18MA004

Hall Ticket Number:

II/IV B.Tech (Regular/Supplementary – Repeat Exam) DEGREE EXAMINATION

January, 2021 **ECE & EIE**

Fourth Semester **COMPLEX VARIABLES & SPECIAL FUNCTIONS**

Time: Three Hours **Maximum:** 50 Marks

Answer ALL Questions from PART-A. (1X10 = 10 Marks)

*Answer **ANY FOUR** questions from PART-B.* (4X10=40 Marks)

PART-A

1.	a)	Find the argument of $1+i$.	**CO1**	**1M**
	b)	Check whether the function u = x^2 - y^2 is harmonic or not?	**CO1**	**1M**
	c)	Find the value of $\oint_c \frac{dz}{z-a}$, where c is $\lvert z-a\rvert = r$	**CO1**	**1M**
	d)	State Cauchy Residue Theorem.	**CO2**	**1M**
	e)	Find the nature of singularity of the function $f(z) = \frac{z - Sin Z}{z^2}$	**CO2**	**1M**
	f)	What is the Fourier complex Integral formula?	**CO3**	**1M**
	g)	State Linear property.	**CO3**	**1M**
	h)	Write the value of $F\left(\frac{\partial^2 u}{\partial x^2}\right)$	**CO3**	**1M**
	i)	State Bessel's Differential equation.	**CO4**	**1M**
	j)	Determine $J_1(0)$	**CO4**	**1M**

PART-B

2.	a)	Find all the roots of $(1+i)^{\frac{1}{4}}$	**CO1**	**5M**
	b)	Determine the analytic function whose real part is $\cos x \cosh y$ by using Milne Thomson's Method.	**CO1**	**5M**
3.		If F(ζ)= $\oint_c \frac{4z^2+z+5}{(z-\zeta)} dz$ where c is the ellipse $\left(\frac{x}{2}\right)^2 + \left(\frac{y}{3}\right)^2 = 1$, Find the values of (i). F(3.5) , (ii). F(i), (iii). F^1 (-1) and (iv). F^{11} (-i)	**CO1**	**10M**
4.	a)	Expand f (z) = $\frac{z}{(z-1)(z-3)}$ for $\lvert z-1\rvert < 2$ in Laurent series.	**CO2**	**5M**
	b)	Expand $\text{Sin}\, z$ in a Taylor's series about $z=0$ and determine the region of Convergence.	**CO2**	**5M**

P.T.O.

5. a) Evaluate $\oint_c \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)^2(z-2)} dz$,where c is the circle $|z| = 3$ **CO2** **5M**

b) Find $\int_{-\infty}^{\infty} \frac{x^2 dx}{(x^2+1)(x^2+4)}$ **CO2** **5M**

6. a) Find the Fourier sine transform of $\frac{e^{-ax}}{x}$ **CO3** **5M**

b) Express f(x)=$\begin{cases} 1 & for\ 0 \le x \le \pi \\ 0 & for\ x > \pi \end{cases}$ as a Fourier sine integral and hence evaluate $\int_0^{\infty} \frac{1-\cos \pi\lambda}{\lambda} \sin x\lambda \ d\lambda$ **CO3** **5M**

7. Find the Fourier transform of f(x)=$\begin{cases} 1-x^2, & |x| \le 1 \\ 0 & ,|x| > 1 \end{cases}$ Hence evaluate $\int_0^{\infty} \frac{x\cos x - \sin x}{x^3} \cos\frac{x}{2} dx$ **10M**
CO3

8. Solve in series the equation $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$ **CO4** **10M**

9. a) Prove that $J_n(x) = \frac{x}{2n}\left(J_{n-1}(x) + J_{n+1}(x)\right)$ **CO4** **5M**

b) Determine $J_{\frac{1}{2}}(x)$ **CO4** **5M**

Hall Ticket Number: **18EL002**

II/IV B.Tech (Regular / Supplementary – Repeat Exam) DEGREE EXAMINATION

January, 2021 **CSE/MECH/ CIVIL& EIE**

Second Semester **Technical English**

Time: Three Hours **Maximum:** 50 Marks

Answer ALL Questions from PART-A. (1X10 = 10 Marks)

*Answer **ANY FOUR** questions from PART-B.* (4X10=40 Marks)

Part - A

1. Answer all the questions as directed. (1X10 = 10 Marks)

a. Fill in the Blanks with the suitable verb forms: **M CO BL**
3 2,4 3

i. The exams of the students_____ postponed to May 15th.
ii. What do you think? , I_____ (buy) an Audi car.
iii. The Prime Minister_____ (address)the nation last night last night.

b. Write the meaning of the following phrasal verbs and use them in your own sentences
M CO BL
2 1,4 3

i) Turn down
ii) Run away

c. Write bias-free substitutes to the following biased words.
M CO BL
2 1,4 3

i) Camera Man
ii) Man is mortal

d. Select the correct statement: **M CO BL**

i) From address should be written first in a letter **1 3,5 4**
ii) To address should be written first.

e. Write the meanings of the following Corporate Vocabulary:
M CO BL
2 1,4 3

i) Equity
ii) Merger

Part - B **M CO BL**
10 1,4,5 6

2.a. Fill in the blanks with the suitable transition words given 3M

When	At the beginning	Eventually	However	First	Then	At the end	And	for instance

"El Norte" is an excellent and disturbing film about two immigrants to the United States. 1 _____ of the film, we meet a family in Guatemala – mother, father, son and daughter. 2____the father is killed and the mother is taken to the prison, the son and the daughter decide to go to "El Norte" – the United States by way of Mexico. 3_____, they have trouble finding someone to take them across the Mexican border, but then, they find a way across and end up in Los Angeles. 4_____, life in the U.S. is not as easy as they thought it would be. First, they have to find housing, then, they need to learn English and get jobs.5_____, they succeed in accomplishing these three goals and life looks pretty good for them. Unfortunately, 6_____of the film, tragedy strikes and we are left wondering if "El Norte" really is the land of opportunity after all.

b. Write a letter to the Director of A.P Pollution control board to take measures to curb honking of horns at signals 7M

P.T.O.

3.a Choose the idiom or phrase that best fits in the given sentences. 3M

1. Why do you raise these controversial issues in the meeting?Please_____
   a. tie the knot
   b. let the sleeping dogs lie
   c. carry a torch
   d. cross your fingers
2. I am not surprised the Mr.Harish is nominated as the next CEO by his father, After all_____
   a. great minds think alike
   b. all in the boat
   c. curiosity killed the cat
   d. blood is thicker than water
3. The Covid-19 pandemic_____ through out the world after March 2020
   a. break out
   b. break in
   c. break down
   d. break up

b. Write an e-mail to file an FIR to the nearest police station of your area stating that you have lost your wallet with credit card, debit card and cash. **7M**

M	**CO**	**BL**
10	**1,3,5**	**6**

4. a. In the following passage there are blanks, which have been numbered. Find out the appropriate word in each case from the words given below the passage. **3M**

There is already an extensive empirical literature – often using growth accounts – that **(1)…….** these and other aspects of India's economic growth. Many of the studies **(2)…….** one or more of the following topics. First, several analysts **(3)……** focused on characterizing India's economic performance at the most aggregate level. While there is an agreement that growth did indeed improve during the past quarter-century, researchers have reached varying conclusions on some issues such as the timing and precise magnitude of this acceleration, and the relative importance of changes in domestic policy. There are on-going discussions over the extent to which the current growth can be maintained and various means by **(4)…….** it might be increased. Second, analysts have examined the behaviour of particular output sectors. Several authors have studied productivity in manufacturing – reaching a wide range of conflicting conclusions. However, as explained in detail by Goldar and Mitra (2002), differences in the findings can be **(5)…….** to a variety of measurement issues, such as the use of single versus double deflation to construct estimates of real growth in manufacturing value-added. Goldar (2004) provides a careful recent update showing that TFP growth in manufacturing **(6)…….** to have slowed in the post-reform period – raising additional puzzles discussed below.

1)	(a) examine	(b) examines	(c)forecast	(d) forecasts	(e) augur
2)	(a) address	(b) denote	(c)addresses	(d) facilitate	(e) evolve
3)	(a) has	(b) will	(c)should have	(d) have	(e) had
4)	(a) which	(b) that	(c)if	(d)whether	(e) whose
5)	(a) devote	(b) attributes	(c)attributed	(d) decided	(e) developed
6)	(a) appeared	(b) appears	(c)looked	(d) seemed	(e) forecast

b. Consider yourself as the Regional Medical Officer of your division and write a report on the prevalence and measures take to curb Corona virus disease under your jurisdiction. **7M**

5. a. In the following sets of analogies one word is missing. Select the best option from the given words that exhibit the same analogy as established among the three words. **3M**

i. Segregate : Unify :: Damage : _____
   a) approach b) push c) repair d) pull

ii. Follow: Chase :: Nudge : _____
   a) Thurst b) Pursue c) Catch d) Precede

iii. Dictionary: Definition :: _____ : Map
   a) direction b) south c) atlas d) longitude

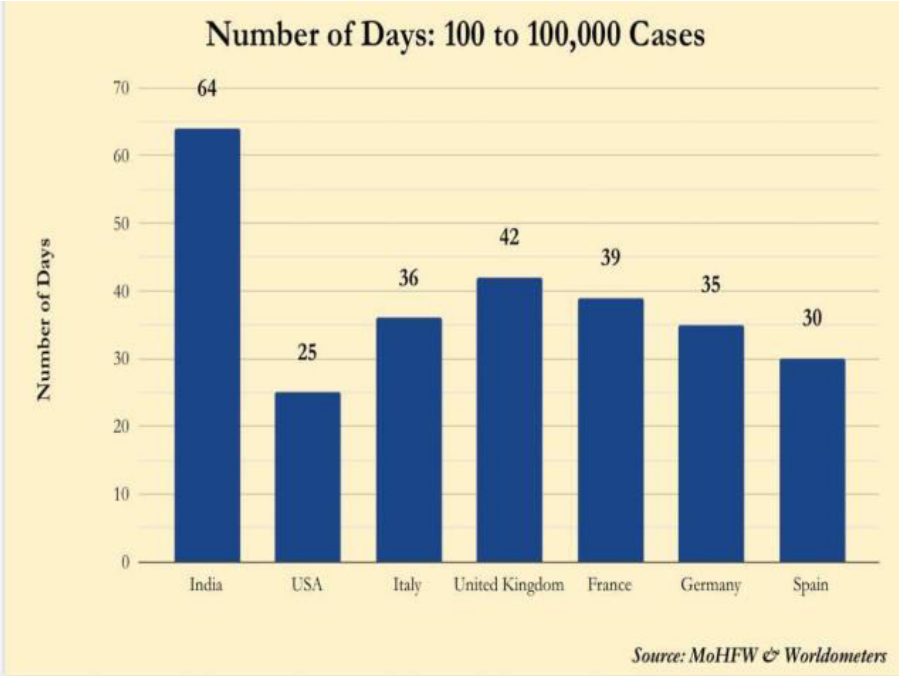
b. Your friend had borrowed money from you long back and he/she is not paying you back in spite of repeated reminders from you. Write a dialogue between you and your friend. **7M**

M	CO	BL
10	1,3,4,5	4,6

6.a. Write the full form of the following acronyms or abbreviations: 3M

i. WHO ii. CEO iii. AICTE

b. Infer the following diagram Corona positive cases and write your analysis: **7M**



7.a. Describe the process of opening a savings bank account **3M**

b. Write a Memo to your subordinate seeking explanation on the allegations against him about taking bribes and issue a circular for the same in your office. **7M**

M	CO	BL
10	3,4,5	6

8. a. Read the passage and answer the questions that follow **3M**

If by "suburb" is meant an urban margin that grows more rapidly than its already developed interior, the process of suburbanization began during the emergence of the industrial city in the second quarter of the nineteenth century. Before that period the city was a small highly compact cluster in which people moved about on foot and goods were conveyed by horse and cart. But the early factories built in the 1830's and 1840's were located along waterways and near railheads at the edges of cities, and housing was needed for the thousands of people drawn by the prospect of employment. In time, the factories were surrounded by proliferating mill towns of apartments and row houses that abutted the older, main cities. As a defense against this encroachment and to enlarge their tax bases, the cities appropriated their industrial neighbors. In 1854, for example, the city of Philadelphia annexed most of Philadelphia County. Similar municipal maneuvers took place in Chicago and in New York Indeed, most great cities of the United States achieved such status only by incorporating the communities along their borders.

With the acceleration of industrial growth came acute urban crowding and accompanying social stress conditions that began to approach disastrous proportions when, in 1888, the first commercially successful electric traction line was developed. Within a few years the horse - drawn trolleys were retired and electric streetcar networks crisscrossed and connected every major urban area, fostering a wave of suburbanization that transformed the compact industrial city into a dispersed metropolis. This first phase of mass - scale suburbanization was reinforced by the simultaneous emergence of the urban Middle class whose desires for homeownership In neighborhoods far from the aging inner city were satisfied by the developers of single-family housing tracts.

1. Which of the following is the best title for the passage?
(A) The growth of Philadelphia (B) The Origin of the Suburb
(C) The Development of City Transportation (D) the Rise of the Urban Middle Class

2. The author mentions that areas bordering the cities have grown during periods of
(A) Industrialization (B) inflation
(C) Revitalization (D) unionization

3. In line 10 the word "encroachment" refers to which of the following?
(A) The smell of the factories (B) The growth of mill towns
(C) The development of waterways (D) The loss of jobs

4. Which of the following was NOT mentioned in the passage as a factor in nineteenth-century suburbanization?
(A) Cheaper housing (B) Urban crowding
(C) The advent of an urban middle class (D) The invention of the electric streetcar

5. It can be inferred from the passage that after 1890 most people traveled around cities by
(A) Automobile (B) cart
(C) horse-drawn trolley D) electric streetcar

6. Where in the passage does the author describe the cities as they were prior to suburbanization?
(A) Lines 3-5 (B) Lines 5-9
(C) Lines 12- 13 (D) Lines 15-18

(b) Considering yourself as the Computer Science Engineer, Draft a Resume to apply for a job as Software Engineer in a reputed company **7M**

9.a. Rewrite the following sentences using the cue and inversion. **3M**

1. I haven't ever smoked a cigarette . - never
2. I understood the problem-Only then
3. They have never been on time-Scarcely

b. As a fresh graduate in Engineering, Draft a Resume to upload into Naukri.com. **7M**

14MA401

Hall Ticket Number:

II/IV B.Tech (Regular / Supplementary Repeat Exam) DEGREE EXAMINATION

January, 2021 — **Common to all branches**

Fourth Semester — **Engineering Mathematics-IV**

Time: Three Hours — **Maximum:** 60 Marks

Answer All Questions from Part - A (1X12 = 12 Marks)

Answer ANY FOUR questions from Part - B (4X12=48 Marks)

Part - A

1. Answer all questions (1X12=12 Marks)

a) Find the imaginary part of log (-i)

b) State Cauchy-Rieman equations in Cartesian form

c) Evaluate $\int_0^{1+i} z^2 dz$

d) Write the formula Cauchy's Internal formula

e) Evaluate $\int_c \frac{dz}{z-2}$ where 'c' is the circle $|z-2|=1$

f) Find the poles of $\frac{1}{z^2-1}$

g) Find the value of finite population correction factor of n=100 and N=1000

h) What is the mean and variance of Binomial distribution

i) Define maximum error of estimate for small samples

j) Define Type I error and Type II error

k) Define F- distribution

l) an assert with 95% that the maximum error is 0.05 and p= 0.2, find the size of the sample

Part - B

2. a) If w=logz find $\frac{dw}{dz}$ and determine where w is non analytic 6M

b) Show that $u = e^{-x}(xsiny - ycosy)$ is harmonic 6M

3. a) Evaluate $\int_0^{1+i}(x^2 - iy)dz$ along the path (i)y=x (ii) $y=x^2$ 6M

b) Evaluate $\int \frac{sin^2 z}{(z-\frac{\pi}{6})^3} dz$, if c is the circle $|z|=1$ 6M

4. a) Obtain the Taylor series to represent the function $\frac{z^2-1}{(z+2)(z+3)}$ in the region $|z|<2$ 6M

b) Obtain the Laurent series of the function $\frac{7z-2}{(z+1)z(z-2)}$ about $z_0=-1$ 6M

5. a) Find the poles and residues at each pole $\frac{ze^z}{(z-1)^3}$ 6M

b) Use the method of contour integration to evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+a^2)^3} dx$ 6M

P.T.O.

6. a) If the probability of a random variable is given by $f(x) = \begin{Bmatrix} kx^2 & 0 < x < 1 \\ 0 & elsewhere \end{Bmatrix}$ 6M

Find the value k and probability that the random variable takes on a value

(a) Between $\frac{1}{4} and \frac{3}{4}$ (b) greater than $\frac{2}{3}$

b) Find the probability that a random variable having the standard normal distribution will take as value 6M

(a) Between 0.87 and 1.28 (b)between -0.34 and 0.62

(c) greater than 0.85 (d) greater than -0.65

7. a) If a 1-gallon can a paint covers on the average 513.3 square feet with a standard deviation of 31.5 square feet, what is probability that the sample mean covered by a sample of 40 of these 1-gallon cans will be anywhere from 510.0 to 520.0 square feet 6M

b) The chi-square distribution with 4 degrees of freedom is given $f(x) = \begin{Bmatrix} \frac{1}{4} xe^{-\frac{x}{2}} & x > 0 \\ 0 & x \leq 0 \end{Bmatrix}$ find the probability that a variance of a random sample of size 5 from a normal population with $\sigma = 12 \; will \; exceed \; 180$ 6M

8. a) A random sample of size n=100 is taken from a population with $\sigma = 5.1$. Given that the sample mean is $\bar{x} = 21.6$ construct a 95% confidence interval for the population mean u. 6M

b) A research worker wants to determine the average time it takes a mechanic to rotate the tires of a car and she wants to be able to assert with 95% confidence that the mean of her sample is off by atmost 0.50 minute. If she resume from past experience that $\sigma = 1.6$ minutes, how large a sample will she have to take 6M

9. a) A company claims that its light bulbs are superior to those of its competitor. If a study showed that to sample of n_1=40 of its bulbs has a mean lifetime of 1647 hours of continuous use with a standard deviation of 27 hours. While a sample of n_2=40 bulbs made by its main competitor has a mean life time of 1638 hours of continuous. Does this substantiate the claim at the 0.05 level of significance. 6M

b) Experience has shown that 20% of a manufactured product as of the top quality. In one day's production of 400 articles only 50 are of top quality. Test the hypothesis at 0.05 level. 6M

14EC402

Hall Ticket Number:

II/IV B.Tech (Regular / Supplementary – Repeat Exam) DEGREE EXAMINATION

January, 2021 — **Common to ECE & EIE**

Fourth Semester — **Electronic Circuits-I**

Time: Three Hours — **Maximum :** 60 Marks

Answer ALL Questions from PART-A. (1X12 = 12 Marks)

*Answer **ANY FOUR** questions from PART-B.* (4X12=48 Marks)

Part - A

1. Answer all questions (1X12=12 Marks)
   a) Draw the simplified CE hybrid model of a transistor.
   b) What is the voltage gain of Emitter follower?
   c) Define Peak inverse voltage.
   d) Give the classification of power amplifiers based on conduction angle.
   e) What is rectifier?
   f) Define efficiency of a power amplifier.
   g) Define voltage amplifier.
   h) How the effect of negative feedback on bandwidth.
   i) Define 'feedback factor' of a feedback amplifier.
   j) Define Barkhausen criterion for oscillators.
   k) Differentiate oscillator from amplifier.
   l) Sketch the input and output waveforms of half wave rectifier circuit.

Part - B

2. a) Explain transistor h parameter model with neat sketch and specifying typical value of each element at I_C=1.3mA. 6M
   b) Enumerate importance of Emitter follower with neat sketch. 6M

3. a) Draw the circuit diagram of a Bridge rectifier and explain its operation with necessary derivations. 6M
   b) Define fallowing terms (i) TUF (ii) Cut-in voltage of diode (iii) Break Down voltage of diode (iv) Differentiate barrier potential of silicon and Germanium diodes. 6M

4. a) Draw the circuit diagram of Complementary Symmetry class-B Push pull amplifier and explain its operation. 6M
   b) Distinguish amongst class A, class B operation of amplifiers. 6M

5. a) Draw the small signal model of CS Amplifier and find its small signal voltage gain. 6M
   b) Explain class A power amplifier with neat sketch and derive the expression for maximum Power output. 6M

6. a) What is the effect on input and output impendence of an amplifier if it employs voltage series negative feedback? 6M
   b) Explain the general characteristics of negative feedback amplifiers. 6M

7. a) Derive an expression for gain of negative feedback amplifier with neat diagram. 6M
   b) Derive an expression for input and output resistance of an ideal current shunt feedback amplifier. 6M

8. a) Explain the working of Wien Bridge Oscillator using BJT. Also, derive the expression for the frequency of Oscillation. 8M
   b) A Hartley Oscillator is designed for frequency of 5050K Hz with L1 = 2mH, L2 = 20µH and C then determine value of capacitance C. 4M

9. a) Briefly explain the fallowing. 12M
   (a) Crystal oscillator. (b) RC Phase shift oscillator with BJT.

18EC402

Hall Ticket Number:

II/IV B.Tech(Regular/Supplementary- Repeat Exam) DEGREE EXAMINATION

January, 2021 **Electronics & Communication Engineering**

Fourth Semester **Electronic Circuit Analysis**

Time: Three Hours **Maximum:**50 Marks

Answer All Questions from Part - A. **(1X10 = 10 Marks)**

Answer Any FOUR Questions from Part -BA. **(4X10 = 40 Marks)**

Part –A

1	**Answer all questions**		**(1X10=10 Marks)**	
	a)	Sketch the hybrid model of CE configuration.	CO 1	1M
	b)	List the high input resistance circuits.	CO 1	1M
	c)	Define the transconductance, drain resistance and amplification factor of FET.	CO 1	1M
	d)	List the various distortions in amplifiers.	CO 2	1M
	e)	What is the significance of emitter bypass and coupling capacitors?	CO 2	1M
	f)	Define the conversion efficiency.	CO 2	1M
	g)	List the advantages of negative feedback in amplifiers.	CO 3	1M
	h)	Give the classification of feedback topologies.	CO 3	1M
	i)	State the Barkhausen criterion in oscillators.	CO 4	1M
	j)	Classify the sinusoidal oscillators.	CO 4	1M

Part - B

2	a)	With neat sketch, illustrate the emitter follower circuit with suitable equations.	CO 1	5M
	b)	The emitter follower (CC) has the following h parameters: h_{ie}=1100 Ω, h_{re}=2.5x10^{-4}, h_{fe}=50 and h_{oe}=24μA/V. If R_L=10kΩ and Rs=1kΩ, find the various gains, input impedance and output impedance.	CO 1	5M
3	a)	Derive the amplification factor μ in FET and draw its low-frequency small-signal model.	CO 1	5M
	b)	Discuss the low frequency common-source amplifiers with neat diagrams.	CO 1	5M
4	a)	Illustrate the low-frequency and high frequency response of an amplifier.	CO 2	6M
	b)	Draw the two-stage RC-coupled CE amplifier and explain each element.	CO 2	4M
5	a)	Describe the second-order harmonic distortion in power amplifiers.	CO 2	5M
	b)	With neat diagram explain the class B push-pull power amplifier and derive its conversion efficiency.	CO 2	5M

P.T.O.

6		Illustrate the feedback concept with neat sketch. Also explain the elements of feedback amplifiers.	CO 3	10M
7	a)	Derive the input resistance for voltage-series and current-series feedback amplifiers	CO 3	5M
	b)	Analyze the characteristics of FET source follower voltage-series feedback amplifier.	CO 3	5M
8	a)	Discuss the Barkhausen criterion in oscillators.	CO 4	4M
	b)	Explain the transistor RC phase-shift oscillator and derive its resonant frequency.	CO 4	6M
9	a)	Write short notes on transistor Hartley and Colpitts oscillators.	CO 4	6M
	b)	Draw and explain the 1-MHz crystal oscillator.	CO 4	4M

18EC403

Hall Ticket Number:

II/IV B.Tech(Regular / Supplementary-Repeat Exam) DEGREE EXAMINATION

January, 2021 — **Electronics and Communications Engineering**

Fourth Semester — **EM Waves and Transmission Lines**

Time: Three Hours — **Maximum:**50 Marks

*Answer **All** Questions from **Part – A.*** (10X1 = 10 Marks)

*Answer **ANY FOUR** Questions from **Part – B.*** (4X10 = 40 Marks)

Part - A

1. Answer all questions (10X1=10 Marks)
   a) Define transmission coefficient.(CO1-L1).
   b) What is the range of Reflection coefficient.(CO1-L2).
   c) What is the separation between two successive minima of a standing wave?(CO1-L2)
   d) Write the expression for propagation constant in terms of R,L,G & C. (CO2-L3)
   e) Define Normalized impedance. (CO2-L1)
   f) Define reflection coefficient. (CO2-L1)
   g) Define degenerative modes in waveguide.(CO3-L2)
   h) What is the value of intrinsic impedance in free space. (CO3-L1)
   i) List out any two disadvantages of circular waveguides. (CO4-L2)
   j) State any two characteristics ofTEM waves. (CO4-L2)

Part - B

*Answer any **FOUR** questions.* (4X10=40 Marks)

2. a) Derive an expression for Reflection coefficient and Transmission coefficient fora plane wave reflection by a perfect dielectric at normal incidence.(CO1-L3) 5M
   b) Discuss about surface impedance.(CO1-L2) 5M

3. a) Explain the reflection of a plane wave by a perfect conductor at normal incidence.(CO1-L2) 5M
   b) Explain the reflection of a plane wave by a perfect insulator at oblique incidence for Perpendicular Polarization. (CO1-L4) 5M

4. a) Derive the expression for line impedance. (CO2-L5) 5M
   b) A transmission line has the following parameters: R = 2Ω/m , G = 0.5 mmho/m , nH/m ,C = 0.23 pF ,f = 1 GHz.Calculate: (a) the characteristic impedance; (b) the propagation constant.(CO2-L5) 5M

5. a) Derive the transmission line equations and obtain their solutions. (CO2-L3) 5M
   b) What is impedance matching ? Explain about single stub matching. (CO2-L2) 5M

6. a) Derive electric and magnetic field components for TEmodes in rectangularwaveguide. (CO3-L3) 5M
   b) Discuss the power transmission and power losses in rectangular waveguides.(CO3-L2) 5M

7. a) Compare the general characteristics of TE and TM modes in rectangular wave guide (CO3-L2) 5M
   b) An air-filled rectangular waveguide of inside dimensions 7 cm x 3.5 cm operates in the dominant TE_{10} mode . a.) Find the cutoff frequency b). Determine the phase velocity of the wave in the guide at a frequency of 3.5 GHz.(CO3-L4). 5M

8. a) Derive electric and magnetic field components for TM modes in circular waveguide.(CO4-L4) 5M
   b) Explain about wave impedance and excitation modes in circular wave guides. (CO4-L2) 5M

9. a) Derive the characteristics of TE and TM in circular waveguide.(CO4-L3) 5M
   b) The propagation of TEM waves does not exist in hallow waveguides. Why? (CO4-L2) 5M

18EC404

Hall Ticket Number:

II/IV B.Tech(Regular / Supplementary – Repeat Exam) DEGREE EXAMINATION

January, 2021 **Electronics and Communication Engineering**

Fourth Semester **SIGNALS AND SYSTEMS**

Time: Three Hours **Maximum:**50 Marks

Answer ALL Questions from PART-A. (10X1 = 10 Marks)

*Answer **ANY FOUR** questions from PART-B.* (4X10=40 Marks)

Part - A

1. Answer all questions (10X1=10 Marks)

a)	Define Signal and System.	CLO-1	
b)	What is system modeling?	CLO-1	
c)	What is the fundamental period of $\boldsymbol{g(t) = 7\,cos(400\,\pi\,t)}$?	CLO-1	
d)	State Dirichlet's conditions.	CLO-2	
e)	What is an LTI system?	CLO-2	
f)	Define Convolution.	CLO-2	
g)	What is the Fourier Transform of **δ(t)**?	CLO-3	
h)	What is a filter?	CLO-3	
i)	Define Nyquist Rate.	CLO-4	
j)	Define Correlation.	CLO-4	

Part - B

2. a) Graph the following functions:

$$\boldsymbol{i.\,g(t) = 5\,sgn(t-4)}$$
$$\boldsymbol{ii.\,g(t) = 5\,r(t+1)}$$
$$\boldsymbol{iii.\,g(t) = 2\,u(4-t)}$$

CLO-1 6M

b) Find the even and odd parts of these signals: CLO-1 4M

$\boldsymbol{i.\,g(t) = 2t^2 - 3\,t + 6}$

$\boldsymbol{ii.\,g(t) = sinc(t)}$

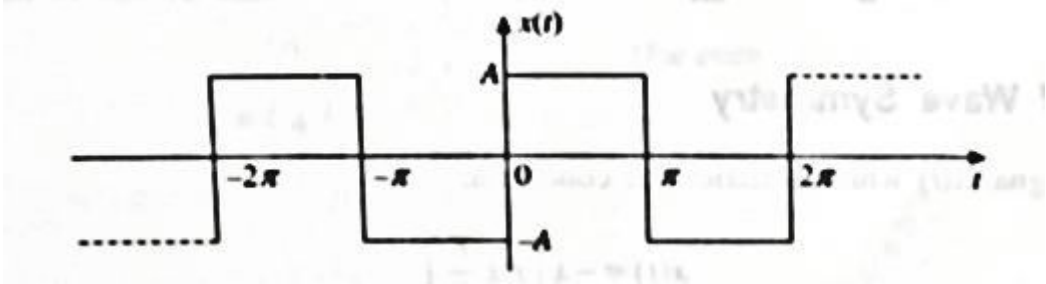
3. How systems are classified? Explain with examples. CLO-1 10M

4. a) Perform the convolution of the following signals using graphical procedure: CLO-2 6M

$$\boldsymbol{x(t) = e^{-3t}\,u(t) \quad and \quad h(t) = u(t+3)}$$

b) List the steps for graphical procedure of convolution. CLO-2 4M

5. Compute the trigonometric Fourier series expansion of the signal shown below CLO-2 10M



P.T.O.

6.	a)	State and prove the following properties of continuous time Fourier transforms: i. Frequency Shifting ii. Convolution	CLO-3	10M
7	a)	Compute the Fourier Transform of $\mathbf{x(t) = t\, e^{-at}\, u(t)}$	CLO-3	5M
	b)	Compute the Fourier Transform of $\mathbf{x(t) = e^{at}\, u(-t)}$	CLO-3	5M
8.	a)	State and Prove Sampling Theorem	CLO-4	10M
9.	a)	Prove that Autocorrelation and Energy Spectral Density Form a Fourier Transform Pair.	CLO-4	6M
	b)	Compare Energy Spectral Density and Power Spectral Density.	CLO-4	4M

18EC406

Hall Ticket Number:

II/IV B.Tech (Regular / Supplementary – Repeat Exam) DEGREE EXAMINATION

January, 2021 — **Electronics and Communication Engineering**

Fourth Semester — **Professional Ethics & Human values**

Time: Three Hours — **Maximum:** 50 Marks

Answer ALL Questions from PART-A. (1X10 = 10 Marks)

*Answer **ANY FOUR** questions from PART-B.* (4X10=40 Marks)

PART-A

1.	a)	What do you understand by 'Value'	CO1	1M
	b)	Define 'Integrity'	CO1	1M
	c)	What do you mean by 'Empathy'?	CO1	1M
	d)	Name various senses of Engineering Ethics	CO2	1M
	e)	Differentiate between Consensus and Controversy	CO2	1M
	f)	What are the uses of Ethical Theories?	CO3	1M
	g)	Define 'Safety'	CO4	1M
	h)	What do you mean by Confidentiality?	CO4	1M
	i)	What is full form of IIPR?	CO5	1M
	j)	Define Computer Ethics?	CO5	1M

PART-B

2.	a)	What are different types of values? Explain them clearly	CO1	5M
	b)	What are civic virtues? Explain them briefly	CO1	5M
3.	a)	What do you understand by Service Learning? Explain	CO1	5M
	b)	Explain the concepts of 'Valuing Time & Courage'	CO1	5M
4.	a)	Explain Engineering Ethics clearly	CO2	5M
	b)	Discuss Kohlberg's law on Moral Autonomy	CO2	5M
5.	a)	What is Moral dilemmas? Explain	CO2	5M
	b)	Discus Gilligan's theory on moral autonomy	CO2	5M
6.	a)	'Engineering is a social experimentation'. Explain	CO3	5M
	b)	Describe in detail the concept of Risk-Benefit Analysis	CO3	5M
7.	a)	Describe in detail the concept 'Codes of Ethics'	CO4	5M
	b)	What are various professional Rights and Employee rights	CO4	5M
8.	a)	Explain the role of an Engineer as Expert witness and Advisors	CO5	5M
	b)	Explain environmental Ethics Clearly	CO5	5M
9.	a)	What is code of Ethics followed by IETE?	CO5	5M
	b)	What are different ways that MNCs follow ethics in expanding their companies?	CO5	5M