Hall Ticket Number :										

R-11 / R-13

Code: 1G342

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Electromagnetic Waves and Transmission Lines

(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) Describe the relationship between electric field E and electric potential V with related equations
   b) What is electric flux density
2. a) Discover convection and conduction currents
   b) Describe the Conductors in Electric fields in material space
3. a) Analyze the Magnetic Flux density
   b) Compare Magnetic Scalar and vector potential
4. Explain the boundary condition at dielectric to dielectric interface
5. Summarize waves in general with neat wave diagrams
6. In a nonmagnetic medium **E** = $4\sin(2\pi \times 10^7 t - 0.8x)a_z$ V/m. Find
   (i) ε_r, η
   (ii) the time average power carried by the wave
7. a) Define Propagation Constant
   b) The parameters of the line are
   R =65ohms/km
   L = 1.6mH/km
   C = 0.1 μF/km
   G = 2.25μΩ/km
   Calculate the characteristic impedance.
8. a) Discuss on Short Circuit (SC) and Open circuit (OC) Lines
   b) What is Standing wave and how it produces in transmission lines

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Hall Ticket Number :										

R-11 / R-13

Code: 1G246

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Electrical Technology

(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) Find the expression for transient response of a series R-L-C circuit excited by a D.C voltage when the switch in closed at t=0.

   b) Find the transient current i(t) in the R-C series circuit shown in fig.2 .

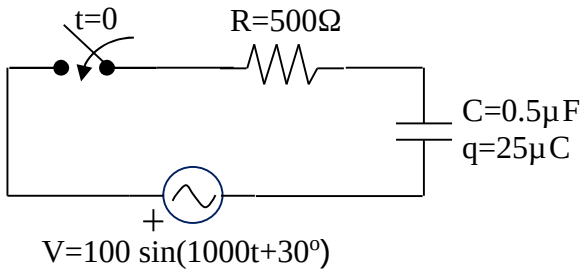

Fig.2

2. a) Derive the relation between 'Y' and hybrid parameters

   b) A two port network has the following parameters: Z_{11} = 17 kΩ, Z_{12} = 12 kΩ, Z_{21} = 12 kΩ and Z_{22} = 15 kΩ. Calculate short circuit parameters.

3. a) Classify the different types of filters.

   b) A proto type high pass filter has a cutoff frequency of 8 kHz and nominal impedance of 600Ω. Calculate the values of inductance and capacitance used in the filter.

4. Explain T-type attenuator and Lattice attenuator by deriving necessary equations.

5. a) In brief explain various losses in a DC generator.

   b) Draw and explain the load characteristics of i) DC shunt generator ii) DC series generator.

6. Classify types of DC motors and write the voltage current relation of each.

7. Discuss the importance of open-circuit and short-circuit tests on a transformer, and also explain the procedure for open circuit and short circuit tests with neat circuit diagrams.

8. Write short notes on:

   (a) Stepper motor.

   (b) Capacitor motor.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G244

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

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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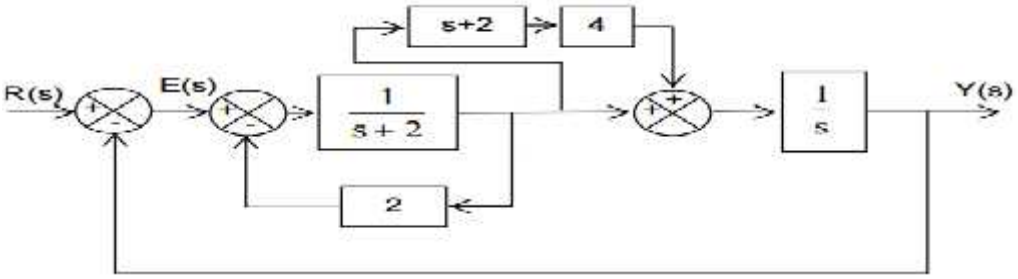
1. a) Define open loop and closed loop control system.
   b) Explain open loop and closed loop Temperature control system with neat sketches.
2. a) Explain Block diagram algebra with clear figures
   b) Use the Block diagram reduction technique to find the transfer function Y(S)/R(S)



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.

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

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

5. Explain the procedure for magnitude and phase plot of Bode plot

6. a) Define Polar plot.
   b) Explain the procedure to determine the Gain margin and Phase margin from Polar plot.

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

8. Estimate the complete state controllability and observability of the system using Jordan Canonical form $A = \begin{bmatrix} -1 & 1 & 0 \\ 0 & -4 & 2 \\ 0 & 0 & -10 \end{bmatrix}; B = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}; C = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}.$

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Hall Ticket Number :										

R-11 / R-13

Code: 1GC41

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

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) Define Beta function. Prove that $(m,n) = (n,m)$

   b) Find the value of $\int_0^1 x^3\sqrt{1-x}\,dx$ using and Γ functions

2. State and Prove Cauchys-Reimann equations in Cartesian form.

3. Find the general and principal values of

   a. i^i b. $\log\left(1+i\sqrt{3}\right)$

4. a) Evaluate $\int_c (x+y)\,dx + x^2 y\,dy$ from (0,0) to (3,9) along the straight line $x^2 = y$.

   b) Find $\int_c \frac{1}{(z-1)(z-3)}\,dz$ with C: $|z| = 2$ using Cauchy's integral formula.

5. Expand $f(z) = \frac{z-1}{z+1}$, in Taylor series about the point $(i): |z| = 0 \quad (ii): |z| = 1$

6. Using Residue Theorem, Evaluate $\int_0^{2\pi} \frac{1}{5+4\cos\theta}\,d\theta$

7. State and prove Argument principle.

8. Find the fixed points of the transformation

   (a) $w = \frac{6z-9}{z}$ (b) $w = \frac{z-1}{z+1}$

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Hall Ticket Number :										

R-11 / R-13

Code: 1G341

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Signals & 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 in Fourier series
   b) Find the cosine Fourier series of a half wave rectified sine function

3. a) Find the Fourier Transform of Rectangular pulse. Sketch the signal and Fourier transform
   b) Evaluate the Fourier transform of following signals
      i) $x(t) = e^{2t}u(-t)$
      ii) sinc function

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) Determine the energy spectral density (ESD) of a gate function of width τ and amplitude A.
   b) Elucidate the graphical method of Convolution using one example.

6. State and Prove Sampling Theorem with appropriate equations and sketches

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

8. a) Describe about the Periodicity of discrete time using complex exponential signal
   b) Enlist the properties of Z-transforms and explain any three.

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Hall Ticket Number :										

R-11/R-13

Code : 1G245

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Switching Theory and Logic Design

(Electronics & Communication Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)

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1. a) Do the following conversions
   i) $(100)_8=(\quad)_{10}$
   ii) $(225.25)_{10}=(\quad)_{16}$
   iii) $(ECE)_{16=}(\quad)_2$ 7M

   b) Perform following operations on binary numbers
   i)1011010.0001+1010000.1
   ii)1010-0101
   iii)1111*1000 7M

2. a) State and prove the De-Morgan's theorems 8M

   b) Draw the logic symbols of logic gates explain truth tables of them. 6M

3. a) Implementation of the following function using NAND-NAND logic
   $F(a,b,c,d)= \sum (1,3,5,7,9,11,13)$ 8M

   b) Define Prime implicants, Essential prime implicants and Selective prime implicants 6M

4. a) Realize full subtractor using half subtractors. 6M

   b) Design 3X8 decoder using NAND gates. 8M

5. a) Construct BCD to excess-3 code converter using PAL 7M

   b) Implement full adder using PLA 7M

6. a) Draw the logic diagram of JK-FF and explain operation. 8M

   b) Convert T-FF to D-FF 6M

7. a) Discuss about the capabilities and limitations of FSM 7M

   b) Reduce the number of states in the following state table and tabulate the reduced state table

PS	NS,Z	
	X=0	X=1
a	a,0	b,0
b	d,1	f,0
c	b,1	a,1
d	d,1	f,0
e	e,1	e,1
f	a,0	b,0

7M

8. Design a control circuit using mux and D- FFs with one input When X=0, the state of the circuit remains the same. When X=1,the circuit goes through the state transition from 00 to 01 to 10 to 11 and repeats 14M

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