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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2019

SUBJECT: OPTICAL COMMUNICATION (2161005) (EC)

DATE: 29-01-2019 TIME: 02:00 pm to 3:30 pm TOTAL MARKS:40

Instructions:
1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1	(a)	Define the followings: (i) Refractive index (ii) Leaky Modes and Guided Modes (iii) Normalized frequency.	[03]
	(b)	Draw the refractive index profile of step index and graded index fiber.	[03]
	(c)	A step index fiber in air has a numerical aperture of 0.16, a core refractive index of 1.45 and a core diameter of 60 μm. Calculate refractive index of cladding and acceptance angle.	[04]
Q.2	(a)	Describes the advantages of optical communication over conventional communication. State the optical transmission windows.	[06]
	(b)	Define Numerical Aperture of fiber optic cable. Derive the relation between numerical aperture and acceptance angle of fiber with the help of neat diagram.	[05]
	(c)	Compare single mode and multimode fibers.	[04]
		OR	
Q.2	(a)	Using simple ray theory, describe the basic principle of light propagation in optical fiber with the help of neat diagram. Also, give the requirements of cladding material of fiber.	[06]
	(b)	Prove that intermodal dispersion is less in multimode graded index fiber as compared to multimode step index fiber.	[05]
	(c)	Explain the basic principle of LED with the help of energy band diagram.	[04]
Q.3	(a)	Describe scattering losses in optical fiber in detail.	[06]
	(b)	Explain Outside Vapour Phase Deposition (OVPD) process of fiber fabrication with the help of neat diagram.	[05]
	(c)	Justify: Dispersion limits the maximum bit rate attainable by optical fiber.	[04]
		OR	
Q.3	(a)	Write a short note on intrinsic and extrinsic absorption losses in optical fiber.	[06]
	(b)	Explain Modified Chemical Vapour Phase Deposition (MCVD) process of fiber fabrication with the help of neat diagram.	[05]
	(c)	Draw and explain the basic block diagram of optical fiber communication system.	[04]

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2019

SUBJECT: TELECOMMUNICATION SWITCHING SYSTEMS & NETWORKS (2161103) (EC)

DATE: 30-01-2019 TIME:02:15 pm to 03:45 pm TOTAL MARKS:40

Instructions: 1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1	(a)	Explain simplex telephone system.	[03]
	(b)	Classify the switching systems.	[03]
	(c)	Define Following Terms: (i) Side tone (ii) Erlang (iii) Fully connected Network (iv)Centum Call Second	[04]
Q.2	(a)	Explain drive mechanism of a rotary switch.	[06]
	(b)	Discuss about a telephone circuit with side-tone coupling.	[05]
	(c)	State the difference between Micro-programmed control and Hard-wired control.	[04]

OR

Q.2	(a)	Describe centralized Store Programmed Control (SPC) switching with following three modes. (i)Standby Mode (ii)Synchronous duplex mode (iii)Load sharing mode.	[06]
	(b)	Explain Cross Bar Switching system in details.	[05]
	(c)	Write down Difference between Strawger switching system and crossbar switching system.	[04]
Q.3	(a)	Describe Distributed Store Programmed Control switching with Level-1, Level-2 and Level-3 processing.	[06]
	(b)	Derive the formula for availability and non- availability of microprocessor for single as well as dual processor case.	[05]
	(c)	If Mean Time Between Failure [MTBF] = 2000 hours and Mean Time To Repair [MTTR]= 4 hours, then calculate the unavailability for single and dual processor systems.	[04]

OR

Q.3	(a)	Briefly describe all the elements of manual switching circuit.	[06]
	(b)	Draw the block diagram of 2- stage space division switching and discuss about total number of switching elements, and call blocking probability with proper mathematical background.	[05]
	(c)	State the difference between single stage and multistage stage space division switching.	[04]

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE – SEMESTER – VI • MID SEMESTER- I EXAMINATION – SUMMER 2019

SUBJECT: DIGITAL COMMUNICATION (2161001) (EC)

DATE: 31-01-2019 TIME: 02:15 PM to 03:45 pm TOTAL MARKS:40

Instructions:
1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1	(a)	Why Delta Modulation is called as 1-bit DPCM.	03
	(b)	Explain conditional probability with the help of Baye's rule.	03
	(c)	What is Aliasing? Explain it in detail.	04
Q.2	(a)	State and prove the Sampling theorem with necessary equation and waveforms.	06
	(b)	Derive the formula for signal to quantization noise ratio for PCM.	05
	(c)	Explain T1 carrier system in detail.	04
		OR	
Q.2	(a)	What is Delta Modulation? Draw the block diagram of Delta modulator transmitter and explain its working with waveforms.	06
	(b)	What are the functions of regenerative repeater and Explain its working with necessary block diagram.	05
	(c)	List the advantages of digital communication over analog communication.	04
Q.3	(a)	What is Probability Density Function? State and prove its properties.	06
	(b)	The PDF of a random variable x is given by $F_X(x) = 1/2\pi$ for $0 \leq x \leq 2\pi$ $= 0$ otherwise Calculate the mean value, mean square value, variance and standard deviation.	05
	(c)	Explain the concept of probability with suitable example.	04
		OR	
Q.3	(a)	Define Cumulative Distribution Function (CDF). State and Prove properties of CDF.	06
	(b)	In a random experiment, a trial consists of four consecutive tosses of a coin. If we define an RV X as the number of heads appearing in trial, determine probabilities $P_x(x)$ and CDF $F_x(x)$.	05
	(c)	What is scrambling? Explain scrambler with equation.	04

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2019

SUBJECT: VLSI TECHNOLOGY & DESIGN (2161101) (EC)

DATE: 01-02-2019 TIME: 02:15 pm to 3:45 pm TOTAL MARKS:40

Instructions:
1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1	(a)	State and discuss Moore's law.	[03]
	(b)	Draw VLSI design cycle in terms of flow chart.	[03]
	(c)	Discuss Top-to-Bottom and Bottom-to-Top design methodology for VLSI.	[04]
Q.2	(a)	Explain VLSI Design flow using Y-chart.	[06]
	(b)	Explain the concept of structural hierarchy with the help of example.	[05]
	(c)	Compare full custom design and standard-cell based design techniques.	[04]
		OR	
Q.2	(a)	Explain a typical field programmable Gate Array (FPGA) chip with the help of structural diagram and basic functional units.	[06]
	(b)	Explain the concept of structural regularity with the help of example.	[05]
	(c)	Compare full custom and semi-custom design styles.	[04]
Q.3	(a)	Explain the process steps required for the fabrication of nMOS transistor with the help of diagrams.	[06]
	(b)	Explain the working of MOS transistor in Accumulation, Depletion and Inversion layer with the help of energy band diagrams for three corresponding regions.	[05]
	(c)	Discuss Lambda layout design rule with the help of example.	[04]
		OR	
Q.3	(a)	Explain the process steps required for the fabrication of CMOS transistor with the help of diagrams. Also indicate the significance of well type regions into the substrate.	[06]
	(b)	With neat sketch explain gradual channel approximation and derive the equation for drain current in linear region mode and saturation mode.	[05]
	(c)	Draw the Energy band diagrams of the components that make up the MOS system.	[04]

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2019

SUBJECT: ANTENNA & WAVE PROPAGATION (2161003) (EC)

DATE: **02-02-2019** TIME:02:15 PM to 03:45 pm TOTAL MARKS: 40

Instructions:
1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1	(a)	Define antenna with its functions.	03
	(b)	Explain Antenna field zones.	03
	(c)	Explain the difference between transmission line and antenna.	04
Q.2	(a)	Write a short note on types of antennas with necessary figures.	06
	(b)	Define the following parameters of an antenna: (I) Directivity (ii) Radiation Intensity (iii) Radiation Pattern (iv) HPBW (v) FNBW	05
	(c)	Derive and explain Friss transmission formula.	04

OR

Q.2	(a)	Explain radio Communication link between transmitting antenna and receiving antenna	06
	(b)	Explain three dimensional radiation pattern of an antenna. How to obtain Half Power Beam Width (HPBW) from the given field radiation pattern?	05
	(c)	Derive the expression for radiation resistance of a Hertzian Dipole Antenna. And Find the Radiation resistance of a Hertzian dipole of length λ/40, λ/60, λ/80.	04
Q.3	(a)	With necessary figure and derivations explain N element array of equal amplitude and spacing. Write the equation for array factor.	06
	(b)	Explain the principle of Pattern Multiplication with the help of example.	05
	(c)	Explain the polarization of wave and describe linear polarization.	04

OR

Q.3	(a)	Derive the expression for the far field pattern of an array of 2-isotropic point sources with equal amplitude and phase of feed currents.	06
	(b)	Explain Binomial array with examples.	05
	(c)	An antenna is having a field pattern given by $E(\theta) = \cos\theta$ for $0 < \theta < 90$. Find the HPBW and FNBW.	04