Hall Ticket Number :										

R-17

Code: 7G344

II B.Tech. II Semester Supplementary Examinations December 2022

Field Theory and Transmission Lines

(Electronics and Communication 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	CO	BL
		UNIT–I			
1.	a)	Explain in detail about Gauss's Law	7M	CO1	L2
	b)	Summarize the advantages and applications of Gauss law?	7M	CO1	L2
		OR			
2.	a)	Define Electric field intensity? Derive Electric field intensity for surface charge.	7M	CO1	L1
	b)	Point Charges Q1=4μc, Q2=-5μc and Q3=2 μc are located at (0,0,1).(-6,8,0) and (0,4,-3) respectively find D at the origin.	7M	CO1	L4
		UNIT–II			
3.	a)	Define Linear, Isotropic and Homogeneous Dielectrics	7M	CO2	L1
	b)	Identify the convection and conduction currents	7M	CO2	L1
		OR			
4.	a)	Describe the Conductors in Electric fields in material space	7M	CO2	L2
	b)	Write a note on polarization in dielectrics	7M	CO2	L2
		UNIT–III			
5.		State and explain Biot savart law with neat diagram and expressions	14M	CO3	L2
		OR			
6.	a)	Define Faradays laws and explain with suitable equation	7M	CO3	L2
	b)	Write Maxwells equations in final forms	7M	CO3	L1
		UNIT–IV			
7.	a)	Define an em wave and briefly explain waves in general	7M	CO4	L1
	b)	Compare the propagation of waves in Lossy and lossless dielectrics	7M	CO4	L3
		OR			
8.	a)	Analyze the propagation of Plane waves in Good conductors	7M	CO4	L4
	b)	Illustrate the nature of propagation of plane wave in free space	7M	CO4	L3
		UNIT–V			
9.	a)	What is a Transmission Line? Label different types of transmission lines?	7M	CO5	L1
	b)	Explain transmission line primary parameters	7M	CO5	L2
		OR			
10.	a)	With the help of a neat diagram explain the smith chart	7M	CO5	L2
	b)	List the properties of smith chart	7M	CO5	L2

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Hall Ticket Number :										

R-17

Code: 7GA41

II B.Tech. II Semester Supplementary Examinations December 2022

Managerial Economics and Financial Accounting

(Electronics and Communication 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	CO	Blooms Level
	UNIT–I			
1.	Deliberate the importance and scope of Managerial Economics?	14M	CO1	L2
	OR			
2.	Determine the concept of cross elasticity of demand. Discuss the method to measure such elasticity?	14M	CO1	L3
	UNIT–II			
3.	Define Cost. Explain the different cost concepts used in the process of Cost Analysis	14M	CO2	L2
	OR			
4.	Discuss the following			
	a) Economies of scale	7M		L2
	b) Least Cost Combination of Inputs	7M	CO2	L2
	UNIT–III			
5.	Describe the features, advantages and disadvantages of Sole trader form of Organization?	14M	CO3	L2
	OR			
6.	Briefly discuss the price-output determination in monopolistic competition.	14M	CO3	L2
	UNIT–IV			
7.	Discuss the following			
	a) Working Capital & Its Affecting Factors	7M	CO4	L2
	b) NPV Method advantages and disadvantages	7M	CO4	L2
	OR			
8.	Calculate Net Present Value (NPV) and Profitability Index (PI) for both the projects.			

Years	Project-A Cash in flows	Project-B Cash in flows	PV@10%
1	2,50,000	3,50,000	0,909
2	1,80,000	1,50,000	0,826
3	1,20,000	1,80,000	0,751
4	1,10,000	80,000	0.683
5	75,000	60,000	0.621
5 (scrap)	50,000	40,000	0.621

Initial investment for the project-A; Rs.4,80,000 and project-B; Rs.6,00,000 and cost of capital assumed to be 10%.

14M CO4 L3

UNIT–V

9. Briefly discuss various types of Accounts (Golden Rules of Accounting) with examples? 14M CO5 L2

OR

10. Define Capital Budgeting. Explain the Nature, Scope and Features of Capital Budgeting? 14M CO5 L2

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Hall Ticket Number :										

R-17

Code: 7G342

II B.Tech. II Semester Supplementary Examinations December 2022

Pulse and Digital Circuits

(Electronics and Communication 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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UNIT–I

1. a) Draw the output waveform of a High Pass RC circuit excited by square wave with different time constants 10M

   b) Show that how Low Pass RC circuit acts as an Integrator 4M

OR

2. a) A 1KHZ square wave output from an amplifier has Rise time t_r=350ns and tilt=5%. Determine upper and lower 3-dB frequency 7M

   b) Show that Percentage tilt P= T/2RC X 100 7M

UNIT–II

3. a) Explain the clamping circuit considering the source resistance and the diode forward resistance. 7M

   b) With neat sketches Explain the transistor switching times. 7M

OR

4. Explain series and shunt clippers with and without reference voltage and also explain clipping at two independent levels with help of transfer characteristics. 14M

UNIT–III

5. a) How Astable Multivibrator acts as free running oscillator 7M

   b) What are the applications of Multivibrators 7M

OR

6. a) Explain the importance of Symmetrical triggering in Bistable multivibrator with neat circuit diagram 7M

   b) Derive the expression for frequency of oscillations of an Astable Multivibrator 7M

UNIT–IV

7. a) List out the various methods to generate a time base waveform 7M

   b) The specifications of UJT are given as η =0.6, V_V = 2 V, R_{BB} = 5 kΩ, I_V=1.5 mA, I_P = 8 μA and V_{BB} = 18 V. Calculate the component values of the UJT sweep circuit to generate an output sweep frequency of 10kHz with sweep amplitude of 12 V. 7M

OR

8. a) Explain the basic principles of Miller and Bootstrap time base generators. 7M

   b) Discuss about Transistor Current Time Base Generator 7M

UNIT–V

9. a) Explain the working of Bidirectional diode sampling gate with neat circuit diagram 10M

   b) What is pedestal? How its effect the output of a sampling gate? 4M

OR

10. a) Draw the four diode sampling gate and derive the expression for gain. 10M

    b) Illustrate with neat circuit diagram, the operation of unidirectional sampling gate for multiple inputs. 4M

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Hall Ticket Number :										

R-17

Code: 7G341

II B.Tech. II Semester Supplementary Examinations December 2022

Random Variables and Random Processes

(Electronics and Communication 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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UNIT–I

1. a) Coin A has a probability of head =1/4 and coin B is a fair coin. Each coin is flipped four times. If X is the number of heads resulting from coin and Y denotes the same from coin B, what is the probability for X=Y? 7M

   b) Explain about Conditional Distribution & Conditional Density Functions with necessary equations 7M

OR

2. a) Define Random Variable. Write about the continuous and mixed random variables. 6M

   b) Discuss the Independent and mutually exclusive events with an example each. 8M

UNIT–II

3. a) Determine the moment generating function about origin of the Poisson distribution. 8M

   b) Obtain the variance of Raleigh random variable 6M

OR

4. a) Find the Moment generating function of exponential distribution? 7M

   b) Calculate the characteristic function and first moment for $fX(x) = (1/b)\exp(-(x-a)/b)$ for $x \geq a$ 7M

UNIT–III

5. a) Two statistically independent random variables X and Y have mean values E[X] = 2 and E[Y] = 4. They have second moments $E[X^2] = 8$ and $E[Y^2] = 25$. Find Variance of W = 3X-Y 8M

   b) Write short notes on jointly Gaussian random variables. 6M

OR

6. a) Verify the properties of joint characteristic function. 7M

   b) Explain covariance of two random variables. 7M

UNIT–IV

7. a) If x (t) is a stationary random process having mean = 3 and auto correlation function: $RXX(\tau) = 9 + 2^{|-\tau|}$. Find the mean and variance of the random variable. 7M

   b) With suitable example and mathematical equations, illustrate the difference between a wide-sense stationary and strict-sense stationary stochastic process 7M

OR

8. a) State and prove properties of cross correlation function 9M

   b) Classify random processes and explain. 5M

UNIT–V

9. a) Derive the relation between input PSD and output PSD of an LTI system 7M

   b) Find power spectrum of WSS noise process N(t) with autocorrelation function defined as below $R_{NN}(\tau) = Pe^{-3|\tau|}$ 7M

OR

10. a) Derive the expression for power density spectrum of a random process 7M

    b) Discuss properties of cross power density spectrum 7M

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Hall Ticket Number :										

R-17

Code: 7G343

II B.Tech. II Semester Supplementary Examinations December 2022

Analog Communication

(Electronics and Communication 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	CO	BL
		UNIT–I			
1.	a)	What is Costas Loop? How it can be used in the detection of DSBSC signals.	7M	1	1
	b)	A 400W carrier is modulated to a depth of 75%. Find the total power of the amplitude modulation scheme by assuming the modulating signal is sinusoidal.	7M	1	4
		OR			
2.	a)	Derive an expression for single-tone amplitude modulated wave. Also draw its spectrum	7M	1	2
	b)	Explain about the SSB-SC generation method.	7M	1	2
		UNIT–II			
3.	a)	Explain about the block diagram of Indirect method of FM with its working principle.	10M	2	2
	b)	Compare between FM and AM.	4M	2	5
		OR			
4.	a)	Explain with suitable diagram, how the Narrow band FM signal may be generated.	7M	2	2
	b)	Describe the working principle of detection of FM	7M	2	2
		UNIT–III			
5.	a)	Compare AM and FM by considering noise.	7M	3	5
	b)	Discuss the role of pre-emphasis and de-emphasis in commercial FM.	7M	3	2
		OR			
6.	a)	Describe the noise performance of FM system.	7M	3	2
	b)	Determine the expression for output SNR for DSB-SC system	7M	3	3
		UNIT–IV			
7.	a)	Classify the radio Receivers based on type of modulation and service involved.	7M	4	4
	b)	Explain the effect of Image frequency on voice communication.	7M	4	2
		OR			
8.	a)	Describe the steps to improve the image frequency rejection and how it is rejected?	7M	4	2
	b)	Discuss the factors influencing the choice of Intermediate frequency for a radio receiver?	7M	4	2
		UNIT–V			
9.	a)	Describe the scheme of generation of PAM signals with neat sketches.	6M	5	2
	b)	Summarize the working principle of Frequency division multiplexing?	8M	5	2
		OR			
10.	a)	Explain the method of generation and detection of PAM signals with neat schematics.	8M	5	2
	b)	Describe with suitable circuit, the scheme of detection of PAM signals.	6M	5	2

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Hall Ticket Number :										

R-17

Code: 7GC43

II B.Tech. II Semester Supplementary Examinations December 2022

Complex Variables and Special Functions

(Common to EEE & ECE)

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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UNIT–I

1. Prove that $\int_0^{\frac{\pi}{2}} \sin^{2}\theta \cos^{4}\theta \, d\theta = \frac{\pi}{32}$ 14M

OR

2. Find all principals values of $\left(\frac{\sqrt{3}}{2} + \frac{i}{\sqrt{2}}\right)^{\left(1+i\sqrt{3}\right)}$ 14M

UNIT–II

3. a) Find all values of K, such that $f(z) = e^{x}\left[\cos ky + i \sin ky\right]$ is analytic. 7M

   b) Show that $f(z) = z^{2}$ is analytic for all z. 7M

OR

4. Prove that z^{n} (n is a positive integer) is analytic and hence find its derivative. 14M

UNIT–III

5. Evaluate $\int_c \frac{z^{3} - \sin 3z}{\left(z - \frac{\pi}{2}\right)^{3}} dz$ with $c : |z| = 2$ using Cauchy's integral formula. 14M

OR

6. Expand $Log\, z$ by Taylor's series about z=1. 14M

UNIT–IV

7. Evaluate $\int_c \frac{2e^{z}}{z(z-3)} dz$ where c is $|z| = 2$ by residue theorem 14M

OR

8. Show that $\int_0^{2\pi} \frac{1}{2 + \cos\theta} d\theta = \frac{2\pi}{\sqrt{3}}$ 14M

UNIT–V

9. Show that the image of the hyperbola $x^{2} - y^{2} = 1$ under the Transformation $w = \frac{1}{z}$ is the Lemniscate $r^{2} = \cos 2\theta$ 14M

OR

10. Show that the function $w = \frac{4}{z}$ transforms the straight line x=c in the z-plane into a circle in the w-plane. 14M

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