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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2018

SUBJECT: Optical Communication (2161005) (Electronics & Communication Engineering)

DATE: 29/01/2018 TIME: 14:15 to 15:45 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) Briefly describe the block diagram of optical communication systems. [05]

(b) Define following: [05]
(i) Refraction
(ii) Critical Angle
(iii) Snell's Law
(iv) Reflection
(v) Phase Velocity

Q.2 (a) What is equilibrium numerical aperture? Give the significance of the same. [06]
(b) Briefly describe the OVPO. [05]
(c) Give in brief the comparison of S.M. and M.M. fibers. [04]

OR

Q.2 (a) Give difference between graded index and step index. Also define 'V' Number. [06]
(b) Briefly describe the PCVD. [05]
(c) Outline the applications of the optical communication. [04]

Q.3 (a) A step index fiber in air has a NA of 0.16, a core refractive index of 1.45 and a core diameter of 60 μm. Determine the normalized frequency for the fiber when light at a wavelength of 0.82 μm is transmitted. Estimate the number of guided modes propagating in the fiber. [06]
(b) Explain the advantage and disadvantages of optical communication system using optical fiber over conventional copper system as a transmission link. [05]
(c) Briefly describe TIR. [04]

OR

Q.3 (a) A silica optical fiber has n_1=1.50 and n_2=1.47. [06]
Find (i) Critical Angle, (ii) Numerical Aperture, (iii) Acceptance Angle
(b) What are the bending losses in fiber optic communication? [05]
Describe (i) Micro bending losses, (ii) macro bending losses.
(c) Explain intramodal and intermodal dispersion in details. [04]

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2018

SUBJECT: Telecommunication Switching systems and Networks (2161103) (EC)

DATE: 30-01-2018 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 following terms: [05]
1. Trunk
2. Busy hour
3. Point to point network
4. Fully connected network
5. Erlang

(b) Describe Birth-Death process with the help of state transitions in contest of telephone traffic. [05]

Q.2 (a) Explain Lost calls cleared (LCC) system with finite sources and derive the equation of Blocking probably. [06]

(b) Describe the terms of GOS and blocking probability [05]

(c) In a group of 10 servers, each is occupied for 60 minute in an observation interval of two hours calculate the traffic carried by group. [04]

OR

Q.2 (a) Explain Lost calls cleared (LCC) system with infinite sources and derive the equation of Blocking probably. [06]

(b) Give classification of Switching systems. [05]

(c) An exchange severs 4000 subscribers if the average BHCA is 10,000 and the CCR is 60%, calculate the busy hour calling rate. [04]

Q.3 (a) Describe centralized Store Programmed Control (SPC) switching with following modes. [06]
1. Standby Mode
2. Synchronous duplex mode

(b) Give classification of Switching elements. [05]

(c) A subscriber makes three phone calls of 3 minutes, 4 minutes and 2 minutes duration in a one hour period. Calculate the subscriber traffic in erlangs, CCS and CM. [04]

OR

Q.3 (a) Draw and explain simplex and half-duplex telephone circuits with necessary equations. [06]

(b) Briefly describe all the elements of manual switching circuit. [05]

(c) Explain Synchronous duplex mode of Dual processor with necessary diagram. [04]

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2018

SUBJECT: DIGITAL COMMUNICATION (2161001) (EC)

DATE: **31-01-2018** 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)	Discuss the need of Adaptive Delta Modulation.	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)	Draw and explain block diagram of ADPCM system. Compare PCM and ADPCM.	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 is PCM? Draw the block diagram of a PCM Transmitter(encoder).Explain Its operation with waveforms.	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)	Define: (i) The n^{th} moment of random variable (ii) The central moment of random variable (iii) Variance (iv) Standard Deviation (v) Mean	05
	(c)	A certain random variable has CDF given by: $F_X(x) = 0$ for $x \leq 0$ $= kx^2$ for $0 < x \leq 10$ $= 100k$ for $x > 10$ Calculate: (1) Calculate the value of k (2) Find the values of $p(x \leq 5)$ and $p(5 < x \leq 7)$ (3) Plot the corresponding PDF	04

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2018

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

DATE: 01-02-2018 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 function of CMOS inverter. Draw Layout of CMOS inverter.	[03]
	(b)	Draw Stick Diagram of CMOS Inverter.	[03]
	(c)	Explain VLSI Top Down and Bottom Up Approach with suitable Example.	[04]
Q.2	(a)	Draw and Describe Fabrication Steps of nMos in detail.	[06]
	(b)	Define terms Regularity, Modularity and Locality with suitable example.	[05]
	(c)	Explain Channel length Modulation	[04]
		OR	
Q.2	(a)	Explain MOSFET Capacitance in detail.	[06]
	(b)	Explain Current Voltage Characteristics of MOSFET and derive equation of I_D in all region.	[05]
	(c)	Write difference between Full Custom and Semi custom Design.	[04]
Q.3	(a)	Explain MOSFET operation in all three regions with suitable figure.	[06]
	(b)	Explain Y chart in detail.	[05]
	(c)	Draw and explain VLSI design Flow.	[04]
		OR	
Q.3	(a)	What do you mean by FPGA and CPLD. Explain in detail.	[06]
	(b)	What is MOSFET scaling?.Explain in detail.	[05]
	(c)	Give your words about Layout Design Rules.	[04]

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER-I EXAMINATION – SUMMER 2018

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

DATE: **02-02-2018** 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 an antenna. Show the fields radiating from an oscillating dipole.	03
	(b)	Explain Antenna field zones.	03
	(c)	Explain Beam Area or Beam Solid angle (Ω_A) of an antenna in detail.	04
Q.2	(a)	Derive the expressions of electric field and magnetic field of a quarter wave monopole.	06
	(b)	Define the following parameters of an antenna: (I) Directivity (ii) Radiation Intensity (iii) Gain (iv) Radiation Resistance (v) FNBW	05
	(c)	Discuss Reciprocity theorem of an antenna.	04
		OR	
Q.2	(a)	Derive the expressions of electric field and magnetic field of a current element or oscillating dipole.	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 Friis Transmission formula.	04
Q.3	(a)	For two element array consisting ideal radiators carrying equal currents in phase, obtain positions of maxima and minima of the radiation pattern, if the spacing between two elements is $\lambda/2$.	06
	(b)	Explain the principle of Pattern Multiplication with the help of example.	05
	(c)	Discuss the usefulness of Dolph-Chebysheff polynomail in antenna array synthesis.	04
		OR	
Q.3	(a)	Explain Schulknoff theorem and show its usefulness.	06
	(b)	Define Broadside Array and find out its pattern maxima and minima.	05
	(c)	For uniform linear array of n isotropic point sources of equal amplitude and spacing, obtain expression of resultant electric field. Also, show Array Factor in the equation.	04