

(3 Hours)

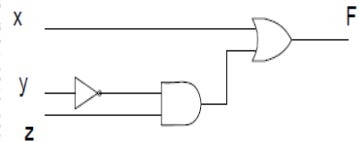
[Total Marks:80]

- N.B.** (1) Question no.1 is **compulsory**.
 (2) Attempt **any three** from the rest.
 (3) Make any suitable assumption wherever required.

Q.1 Answer any FOUR of following

- (a) Give the ideal and practical values of the following parameters 5M
 a) CMRR b) Slew Rate c) Input Resistance d) Output Resistance
 e) PSRR
- (b) For a inverting summing amplifier if $R_f = 5K\Omega$, $R_1 = 1K\Omega$, $R_2 = 2K\Omega$ and $R_3 = 5K\Omega$ 5M
 with supply voltage of $\pm 12V$ if following inputs are applied calculate the output voltage if
 I) $V_1 = 3mV$, $V_2 = 4mV$ and $V_3 = 6mV$
 II) $V_1 = 3V$, $V_2 = 4V$ and $V_3 = 6V$
- (c) I) Simplify the following 5M

$$\overline{AB} + \overline{ABC} + \overline{A}B + C$$
- (d) Write the output equation for following and prepare the truth table of F1 for 5M
 possible values of X, Y and Z.



- (e) Convert i) $(C9.A2)_{16}$ to binary, octal and decimal 5M
 ii) $(47.31)_{10}$ to hexadecimal
- (f) Draw and explain V to I converter using Op-amp 5M

- Q.2** (a) Draw and explain op-amp as Integrator. Also draw its input and output 10M
 waveforms with its frequency response
 (b) Implement the following function using 3 data select input multiplexer 10M
 $f(A,B,C,D) = \sum m(0,2,3,5, 6,8,10,14)$

- Q.3** (a) Give the block diagram of IC-555 and explain the function of each pin 10M
 (b) Convert i) JK Flip flop to T Flip flop 10M
 ii) T to D Flip flop

- Q.4** (a) Draw and explain First order Butterworth Low Pass Filter with its practical 10M
 frequency response.
 (b) Design 4 bit asynchronous counter using J-K flip flop 10M

- Q.5** (a) How op-amp can be used as Inverting Schmitt Trigger. Explain it with neat 10M
 diagram and waveforms.
 (b) Simplify the following using K-map implement using gates 10M
 $f(A,B,C,D) = \sum m (0,2,3,5,9,13,14) + d(4,7,10)$

Q.6 Write short note on any **TWO** of the following. 20M

- (a) Shift Register
 (b) Sample and Hold Circuit using Op-Amp
 (c) Binary to Gray Code converter