

[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.

O.P.Code: 25663

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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.<br>$F = \Sigma(0,5,9,12,13,14,15)$  | 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<br>$F(A,B,C,D) = \Sigma(0,2,5,6,7,9,12,15)$  | 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 |

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