Hall Ticket Number :										

R-11 / R-13

Code: 1G244

II B.Tech. II Semester Supplementary Examinations Nov/Dec 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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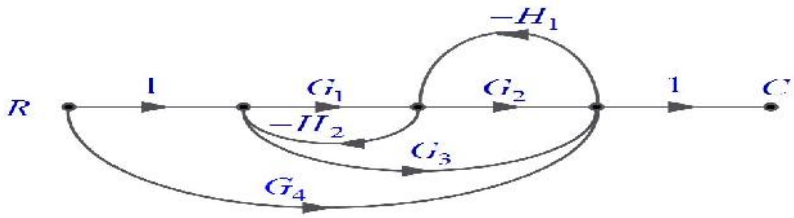
1. Explain in detail about the classification Systems.

2. a) Explain Masons gain formula in detail

   b) And also obtain the transfer function using Masons gain formula for the signal flow graph shown below.



3. a) Explain in detail about Test Signals with figures and also discuss their importance.

   b) A servomechanism has its moment of inertia $10x10^{-6}$ Kg-m^2, retarding friction $400x10^{-6}$ Nm/rad/sec. The output torque is 0.004 Nm/rad error. Find the natural frequency and damping factor of the system.

4. a) Determine the stability using Routh Criterion of the closed loop transfer function

$$G(s) = \frac{10}{S^5 + 2S^4 + 3S^3 + 6s^2 + 5S + 3}.$$

   b) Explain about BIBO stability.

5. a) Define Bode plot.

   b) Discuss about basic factors while drawing the bode plot

6. a) Define Type number and order number of a system.

   b) Sketch the polar plot for the feedback system whose OLTF is $G(s) = \frac{1}{S(1+S)(1+2S)}$.

7. Explain the procedure for the design of lag compensator in Frequency Domain.

8. a) Obtain the Solution of homogeneous state equation.

   b) Obtain the state space representation for the System $\frac{Y(S)}{U(S)} = \frac{S+6}{S^2+5S+6}$.

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Hall Ticket Number :										

R-11 / R-13

Code: 1GC41

II B.Tech. II Semester Supplementary Examinations Nov/Dec 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. a) Show that $\Gamma\left(\frac{1}{2}\right)=\sqrt{®}$ 7M

   b) Evaluate $\int_0^{®/2}\sqrt{\tan^{-}}\,d^{-}$ 7M

2. Given $f(z)=u+iv$ is an analytic function of z and if $u=\frac{1}{2}\log(x^2+y^2)$ find $f(z)$ in terms of z. 14M

3. a) Given $\mathrm{Sin}(x+iy)=u+iv$ then show that $u^2\,\mathrm{Cos}\,ec^2y=v^2\,\mathrm{S}ee^2x=1$ 7M

   b) Prove that $4\left(a^2-b^2\right)=\frac{x}{a}+\frac{y}{b}$ if $(x+iy)^{1/3}=a+ib$ 7M

4. a) Using Cauchy's integral formula evaluate $\int_c\frac{\sin^2 z}{\left(z-\frac{®}{6}\right)^3}dz$ where C is unit circle. 7M

   b) Find $\int_c z^2\,dz$ along the straight line from z = 0 to z = i 7M

5. Obtain Taylor Series to represent the function $f(z)=\frac{e^z}{z(z+1)}$,in the region $|z|=2$ 14M

6. Evaluate the real integral $I=\int_{-\infty}^{\infty}\frac{1}{1+x^2}dx$ by the method of Residue Theorem 14M

7. Show that one root of the equation $z^4+z+1=0$ lies in the first quadrant of the complex plane. 14M

8. Define bilinear transformation. Find the bilinear transformation that maps the points $z=2,\ i,-2$ into the points $w=1,\ i,-1$ respectively. 14M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G343

II B.Tech. II Semester Supplementary Examinations Nov/Dec 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)	A symmetrical square wave whose peak to peak amplitude is 1V and whose average value is zero is applied to an RC integrating circuit. The time constant is equal to time period of the square wave form. Find the peak to peak value of the output wave form.	8M
	b)	Illustrate the response of RC high pass circuit for an exponential input.	6M
2.	a)	State and prove Clamping circuit theorem.	7M
	b)	Relate the operation of series clipper and shunt clipper with corresponding RC circuits and give reasons for it.	7M
3.	a)	Define i) Transition time ii) settling time iii) diode reverse recovery time.	6M
	b)	Draw the inverter circuit with BJT and explain.	8M
4.	a)	Design an astable multivibrator, to generate a square wave of 2KHz frequency with a duty cycle of 35%?	9M
	b)	Draw the circuit of emitter coupled binary and its wave forms with all details	5M
5.	a)	Explain the basic principles of Miller and Bootstrap time base generators	4M
	b)	Why the time base generators are called sweep circuits? Give most important applications of time –base generators.	3M
	c)	Draw the circuit of UJT-time base generator and explain its operation with wave forms.	7M
6.	a)	How pedestal shall be removed by sampling gate? Discuss.	7M
	b)	Explain the function of a sampling gate used in Sampling Scopes also explain how sampling gate is used in chopping amplifiers.	7M
7.	a)	Define pulse synchronization. Explain the frequency division in the sweep circuit	6M
	b)	Define synchronization and mention different types of synchronization. What is synchronization on a one-to-one basis?	8M
8.	a)	List out the merits and demerits of CML logic.	5M
	b)	Explain the 2-input NAND gate of DTL family?	5M
	c)	Draw and Explain the basic CMOS inverter circuit?	4M

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