

5476

QP Code:

Time : 3 Hours

Max. Marks: 80

## NOTE:

1. Question No. 1 is compulsory.
2. Solve any **Three** questions from remaining five.
3. Assume suitable data wherever necessary.

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|----|----|---|----|
| Q1 | a) | State and prove Demorgans theorem.  | 5  |
|    | b) | List ideal characteristics of OPAMP.  | 5  |
|    | c) | Convert JK to T flip flop.  | 5  |
|    | d) | Explain in brief types of registers.  | 5  |
| Q2 | a) | Explain the operation of Astable 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 |
| Q3 | a) | Design a mod-10 asynchronous counter using JK flip flop   | 10 |
|    | b) | Minimize the expression using K map and implement using NOR gates only.<br>$F = \Sigma(0,5,9,12,13,14,15)$  | 10 |
| Q4 | a) | With the help of neat diagram explain the operation of R-2R ladder type DAC.  | 10 |
|    | b) | Explain ECL logic family.   | 10 |
| Q5 | a) | Implement following expression using (i) 8:1 Mux (ii) 4:1 Mux<br>$F(A,B,C) = \Sigma(0,2,5,6,7)$   | 10 |
|    | b) | Explain ideal and practical integrator  | 10 |
| Q6 | a) | Design and implement 3bit gray to binary code converter.  | 10 |
|    | b) | Derive the filter gain of first order low pass filter and draw its frequency response characteristics.  | 10 |