Dated: 13.03.2023   Maximum Marks: 20   Time Allowed: 01 Hour.

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

Q. No.	Question	CLO	Taxonomy Level	PLO	Mark
Q. 01	Define organization. Discuss different resources of an organization.	1	C1	1	10
Q. 02	What do you know about organizational aspects enlist all visible and hidden aspects of an organization. Discuss one from each.	1	C2	1	10
Q. 03	Define analysis. Also discuss three levels of analysis with suitable examples.	1	C1	1	10

The End

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

MID-SEMESTER EXAMINATION OF FIRST SEMESTER – THIRD YEAR (5TH SEMESTER) 2023, 20-BATCH, B.E (TC)

SUBJECT: DIGITAL SIGNAL PROCESSING

Dated: 06.03.2023   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)	Describe basic elements of digital signal processing.	1	C2	1	06
01 (b)	Enlist advantages and disadvantages of digital signal processing over analog signal processing.	1	C1	1	04
02 (a)	An LTI system with impulse response h(n) = [1 1 1 1 1] is applied with input x(n) = [1 2 4]. Calculate the output of the LTI system.	1	C3	1	05

02 (b)	Define following properties of a system.
	  i. Time Invariance
	  ii. Linearity
	  iii. Stability
		1	C1	1	05

03 (a)	Calculate Z transform of following sequences. $I.\ x[n] = \{1, 2, 7, 0, 0, 1\}$ $II.\ x[n] = \left(\frac{1}{3}\right)^{n} u[n] - \left(\frac{1}{2}\right)^{n} u[-n-1]$	2	C3	2	05
03 (b)	Calculate Inverse Z Transform of $$X[z] = \frac{1}{1 - 1.5z^{-1} + 0.5z^{-2}}$$ a. ROC : $\lvert z \rvert > 1$ b. ROC : $\lvert z \rvert < 0.5$	2	C3	2	05

The End

Dated: 08.03.2023   Maximum Marks: 20   Time Allowed: 01 Hour.

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

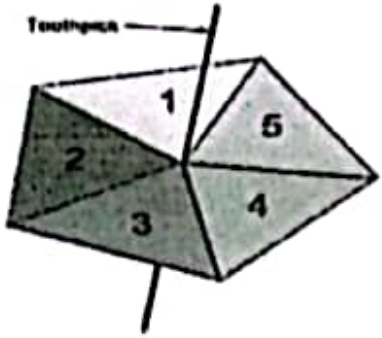| Q. No		CLO	Taxonomy Level	Marks
01 (a)	Draw the block diagram of multiplexer at transmitter.	1	C1	02
01 (b)	Differentiate the following: i. Analog and Digital signals. ii. Baseband and Broadband transmission iii. Transmitter and Transceiver	1	C4	04
01 (c)	For a non-linear amplifier with two input frequencies 3 KHz and 8 KHz Determine: i. First three harmonics present in the output for each input frequency. ii. Cross-product frequencies produced for values of m and n of 2 and 3 respectively.	2	C3	04
02 (a)	Enlist the types of external noises.	1	C1	02
02 (b)	Define the following: i. Johnson Noise ii. Intermodulation distortion	1	C1	04
02 (c)	Determine Thermal noise power in watts and dBm for an electronic device operating at a room temperature of 28°C with the bandwidth of 20 kHz.	2	C3	04
03 (a)	Name the parameters on which information carrying capacity depends according to Claude E. Shannon.	1	C1	02
03 (b)	Define the relation of the following: i. Noise factor and quality of the receiver ii. SNR and performance of communication system	1	C1	04
03 (c)	For a nonlinear amplifier and given parameters of Input signal power $3*10^{-15}$ Watt, Noise power $3*10^{-20}$ Watt power gain 1,000,000 Internal noise (N_d) $6*10^{-12}$ Watt. Determine: i. Input S/N ratio (dB) ii. Output S/N ratio (dB) iii. Noise factor	2	C3	04

---The End---

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

Q. No		CLO	Taxonomy Level	Marks
01(a)	The diagram shows a spinner made up of a piece of card in the shape of a regular pentagon, with a toothpick pushed through its center. The five triangles are numbered from 1 to 5. The spinner is spun until it lands on one of the five edges of the pentagon. Compute the probability of an event such that the number it lands on is odd?	1	C3	05
01(b)	In an examination 30% failed in course A, 20% in B and 5% failed in both. If a student is selected at random I. Compute the probability of the event that he failed in A or B? ii. If a selected student is found to have failed in A, compute the probability of the event that he failed in B.	1	C3	05
02(a)	Derive the Total Probability and Bayes Theorem.	1	C4	05
02(b)	A, B and C are three machines producing bolts. Machine A produces 10,000 bolts/hr. Machine B produces 15,000 bolts/hr and machine C produces 25,000 bolts/hr. A can produce 2% defective bolts and B can produce 5% and C produces 10%. If a bolt is selected at random, **Calculate** the probability that I. Bolt is defective ii. If it is found defective what is the probability that it was produced by machine A.	1	C3	05
03(a)	Compare and contrast the continuous random variable and discrete random variable with the help of suitable examples and differentiate their properties	2	C4	05
03(b)	The transmission time X of messages in a communication system obeys the exponential probability law with parameter λ, that is $$P(X>x) = e^{-\lambda x} \text{ for } x > 0$$ Compute i. Cdf of X ii. $P(T<X \le 2T)$ Where $T = 1/\lambda$	2	C3	05

The End

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

MID SEMESTER EXAMINATION OF FIRST SEMESTER – THIRD YEAR 20-BATCH OF BE (TC)
SUBJECT: WAVE PROPAGATION AND ANTENNAS

Dated: 10-03-2023   Maximum Marks: 20   Time Allowed: 1 Hour

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

Q. No	QUESTION	CLO	Taxonomy Level	PLO	
01	A Transverse Electric signal propagates in a rectangular waveguide having the dimensions equal to 2π cm $\times$ π cm. Determine the following. (i) Define WR with a figure and mention the dimensions (ii) Enlist different features of WR (iii) Define Cutoff frequency in waveguides with figure (iii) Cutoff frequency for the first four modes (iv) Location of all modes (line diagram) $C = 3\times10^8$ m/sec $\pi = \dfrac{22}{7}$	1	C3	01	
02	A 140 Ω lossless transmission line is terminated in a load impedance $Z_L = (280 + j182)$ Ω, if $\lambda = 72$ cm, determine the following quantities with suitable figures. a) Define Reflection Coefficient (Γ) b) Define VSWR c) Determine Γ d) Determine VSWR	1	C3	01	
03	Write a brief note on the following terms with figure (if any). (a) Phase Velocity and Group Velocity (b) Lumped and Distributed Models (c) Dielectric Materials and Properties (d) Difference between waveguides and transmission lines (e) TE and TM modes of propagations	1	C2	01	

—The End—

Dated: 29.05.2023 _____ Maximum Marks: 60 _____ Time Allowed: 3 Hou

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

Q. No		CLO	Taxonomy Level	Marl
01(a)	DFT is used to calculate the spectrum for discrete time signals. Compute FFT of following sequences and interpret the results. a. $x[n] = [0,1,2,3]$ b. $h[n] = [2, 1, 2, 1]$	1	C2	06
01(b)	Express the reasons which make Ideal filters impractical?	1	C2	06
02	A filter with transfer function is given by $$H[Z] = \frac{1}{2}(1 - z^{-1}).$$ Solve to determine a. Nature of Filter b. Frequency Response $H(e^{\cdot})$ c. Magnitude and Phase Response d. Group Delay	2	C3	12
03(a)	Differentiate between DFT and FFT. Also discuss similarities and differences.	1	C3	06
03(b)	Draw 8-point FFT butterfly diagram.	1	C2	06
04(a)	Provide a detailed analysis of Finite impulse response (FIR) and Infinite impulse response (IIR) filters, including their respective general forms. Additionally, please construct a diagram to illustrate their structures.	2	C3	06
04(b)	Examine the significance of poles and zeros in ensuring system stability. Analyze the stability of a system specifically with poles represented in both the z-plane and s-plane	2	C3	06
05	What is your understanding of Pulse Code Modulation (PCM)? Outline the necessary steps involved in converting a continuous-time signal into a digital signal using PCM. Additionally, explore the relationship between quantizer resolution and quantization noise.	1	C2	12

Good Luck

SUBJECT: WAVE PROPAGATIONS AND ANTENNAS

Dated: 12.06.2023   Maximum Marks: 60   Time Allowed: 3 I

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

Q. No		CLO	Taxonomy Level	N
01	Discuss the following atmospheric layers: (i) Troposphere (ii) Stratosphere (iii) Mesosphere (iv) Thermoshpere	01	C2	
02(a)	Discuss the IONIZATION and RECOMBINATION processes occurrence in the ionization layer	01	C4	
02(b)	How long would an arm of the following antennas be for AM1100? (i) Dipole Antenna (ii) Monopole Antenna	02	C3	
03(a)	State and Explian Yadi-Uda antenna along with frequency range, radiation pattern and applications.	02	C2	
03(b)	A transmitting antenna is on a 80-ft tower and the receive antenna is on 40 ft tower. How far apart is the potential distance between them?	02	C3	
03(c)	Discuss in briefly the Radiation Pattern of an antenna in terms of Major and Minor Lobes with a suitable figure.	02	C2	
04(a)	Explain different types of dipole antennas.	02	C2	
04(b)	Find the solid angle of in Ω (steradian) of a spherical cap on the surface over a North Pole region defined by spherical angle of $0 \leq \theta \leq 30$, of $0 \leq \emptyset \leq 360$, and $dA = r^2 \sin d\theta\, d\emptyset$.	02	C3	
05	Discuss the following with the help of diagram (if any): 1) Horn Antenna. 2) Solid Angle. 3) Radiation Patten with Lobes. 4) Parabolic Reflector 5) FNBW and HPBW. 6) Antenna Efficiency.	02	C2	

The-End

SUBJECT: ORGANIZATIONAL BEHAVIOR

Dated: 12.06.2023   Maximum Marks: 60   Time Allowed: 3 H

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

Q. No.	QUESTION	CLO	Taxonomy Level	PLO
Q. 01	What do you mean by conflict, how a manager can best manages with this situation? Also discuss the different resolution techniques to face with this situation. Elaborate graphically the relationship between conflict and group performance	2	C2	09
Q. 02 (a)	Define team and different types of teams. Also discuss in detail the characteristics of effective teams.	2	C1	09
(b)	Elaborate toxic people, discuss in detail the different signs of toxic peoples and how to deal with them.	2	C3	09
Q. 03 (a)	What do you know about motivation? Discuss in detail motivation process with the help of block diagram.	2	C2	09
(b)	Discuss in detail perception and its characteristics how it is helpful in an organization development.	3	C3	12
Q. 04	What do you about group? Discuss different types of groups and group development process in detail. Write down advantages and disadvantages of a group	3	C3	12
Q. 05	Discuss in detail Manager and leader in an organization. Discuss different types of leader and its role in an organization. Write down the difference between a manager and leader.	3	C2	12

The End

QUAID-E-AWAM UNIVERSITY OF ENGINEERING, SCIENCE & TECHNOLOGY, NAWABSHAH
FINAL SEMESTER REGULAR EXAMINATION OF FIRST SEMESTER – THIRD YEAR, 2023 OF 20-BATCH, B.E (T
SUBJECT: PROBABILITY & STOCHASTIC PROCESSES

Dated: 05.06.2022   Maximum Marks: 60   Time Allowed: 3 H

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

Q. No.		QUESTION	CLOs	Taxonomy Level	PLOs
Q.01	(a)	A man either drives his car or takes a train to work each day. Suppose he never takes train two days in a row, but if he drives to work, then the next day he is just as likely to drive as he is to take the train. At the 1st day he tosses a coin if head comes then he takes a train otherwise he drives. Solve to calculate I. The TPM. II. Also find the probability that he will use car to get to work after two days?	3	C3	3
	(b)	Three boys A, B, C are throwing a ball to each other. A always to B & B always throw to C but C is as likely to throw ball to B as A. If the initial probability distribution of three states A, B & C = 0.3, 0.4 & 0.3 respectively. Solve to calculate I. TPM II. $P(X_2=B)$ III. $P(X_3= B, X_2= C, X_1= B, X_0= A)$ The distribution of the balls after two rounds.	3	C3	3
Q.02	(a)	The probability that a patient recovers from cancer disease is exponentially distributed with value of 0.001. If it is known that 30 people are suffering from this disease. Solve to calculate the probability that I. No person will survive II. from 2 to 4 persons will survive III. At least one person will survive and IV. d) At most one person will survive from this disease.	2	C3	2
	(b)	The number of telephone calls in the central switching board of an office building are exponentially distributed and averages 4 calls per minute. Solve to calculate the probability that I. No calls will arrive in a given one minute period II. At least two calls will arrive in a one minute period. III. At least two calls will arrive in two minute period.	2	C3	2
Q.03	(a)	Upon studying low bids for manufacturing firm finds that intrastate contracts have low bids that are uniformly distributed between 20 and 25, in units of thousands of dollars. Solve to calculate the probability that low bid on next intrastate contract is I. below \$22,000 II. in excess of \$24,000 III. the average cost of low bids on contracts of this type.	2	C3	2
	(b)	A firm that sells word processing systems keeps track of customers who call on any one day and the number of orders placed on any one day. Let x_1 denoted the number of calls, x_2 the number of orders placed and $p(x_1,x_2)$ is the joint probability of x_1 & x_2. Records indicate that, P(0,0) = 0.04 ; P(1,0) = 0.16 P(1,1) = 0.10; P(2,0) = 0.20, P(2,1) = 0.30; P(2,2) = 0.20 Solve to calculate Cov(x1,x2)	2	C3	2

P.T.O

Q. 04	(a)	The height of the students in a school is normally distributed with mean $\mu = 65$ cm, and standard deviation of 5 cm. If a student is selected at random, solve to Calculate the probability that
		   i. The height will be greater than 70 cm
		   ii. The height will be between 70 cm & 75 cm
		   iii. Height Between 60 & 70 cm
		   iv. Height less than 50 cm
		   (Refer to the table provided)
			2	C3

	(b)	A communication system transmits binary information over a channel that introduces random bit errors with probability of error $P(E) = 10^{-1}$ The transmitter transmits each information bit three times and a decoder takes a majority votes of the received bits to decide on what the transmitted bit was. Using the Binomial distribution solve to Calculate the probability that two or more bits received are in error.	2	C3
Q. 05	(a)	Explain the stochastic process, its types with the help of suitable examples.	1	C2
	(b)	Discuss the importance of the subject of probability and stochastic process in the field of telecommunication with some real time applications.	1	C2

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998
3.6	0.4998	0.4998	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.7	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.8	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999	0.4999
3.9	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000

The End

SUBJECT: COMMUNICATION SYSTEMS

Dated: 01.06.2023   Maximum Marks: 60   Time Allowed: 3 H

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

Q. No.		QUESTION	CLOs	Taxonomy Level	PLOs	M
Q.01	(a)	Discuss the operation of Amplitude modulation with a Diode and draw circuits.	1	2	1	
	(b)	Define the effects of over, under and critical modulation in amplitude modulation with the conditions of modulation index and waveforms.	1	1	1	
	(c)	Name the types of AM used to reduce the power consumption and improve the bandwidth utilization of conventional AM.	1	1	1	
Q.02	(a)	Write the advantages and disadvantages of LC oscillator and Crystal oscillator.	1	1	1	
	(b)	Discuss the operation of pulse averaging discriminator of FM with circuit diagrams.	1	2	1	
	(c)	Discuss why there is the need of finding the significant sidebands and how they can be calculated in Frequency modulation?	1	2	1	
Q.03	(a)	Identify the difference between ideal, natural and flat top sampling using waveforms.	1	1	1	
	(b)	Differentiate the following: i. Sampling and quantization ii. Quantizing noise and slope overload noise in DM	1	1	1	
	(c)	Draw the waveforms of PAM, PWM and PPM.	1	2	1	
Q.04	(a)	An AM signal has a Carrier power of 30W and carrier frequency of 150MHz and an amplitude of 9V peak. It is modulated by a sine wave with a frequency of 12KHz and a peak voltage of 3 V. Determine the following: 1. Calculate the total transmitted power using above values 2. Frequencies LSB & USB produced at its output	2	3	2	
	(b)	An AM signal has a maximum positive envelope voltage of 15 V and a minimum of 6 V. Find the modulation index.	2	1	2	
Q.05	(a)	An FM signal has a deviation of 498 kHz and a modulating frequency of 166 kHz. Use Bessel function table 1. Calculate the following: i. Modulation index. ii. Show the significant sidebands for above modulation index iii. Bandwidth using Bessel function and Carson's rule.	2	3	2	
	(b)	A multiplexer combines three channels, one with a bit rate of 200 kbps and two others with a bit rate of 100 kbps. using a time slot of 1 bits. Calculate the following: i. Frame rate and Frame duration ii. Bit rate and Bit duration iii. Number of bits in each frame	2	3	2	

The End