



Motilal Nehru National Institute of Technology Allahabad
Department of Electronics & Communication Engineering
Analog and Digital Electronics (EC-13103)
End Semester Examination (Dec-2018) 2018-19
B.Tech 2nd Year CSE/IT (Semester-III)

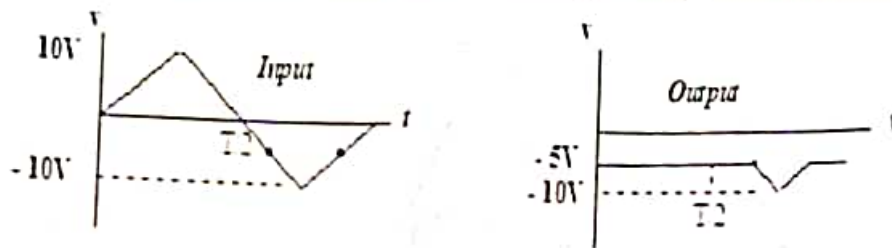
Time: 3 Hours.

Max Marks: 60

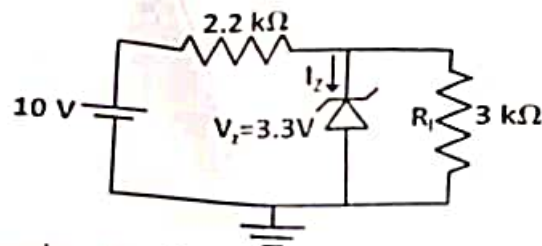
All questions are compulsory

(Assume suitable values of missing data; Symbols and notations carry their usual meaning.)

- Q.1. Define the following terms: (i) Peak inverse voltage (ii) Reverse saturation current (iii) Cut off voltage (iv) Intrinsic semiconductor (v) Pinch off voltage (vi) Diffusion capacitance 6
- Q.2. (a) Explain clipper and clamper circuit in brief. 6
- (b) Input and output waveform of a clipper circuit is given below. Draw the required circuit



- Q.3. (a) Explain Avalanche and Zener breakdown in detail. 6
- (b) In the Figure shown below, Calculate (i) Current drawn from the source (ii) Current through Zener diode (iii) load current.

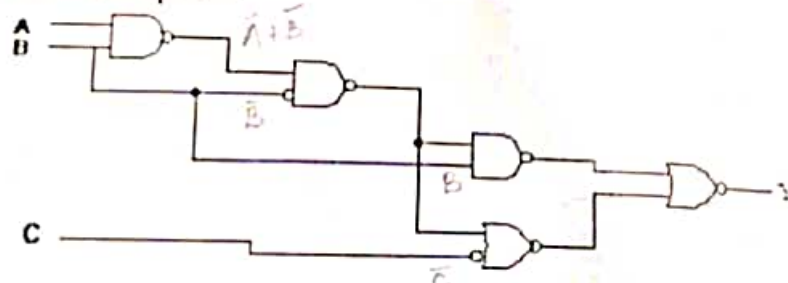


- Q.4. (a) Simplify the Boolean function F using don't care condition d , in Sum of products form and implement the function by using NAND gate only. 6

$$F = \overline{B}C\overline{D} + B\overline{C}\overline{D} + ABC\overline{D}$$

$$d = \overline{B}C\overline{D} + \overline{A}B\overline{C}\overline{D}$$

- (b) What are min term and max term? For the logic circuit shown in figure, find the simplified Boolean expression for the output Y .

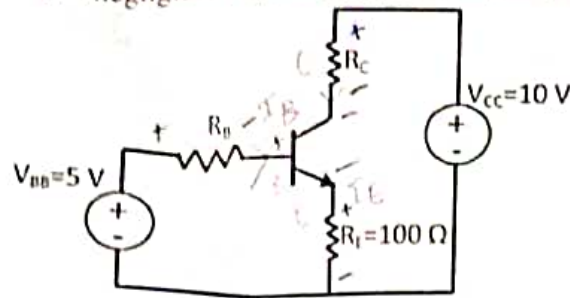


- Q.5. (a) What are the advantages of FET over BJT? Explain the working of BJT amplifier 6
- (b) Explain thermal runaway and base width modulation in detail.

Q.6. (a) Why biasing is required in transistors? Explain self-biasing in detail.

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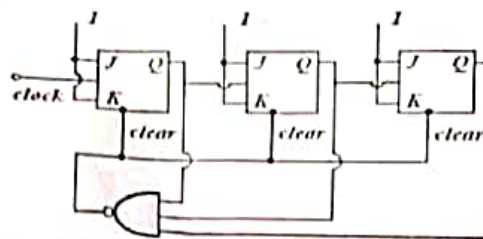
(b) Find R_B & R_C in the circuit shown such that $I_C = 9.5 \text{ mA}$ and $V_{CE} = 5 \text{ V}$ with $\beta = 100$, $V_{BE} = 0.7 \text{ V}$ and negligible reverse saturation current is under consideration.



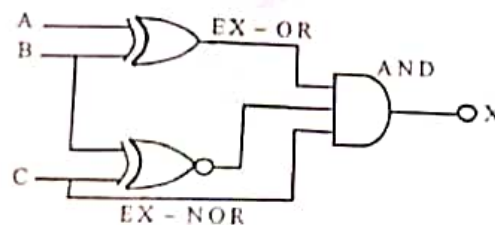
Q.7. Explain the following (i) Decoder (ii) PLA (iii) ROM

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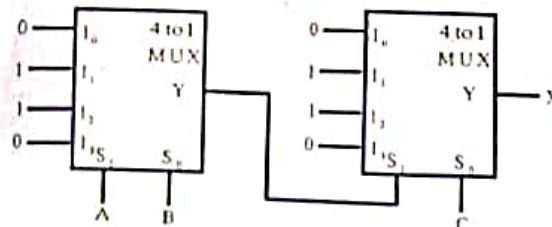
Q.8. What do you mean by counter circuit? Explain the working of the sequential circuit shown in the figure with the help of clock diagram.



Q.9. (a) What are universal gates? For the logic circuit shown below, what is the required input condition (A, B, C) to make output $X = 1$?



(b) Define multiplexer. Compute the value of output X in the given circuit



Q.10 (a) Compare between CE, CB and CC configuration mode of transistor for various parameters.

(b) Derive an expression for rectification efficiency of full wave rectifier.