Hall Ticket Number :										

R-15

Code: 5G345

II B.Tech. II Semester Supplementary Examinations May/June 2022

Electronic Circuit Theory

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) Explain the h-parameter representation of transistor amplifier. 6M
   b) Compare the transistor amplifier configurations 8M

OR

2. a) How two amplifiers are cascaded using coupling? 4M
   b) Give the complete analysis of RC coupled CE amplifier. 10M

UNIT–II

3. a) Explain about hybrid- pi conductances. 7M
   b) Explain CE short circuit current gain. 7M

OR

4. a) Derive expression for gain band width product for voltage of transistor. 7M
   b) Obtain the expression for short circuit current gain of CE amplifier 7M

UNIT–III

5. a) Explain the General Characteristics of negative feedback amplifier. 8M
   b) Explain various topologies of feedback amplifiers. 6M

OR

6. An amplifier has a mid-frequency gain of 100 and a bandwidth of 200KHz.
   a) What will be the new bandwidth and gain, if 5% negative feedback is introduced?
   b) What should be the amount of feedback, if the bandwidth is to be restricted to 1MHz? 14M

UNIT–IV

7. a) Write down the general applications of oscillators. 4M
   b) Derive the general form for frequency of oscillations for LC oscillator with suitable diagram. 10M

OR

8. a) Explain the operation of RC phase shift oscillator using BJT and derive the equation for frequency of oscillation. 10M
   b) Mention the advantages and disadvantages of RC phase shift oscillators 4M

UNIT–V

9. a) Define Q-factor and compare various tuned amplifiers. 6M
   b) Explain the operation of a single tuned capacitance coupled amplifier circuit and its frequency response 8M

OR

10. a) Discuss the classification of tuned amplifiers 4M
    b) Draw the circuit diagram of Single tuned inductive coupled amplifier and explain its operation. 10M

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Hall Ticket Number :										

R-15

Code: 5G244

II B.Tech. II Semester Supplementary Examinations May / June 2022

Linear Control Systems

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

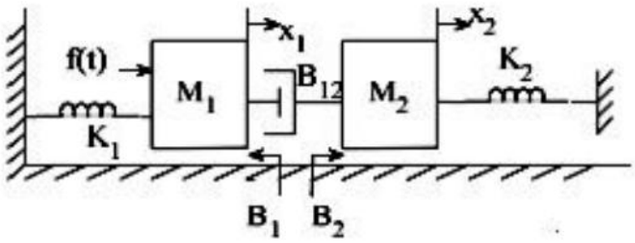
1. a) Define Signal flow graph. Why do we choose SFG over block reduction techniques? State the advantages of SFG. Explain Mason's gain 7M

   b) Draw the signal flow graph for the following equations

   $x_2+5x_3-2x_1=0 \quad X_3+2x_4-4x_2=0 \quad X_4-8x_3=0$ 7M

OR

2. For the mechanical system shown below, derive the transfer functionX1(s)/F(s). Also draw the force-voltage and force-current analogous circuits.



14M

UNIT–II

3. The open loop transfer function of a unity feedback system is given by $G(s) = \frac{K}{S(TS+1)}$.Where K and T are positive constants. By what factor should the amplifier gain be reduced so that the peak overshoot of the unit step response of the system is reduced from 75% to 25%. 14M

OR

4. Explain the effect of proportional, integral, derivative Controllers, their advantages and disadvantages 14M

UNIT–III

5. a) Explain about BIBO stability. 7M

   b) What are the difficulties in forming Routh array? Explain how to overcome. 7M

OR

6. Given the unity feedback system whose open loop transfer function is $G(s) = \frac{KS(2+S)}{(S^2-4S+8)(S+3)}$. Determine the range of K for stability. 14M

UNIT–IV

7. a) Define GM & PM. 7M

   b) List the advantages and disadvantages of Frequency response 7M

OR

8. a) Sketch the polar plot for the system with open loop transfer function $G(s)H(S) = \frac{1}{(S+2)(S+4)}$.Determine Phase margin and Gain margin 14M

UNIT–V

9. a) Explain the controllability and observability with an example. 14M

OR

10. a) Estimate the complete state controllability and observability of the system $A=\begin{bmatrix}-1 & 1 & 0\\ 0 & -4 & 2\\ 0 & 0 & -10\end{bmatrix}; B=\begin{bmatrix}1\\0\\-1\end{bmatrix}; C=\begin{bmatrix}1 & 0 & 1\end{bmatrix}$. Also find the transfer function and output of the system. 14M

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