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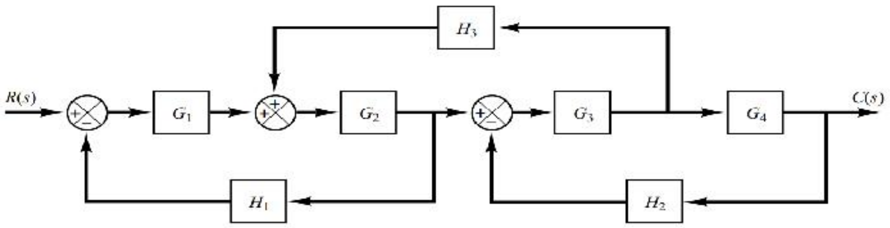
1. a) Define open loop and closed loop control system. 4M

   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 $A^2+B^2+2ACot\,2x=1$.

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: 1G343

II B.Tech. II Semester Supplementary Examinations May 2019

Pulse and Digital Circuits

(Electrical and Electronics 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 upper 3-dB frequency for low pass RC circuit, if a pulse of 0.5μsec is required to pass without distortion. Find the value of resistance if the capacitor is 0.001μF. 4M
   b) List out the applications of attenuator. What is the role of attenuator in CRO probes? 6M
   c) How a low pass circuit acts as an integrator? Explain. 4M

2. a) With neat diagram and derivation explain the working of a clipping circuit at two independent levels. 7M
   b) Draw and explain the working of a diode comparator. 7M

3. a) Explain with relevant diagram the various transistor switching times. 7M
   b) List out the applications of a diode and explain the operation of a diode switch. 7M

4. a) Derive expressions for LTP and UTP of a Schmitt trigger. 7M
   b) With a neat diagram explain the operation of a monostable multivibrator. 7M

5. a) Find the component values of a bootstrap sweep generator, Given VCC = 18V, IC(sat) = 2 mA and hFE(min) = 30. 8M
   b) With neat sketch, explain about transistor miller time base generator 6M

6. a) With the help of the diagram, explain the working principle of a bidirectional diode sampling gate? 7M
   b) Explain the operating principle of a basic sampling gate. 7M

7. a) Explain synchronization of a sweep generator with pulse signals 7M
   b) Write short notes on frequency division with Astable multivibrator. 7M

8. a) Draw and discuss the circuit diagram for Diode two input OR gate 6M
   b) With the help of a neat circuit diagram for NAND gate using ECL logic and explain. 8M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G234

II B.Tech. I Semester Supplementary Examinations May 2019

Electro Magnetic Fields

(Electrical and Electronics 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) State and explain vector form of Coulombs law.

   b) Three equal point charges 10^{-4} C each are located at the corner of a square side 4m. Determine the magnitude and direction of force at the vacant corner having the charge of 4 µC.

2. a) Derive an expression per energy density in an electro static field.

   b) The point charges -2nC, 8nC, and 6nC are located at (0,0,0) (0,0,2), and (2,0,0) respectively. Find energy in system.

3. a) Derive the integral form of continuity equation.

   b) Explain Polarization of dielectric materials.

4. a) State and explain Biot-savart's law.

   b) Using Biot-savart law, find an expression for the magnetic field intensity in the vicinity of a straight current carrying conductor of finite length.

5. a) Using Ampere's law Determine the magnetic field intensity of coaxial cable

   b) List out limitation of Ampere's circuital law.

6. a) Derive the expression for the torque experienced by the current carrying loop placed in a magnetic Field.

   b) A Rectangular coil of area $10cm^2$ carrying current of 50A lines on plain 2x+6y-3z=7. Such that the magnetic moment of the coil directed away from the origin. Evaluate the magnetic moment.

7. a) Determine self-inductance of a co-axial cable of inner radius a and outer radius b.

   b) Explain B-H curve of magnetic field

8. a) Explain Faraday's laws of Electromagnetic Induction and Derive the expression for induced emf.

   b) Explain the significance of Displacement current.

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