Hall Ticket Number :										

R-11 / R-13

Code: 1G244

II B.Tech. II Semester Supplementary Examinations May 2019

Linear Control Systems

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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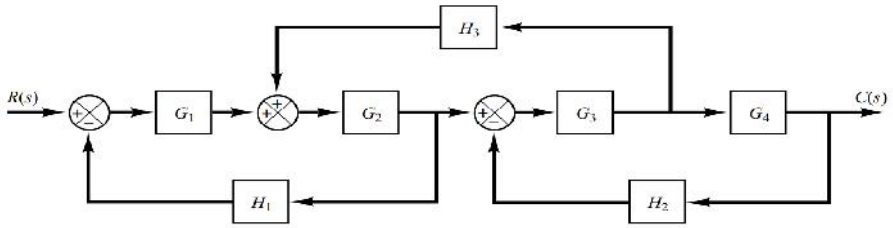
1. a) Define open loop and closed loop control system. 4M

   b) Explain open loop and closed loop Temperature control system with neat sketches. 10M

2. Minimize the block diagram shown in Figure. Then obtain the closed-loop transfer function C(s)/R(s) using Block Diagram reduction technique.



. 14M

3. Define Delay time, Rise time, Peak time, Maximum overshoot, Settling time with a neat sketch. And derive expression for any two of the above. 14M

4. a) Define Root Locus. 4M

   b) Write the Procedure to Plot Root Locus. 10M

5. a) Explain about the Frequency domain specifications. 8M

   b) Derive the expression for Resonant peak. 6M

6. a) Define Polar plot. 4M

   b) Explain the procedure to determine the Gain margin and Phase margin from Polar plot. 10M

7. Explain in detail about different controllers employed in control systems and their effects on system performance. 14M

8. a) Explain about the concept of state, state variables and obtain the state model-derivation of state model for state equation. 8M

   b) Draw the block diagram of the State Model of a system. 6M

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Hall Ticket Number :										

R-11 / R-13

Code: 1GC41

II B.Tech. II Semester Supplementary Examinations May 2019

Mathematics-III

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. Prove that $(m,n)=\dfrac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$

2. a) Apply C-R conditions to $f(z)=z^2$ and show that the function is analytic everywhere.

   b) Suppose $f(z)=u+iv$ is an analytic function and $u=x\left(x^2-3y^2\right)$, find its harmonic conjugate $v(x,y)$.

3. a) State the Real and Imaginary parts of $Cos\, z$

   b) If $\tan(x+iy)=A+iB$, then show that $A^2+B^2+2A\,Cot\,2x=1$.

4. *Evaluate* $\int_0^{1+i}\left(x-y+ix^2\right)dz$ along real axis from z = 0 to z =1 and then along the line parallel to imaginary axis from z =1 to z =1+i

5. Find the Laurent Series Expansion of $f(z)=\dfrac{1}{(z+1)(z+3)}$ for $1<|z|<3$.

6. Determine to poles of the function $f(z)=\dfrac{1}{(z-1)(z-3)}$ and find the residue at each pole.

7. State and prove Fundamental theorem of algebra.

8. Find a bilinear transformation which maps the point's $z=1,\ i,-1$ onto the points $w=0,1,\infty$.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G341

II B.Tech. II Semester Supplementary Examinations May 2019

Signals and Systems

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. a) Discuss about Elementary signals with necessary functional and graphical representations.
   b) Discuss about Orthogonality in complex functions

2. a) State and Prove Convolution property and parseval's relation of Fourier series
   b) Elucidate the following Properties of Fourier series
      i) Time reversal
      ii) Time scaling
      iii) Differentiation

3. a) Evaluate the Fourier transform of any two standard signals
   b) Determine the Fourier Transform of i) coswt u(t) ii) sinwt u(t)

4. a) Find whether the following system are static or dynamic
      i) $y(t)= x(t^2)$ ii) $y(t)=e^{x(t)}$
   b) Explain Transmission of signals through LTI systems

5. a) Establish the relationship between Autocorrelation and Power Spectral Density
   b) Derive the relationship between convolution and Correlation

6. a) Define Aliasing effect and Explain the effect of aliasing on sampling.
   b) Explain how the original signal can be reconstructed from the sampled version.

7. a) Find the laplace transform of the following signal x(t)= sin πt for 0 from t < t<1 & 0 for otherwise
   b) Derive the relationship between Laplace and Fourier Transform

8. a) Discuss Fundamental difference between continuous and discrete time signals
   b) Derive the relationship between Z-Transforms and DTFT

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Hall Ticket Number :										

R-11 / R-13

Code: 1G236

II B.Tech. I Semester Supplementary Examinations May 2019

Electrical Circuit Theory

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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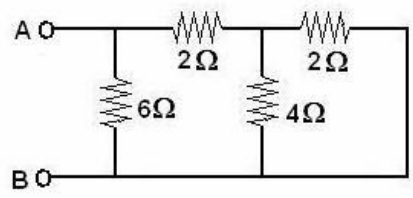
1. a) Determine the equivalent resistance between A and B of the network shown below.



   b) Explain source transformation with examples

2. a) A resistance R is connected in series with a parallel circuit comprising two resistances of 12Ω and 8Ω. The total power dissipated in the circuit is 700 Watts when the applied voltage is 200 V. Calculate the value of R.

   b) By taking any one example write down the procedure to obtain node voltages by using nodal analysis.

3. a) Define the following terms

      i) Cycle ii) Amplitude iii) Phase iv) Form factor

   b) Derive the RMS and average value of a sinusoidal current waveform. Hence find form factor and amplitude factor

4. a) State the properties of series R-L-C Resonance circuit and obtain the Resonance frequency?

   b) A RLC series circuit consists of R = 50Ω L = 0.16H and C = 4 μF. Calculate resonant frequency, quality factor, band width and half power frequencies.

5. a) What are the advantages of three phase system over single phase system?

   b) Three identical impedances of (3+j4)Ω are connected in delta. Find an equivalent star network such that the line current is the same when connected to the same supply.

6. a) Define MMF, Flux density, Magnetizing force and Permeability and specify merits for each of the above quantities.

   b) The combined inductance of two coils connected in series is 0.6H or 0.1H, depending upon the relative directions of the currents in the coils. If one of the coils when isolated has a self-inductance of 0.2H, Calculate

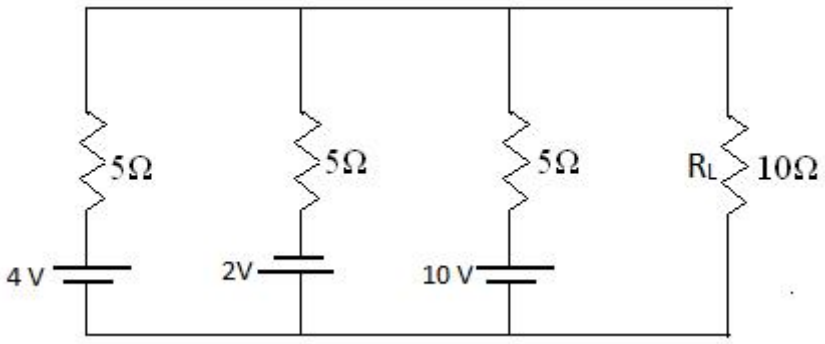
      i. Mutual inductance, and

      ii. The Coefficient of coupling

7. a) State and explain thevenin's theorem.

   b) State Maximum Power Theorem and derive the condition for Maximum Power Transferred from Source to the resistive load?

8. Find the current through load resistance R_L and also find the voltage drop across load using Millman's theorem for the network as shown in fig



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