

[Time: 3 Hours]

[Marks:80]

- Instructions: 1) Question No. 1 is compulsory.
 2) Answer **any three** from **remaining five**.
 3) Assume data where ever needed.

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|---|----|---|----|
| 1 | a) | Draw the circuit diagram of fixed voltage regulator using IC 78XX series | 5 |
| | b) | Explain the block diagram of Opamp in brief | 5 |
| | d) | Convert JK to T flip flop. | 5 |
| | e) | Explain and mention universal gates | 5 |
| 2 | a) | Explain the operation of Monostable multivibrator using IC 555 .Draw the circuit diagram and waveforms. | 10 |
| | b) | Explain with the help of circuit diagram the operation of an OPAMP as inverting amplifier. Derive expression for the voltage gain of this amplifier | 10 |
| 3 | a) | Design a mod-9 asynchronous counter using JK flip flop | 10 |
| | b) | Minimize the expression using K map and implement using AND gates only.
$F = \Sigma(0,5,9,12,13,14,15)$ | 10 |
| 4 | a) | With the help of neat diagram explain the operation of any DAC. | 10 |
| | b) | Explain briefly the operation of TTL NAND gate in tristate output configuration | 10 |
| 5 | a) | Implement following expression using (i) 16:1 Mux (ii) 8:1 Mux
$F(A,B,C,D) = \Sigma(0,2,5,6,7,9,12,15)$ | 10 |
| | b) | With neat circuit diagram and waveforms explain inverting Schmitt trigger using opamp | 10 |
| 6 | a) | Explain look ahead adder. | 10 |
| | b) | Derive the filter gain of first order high pass filter and draw its frequency response characteristics | 10 |