$. **(04 Marks)**

b. Convert $(1010111011110101)_2 = (\quad)_{16}$ and $(FA876)_{16} = (\quad)_2$ **(04 Marks)**

c. State and prove Demorgan's Theorem. **(08 Marks)**

OR

6 a. Factorise the following Boolean equations $Y_1 = A\overline{B} + AB$, $Y_2 = (B + CA)(C + \overline{A}B)$. **(06 Marks)**

b. Realise half adder using NAND gates only. **(05 Marks)**

c. Write a note on Full Adder. **(05 Marks)**

Module-4

7 a. Write a short note on clocked RS Flip-Flop. **(04 Marks)**

b. Explain the architecture of 8051 microcontroller. **(06 Marks)**

c. Explain the operation of NOR gate latch using its truth table. **(06 Marks)**

OR

8 a. What is a RS Flip-Flop? Explain using its circuit diagram, logic symbol and truth table. **(06 Marks)**

b. Using a block diagram, explain microcontroller based stepper motor control system. **(06 Marks)**

c. Draw the traditional and IEEE logic symbol of AND, NOT, NOR, XOR and XNOR. **(04 Marks)**

Module-5

9 a. With a neat block diagram, explain the elements of communication systems. **(05 Marks)**

b. Explain the construction and the principle of operation of LVDT. **(05 Marks)**

c. Bring out the differences between amplitude modulation and frequency modulation. **(06 Marks)**

OR

10 a. Explain frequency modulation with neat waveforms. **(05 Marks)**

b. Derive equations for Amplitude Modulation and sketch the necessary waveforms. **(05 Marks)**

c. A500 W, 100KHz carrier is modulated to depth of 60% by modulating signal of frequency 1KHz.Calculate the total power transmitted. What are the side band components of the AM wave? **(06 Marks)**

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