Code No.: **10412/20412** **MR12/MR11**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Integrated Circuits & Applications**

Branch: **EEE**

Time: 3 hours **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15 Marks= 75 Marks**

1. a) Explain about CMRR and SVRR of an op-amp.
   b) What are the features of IC 741?
2. a) Draw the circuit diagram for Schmitt trigger and explain it's working with waveforms. **[5M]**
   b) Explain the characteristics of comparator and how they are used in limiter circuits with neat circuit diagram and waveforms. **[7M]**
   c) Design op-amp differentiator for I/P signal fmax=100 Hz,(square wave) amplitude of IVpeek to peak. Draw the O/P wave forms. **[3M]**
3. a) Explain the wein bridge oscillator circuit using OP-AMP. **[8]**
   b) Design a wide band pass filter with f_l=200Hz, f_h=1 **KHz** and a pass band gain is 4. Calculate the `Q' factor for a filter. **[7]**
4. a) Draw the Block schematic of PLL and explain about each block separately. **[8M]**
   b) If RA= 6.8 KΩ, RB=3.3K,C=0.1μf values of 555 IC A stable Multivibrator. Calculate i) t high ii) t low iii) free Running frequency (fo) iv) duty cycle. **[7M]**
5. a) Explain successive approximation type ADC with neat sketches
   b) Explain about the specifications of DAC.
6. a) Explain the characteristics & parameters of 74TTL IC's & compare the parameters with respective to TTL, ECL & CMOS. **[8]**
   b) Explain about CMOS NAND and CMOS Tristate Inverter. **[7]**
7. a) List out the different 74 IC numbers for Data selectors. Explain about IC 74157 with one application. **[8]**
   b) Draw the Pin diagram, Logic diagram & Truth table for 1C74138 & Design 4 to 16 Decoder by using 74138. **[7]**
8. a) Convert a T-flip flop into a D-flip flop and explain its operation. **8M**
   b) Convert a D-flip flop into a T-flip flop and explain its operation. **7M**

Code No.: 10211/2211 **MR11/MR12**

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY - 2019

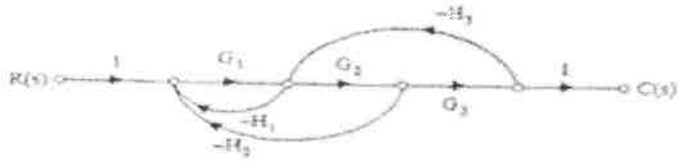
Subject: **Control Systems**

Branch: **Common to EEE & ECE**

Time: 3 hours **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15 Marks= 75 Marks**

1. a) Define Transfer function and write its limitations? **[7M]**
   b) What is closed loop control systems and explain the characteristics of feedback? **[8M]**
2. a) Explain the rules in Block diagram reduction technique. **[8M]**
   b) Obtain the transfer function for the following signal flow graph **[7M]**



3. Evaluate static error constants for unity feedback system having a forward path T.F $G(s)=\frac{50}{S(S+10)}$. Estimate steady state errors for input given by $r(t)=1+2t+t^r$.
4. A unity feedback control system is characterized by $G(s) = \frac{K}{S^2(S+2)}$
   a. Show that the system is always unstable
   b. Show that the system is always stable if a zero (s+a) is added to above T.F where o<a<2.
5. a) What is frequency response analysis
   b) Determine phase margin and gain margin using bode plot for T.F of
   $G(s)=\frac{40(s+1)}{(s2+2s+4)(1+5s)}$
6. Using Nyquist stability criterion, find range of 'K' for closed loops system stability for $G(s)H(s) = \frac{K(4s+1)}{S(S-1)}$; K>0
7. a) What is compensation
   b) Explain different types of compensation networks clearly.
8. a) What is diagonalisation
   b) Obtain the state transition matrix $\phi(t)$ for the following system

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$