



UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, HAWABSHAH
MID-SEMESTER EXAMINATION OF SECOND SEMESTER - SECOND YEAR (4TH SEMESTER) 2022-20 BATCH B.E (IT)

SUBJECT: ENGINEERING ECONOMICS AND MANAGEMENT

Dated: 25.11.2022

Maximum Marks: 20

Time Allowed: 01 Hour

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No		CLO	Taxonomy Level	PLO	Marks
01 (a)	Apply the relationship of the demand and supply with price for validation and draw a figure and discuss the equilibrium point.	1	A3	11	04
01 (b)	<p>Analysis the effect of change in demand with respect to following cases:</p> <p>CASE: 1a) Effects of an Increase in Demand</p> <p>CASE: 1b) Effects of a Decrease in Demand</p> <p>CASE: 2a) Effects of an Increase in Supply</p> <p>CASE: 2b) Effects of a Decrease in Supply</p>	1	A3	11	06
02 (a)	<p>Aqsa Ali Enterprises has the following details: Fixed cost = Rs. 40,00,000, Variable cost per unit = Rs. 300, Selling price per unit = Rs. 500</p> <p>Find: (a) The break-even sales quantity (b) The break-even sales (c) If the actual production is 1,20,000, find (i) Contribution (ii) Margin of safety by all methods</p>	1	A3	11	05
02 (b)	<p>Data for Aftab Company Ltd. has the following details: Sales = Rs. 2,40,000, Fixed cost = Rs. 50,000 Variable cost = Rs. 75,000</p> <p>Find: (a) Contribution (b) Profit (c) BEP (d) Margin of safety</p>	1	A3	11	05
03	<p>Apply the basic concept of Economics to describe the following terms:</p> <p>1) Opportunity Cost</p> <p>2) Marginal Cost</p> <p>3) Microeconomics</p>	1	A3	11	10



QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID-SEMESTER EXAMINATION OF SECOND SEMESTER – SECOND YEAR (4TH SEMESTER) 2022-20 BATCH I, B.E (TC)

SUBJECT: COMPLEX VARIABLES & TRANSFORMS

Dated: 22.11.2022

Maximum Marks: 20

Time Allowed: 01 Hour

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.	Question	CLOs	Taxonomy Level	PLOs	Marks
Q. 01	(a) Define Analytic function, Harmonic function and singularity of complex function with examples.	1	C1	2	05
	(b) Write the following in the form of $a+ib$. i. $i^{n/2}$ ii. $(1-\sqrt{3}i)^4$	1	C6	2	05
Q. 02	(a) If $x = \cos\theta + i\sin\theta$ then show that $x^n + \frac{1}{x^n} = 2\cos n\theta$.	1	C3	2	06
	(b) Show that $f(z) = x^3 + iy^3$ satisfy the CR-equations at the point $z = 0$, but is not analytic there.	1	C3	2	04
Q. 03	(a) Discuss the limit of complex function and prove that $\lim_{z \rightarrow 1} \left(\frac{z^n - 1}{z - 1} \right) = n$, where n is positive integer.	1	C2	2	05
	(b) Discuss the continuity of complex function and show that $f(z) = \begin{cases} \frac{z^2 + 4}{z - 2i}, & z \neq 2i \\ z + 2i, & z = 2i \end{cases}$ is continuous at $z = 2i$.	1	C2	2	05

The End



QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH

MID-SEMESTER EXAMINATION OF SECOND SEMESTER - SECOND YEAR (4TH SEMESTER), 20 BATCH B.E (TC)

SUBJECT: SIGNAL AND SYSTEMS

Dated: 23.11.2022 **Maximum Marks: 20** **Time Allowed: 1 Hour**

NOTE: ATTEMPT ANY TWO (02) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q.	QUESTION	CLO	Taxonomy Level	Marks
Q. 01	Define energy and power of a signal also write down mathematical expression for both discrete time and continuous time.	1	C2	10
Q. 02	Define even and odd signal. Drive an expression for even and odd signal computation for $x(t)$. Also calculate the even and odd part of the signal.	1	C2	10
Q. 03	What do you mean by transformation of signal, discuss in detail time scaling, shifting and time reversal of a signal.	1	C2	10

The End



ID. No/Seat No. 20Tc 14

QUAID-E-AWAM UNIVERSITY OF ENGINEERING SCIENCE AND
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**MID EXAMINATION 2022 OF FOURTH SEMESTER SECOND YEAR
(20 BATCH) OF B.E. (TELECOMMUNICATION ENGINEERING)**

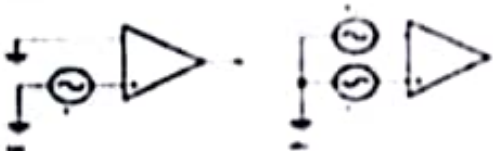
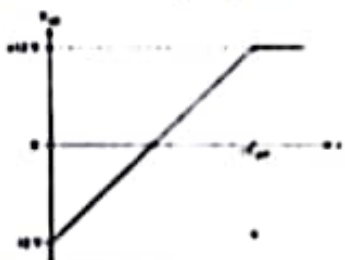
Subject: Linear Integrated Circuits

Dated: 24-11-2022

Time Allowed: 1 Hour (3 C 11)

Max Marks: 20

NOTE: ATTEMPT ANY TWO QUESTIONS.

Q. No		CLO	Taxonomy Level	Marks
01(a)	Discuss the advantages and disadvantages of Integrated circuits.	1	C2	03
01(b)	Identify the type of input mode for each Op-Amp in the following Figures: 	1	C1	03
01(c)	The open-loop gain of a certain op-amp is 175,000. Its common-mode gain is 0.18. Determine the CMRR in decibels.	2	C3	04
02(a)	Draw the circuits of case-1 case-2 and case-3 of DC analysis of Differential amplifier using BJTs of Op-Amp	1	C1	06
02(b)	The input currents to an op-amp are 6 μ A and 5 μ A. Calculate the bias current I_{bias} .	2	C3	04
03(a)	Name any four parameters of the Op-Amp	1	C1	03
03(b)	Define the relation of Gain with the bandwidth in terms of Gain Bandwidth product of Op-Amp	1	C1	03
03(c)	The output voltage of an op-amp in response to a step input is shown in the following Figure. Determine the slew rate? 	2	C3	04

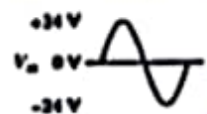
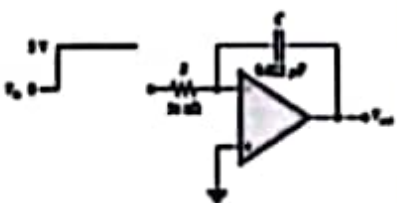
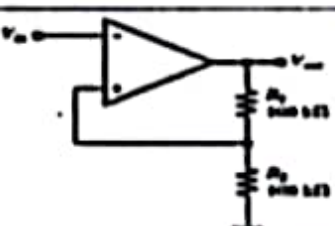
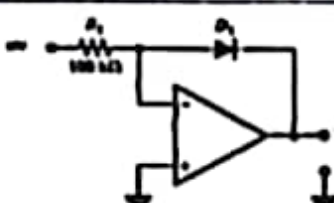
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Q. No.	QUESTION	CLOs	Taxonomy Level	Marks
Q. 01 (a)	Apply the basic principles of economics to define the following terms. a) capital cost b) interest rate c) opportunity cost d) revenue e) monopoly f) administration	1	A3	6
(b)	A person wishes to have a future sum of Rs. 1,00,000 for his son's education after 10 years from now. What is the interest rate compounded annually that the bank gives if single payment that he deposits now is Rs. 24,720 so that he gets this amount after 10 years? (Cash flow diagram is necessary)	1	A3	6
Q. 02 (a)	A person who is now 35 years old is planning for his retired life. He plans to invest an equal sum of Rs. 10,000 at the end of every year for the next 25 years starting from the end of the next year. The bank gives 20% interest rate, compounded annually. Find the maturity value of his account when he is 60 years old. (Cash flow diagram is necessary)	1	A3	6
(b)	A company has to replace a present facility after 15 years at an outlay of Rs. 5,00,000. It plans to deposit an equal amount at the end of every year for the next 15 years at an interest rate of 18% compounded annually. Find the equivalent amount that must be deposited at the end of every year for the next 15 years. (Cash flow diagram is necessary)	1	A3	6
Q. 03 (a)	Discuss the modern and traditional definitions of management.	2	C2	4
(b)	What are different functions of management? Support your answer with the help of management process diagram.	2	C2	8
Q. 04	What are the various applications of Industrial Management? Support your answer with the help of application hierarchy.	2	C2	12
Q. 05	What is a feasible study? Discuss various types of feasibility study?	2	C2	12

Good Luck



Q. No		CLO	Cognitive Level	Marks
01(a)	Draw the equivalent circuit of the following: I. Inverting and Non-Inverting Amplifier II. Op-Amp Differentiator III. Binary Weighted DAC and R2R ladder DAC	1	C1	08
01(b)	Define the two characteristics of Op-Amp comparator.	1	C1	04
02(a)	Compare the following: I. Precision rectifier with ordinary rectifier II. Linear signal compression with logarithmic signal compression	1	C4	08
02(b)	Define the term hysteresis and its uses in comparator circuit of op-amp.	1	C1	04
03(a)	Discuss the uses of peak detectors and voltage limiters.	1	C2	06
03(b)	Draw the output voltage waveforms of positive and negative clamper with respect to given input voltage. 	2	C1	06
04(a)	Calculate the value of output resistance R_f , if input resistance R_i is 10 K Ohm and the inverting op-amp close loop gain is 5.	2	C3	4
04(b)	Ideal Integrator is shown in figure. The output voltage is initially zero. The pulse width is 100 μ sec. I. Determine the rate of change of the output voltage in response to the input square wave II. Calculate the output and draw the waveform. 	2	C3	08
05(a)	Determine the upper and lower trigger points for the comparator circuit in Figure. Assume that $+V_{out(max)} = +15V$ and $-V_{out(max)} = -15V$. 	2	C3	06
05(b)	Determine the output voltage for the log amplifier shown in the figure. Assume $I_R = 25nA$. 	2	C3	06

Q. No.	Question	CLOs	Taxonomy Level	Marks
Q.01	Which are the various types of charge distributions? Explain. State the units of line charge density, surface charge density and volume charge density.	1	C1	10
Q.02	Consider a cylinder of length L and radius R as shown in figure. Obtain its volume by integration.	1	C3	10
Q.03	Calculate the field intensity at a point on a sphere of radius $3m$ as shown in figure. If a positive charge of $2\mu C$ is placed at the origin of the sphere.	1	C4	10

The End



SUBJECT: SIGNALS AND SYSTEMS

Dated: 12.01.2023

Maximum Marks: 60

Time Allowed: 3 Hour

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.	QUESTION	CLO	Taxonomy Level	PLO	Mark
Q.01	(a) Define System and how they are interconnected, enlist different properties of a system. Discuss any two in detail with examples	2	C2	2	04
	(b) Find the convolution of the following signals: $x[k] = (1\ 2\ 3\ 4\ 5)$ and $h[k] = (4\ 3\ 2\ 1)$ $x(t) = e^{-at}u(t)$, $a > 0$ and $h(t) = u(t)$	2	C3	2	04
Q.02	(a) Consider a periodic signal $x(t)$, with fundamental frequency ω_0 , express the equation in the form of linear combinations for $N=7$. The equation and its co-efficient are given as $x(t) = \sum_{i=-1}^1 a_i e^{j i \omega_0 t}$ $a_0 = 1$, $a_1 = a_{-1} = \frac{1}{4}$, $a_2 = a_{-2} = \frac{1}{2}$, $a_3 = a_{-3} = \frac{1}{3}$ Also verify your result graphically.	2	C3	3	06
	(b) Define poles and zeros of a system. How it is used to measure the system stability. Determine the poles and zeros also plot them over s-plane. $X(s) = \frac{3s+12}{s^2+2s+5}$	2	C2	3	06
Q.03	Define Laplace Transform discuss the different steps to find the system output. Consider the system: $y''(t) + 5y'(t) + 6y(t) = x(t)$. Find $y(t)$ for $t \geq 0$ if $x(t) = u(t)$ and the initial conditions are: $y(0) = 2$ and $y'(0) = -12$	3	C3	4	12
Q.04	(a) Define filters, discuss in detail frequency selective filters. Also draw magnitude and phase response of each filter	3	C2	4	06
	(b) Define poles and zeroes of a filter drive an expression for n-th order Butterworth filter by considering the cut off frequency as ω_c .	2	C3	3	06
Q.05	(a) Derive the transfer function of a second order Butterworth filter. The cut-off frequency is 1 radian per second. Also Find 1. Poles of the filter 2. Plot the poles over the s plane 3. Discuss the stability of the filter	3	C3	3	09
	(b) Discuss the conditions for distortion less transmission, drive an expression for magnitude and phase response of the system also plot the both responses.	3	C3	4	04

SUBJECT: COMPLEX VARIABLES & TRANSFORMS

Dated: 23.01.2023

Maximum Marks: 60


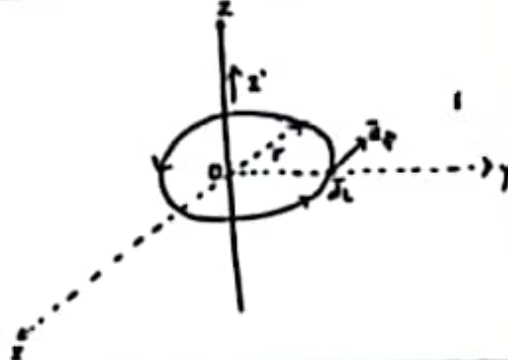
Time Allowed: 03 Hours

NOTE: ATTEMPT ALL QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q. No.	QUESTION	CLOs	Taxonomy Level	POs	Marks
Q.01 (a)	Define Differentiation of complex function? And use the rules of differentiation to find $f'(z)$ for the given functions. i. $f(z) = (z^4 - 2iz^3 + z)^{10}$ ii. $f(z) = \frac{(iz^3 - 2z)}{(3z + 1 - i)}$ iii. $f(z) = -5iz^2 + \frac{(2+i)}{z^3}$	2	C1	3	06
(b)	Prove that $U(r, \theta) = r^n \cos(n\theta)$ is Harmonic function in the entire complex plane.	2	C5	3	06
Q.02 (a)	If $w = f(z)$ is an analytic function then show that $\frac{df}{dz} = 0$.	2	C2	3	06
(b)	Prove that $f(z) = \frac{\cos \theta}{r} - i \frac{\sin \theta}{r}$ is an analytic function.	2	C5	3	06
Q.03 (a)	Define Simple pole, pole of order n and residue at simple pole and residue at pole of order n ? Find poles and residue at each pole of the given function. $f(z) = \frac{3z-1}{z^3+2z+5}$	3	C1	3	06
(b)	State the Green's theorem and verify Green's theorem: $\int_C (x^2 + xy) dx + (x^2 + y^2) dy$, where C is square formed by lines $x = \pm 1$ and $y = \pm 1$	3	C2	3	06
Q.04 (a)	Define Cauchy's Integral formula and Cauchy's Integral formula for derivative? and Evaluate the following integrals. i. $\int_C \left(\frac{z}{z^2+9} \right) dz$, where C is the circle $z-2i =4$ ii. $\int_C \left(\frac{z+1}{z^4+2iz^3} \right) dz$, where C is the circle $z =1$	3	C1	3	06
(b)	Define the Laplace transform and by using definition of Laplace compute the following. i. t^4 ii. e^{-3t} iii. $\cosh(at)$	3	C1	3	06
Q.05 (a)	Evaluate: $\int_{1-i}^{1+i} (z^2 + z) dz$ i. Along the line joining points $(1, -1)$ and $(2, 3)$. ii. Along path: $y = x^2$	3	C5	3	06
(b)	Find the following Inverse Laplace transforms: i. $L^{-1} \left(\frac{1}{s} + \frac{1}{s-1} \right)$ ii. $L^{-1} \left(\frac{2s+1}{s^3+1} \right)$ iii. $L^{-1} \left(\frac{4}{s-2} + \frac{5s}{s^3-4} \right)$	3	C1	3	06

The End



Q. No.	QUESTION	CLOs	Taxonomy Level	Marks
Q. 01	(a) State and prove Gauss law.	1	C1	06
	(b) Drive Maxwell's first equation as applied to electrostatics using Gauss's law.	3	C2	06
Q. 02	Consider an infinite line charge with density ρ_l C/m, along z-axis. Obtain the work done if a point charge Q is moved from $r=a$ to $r=b$ along the radial path.	3	C3	12
				
Q. 03	Consider a infinitely long straight conductor, as-shown in figure using Ampere's circuital law, find H due to this infinitely long straight conductor.	1	C3	12
				
Q. 04	(a) Drive the expression for the capacitance of co-axial cable.	2	C2	06
	(b) A cylindrical capacitor of length 8cm is made of two concentric rings having an inner radius as 3cm and outer radius as 6cm. Calculate the capacitance of capacitor.	3	C3	06
Q. 05	Discuss any two of the following: 1. Faraday's law 2. Bolt-Savart law 3. Maxwell's equations in point form and Integral form 4. Magnetic field due to solenoid	2	C2	12