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06EC61

Sixth Semester B.E. Degree Examination, December 2010
Digital Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. State the sampling theorem. Show that the spectrum of a sampling signal $G_s(f) = f_s \sum_{n=-\infty}^{\infty} G(f - mf_s)$. **(07 Marks)**

b. Explain the quadrature sampling with related block diagram, spectra and equations. **(06 Marks)**

c. With related block diagram, equations and waveforms, explain original signal g(t) recovery from a flat-top sampled signal, using sample and hold circuit. **(07 Marks)**

2 a. What is meant by 'Idle channel noise'? Explain with two memoryless quantizer types. **(06 Marks)**

b. 24 analog signals, each having a bandwidth of 10 kHz are to be time-division multiplexed and transmitted via PAM/AM. A guard band of 5 kHz is required for signal reconstruction from the PAM samples of each signal.
   i) Determine the sampling rate for each signal.
   ii) Find the transmission bandwidth.
   iii) Draw the functional diagram of the transmitter and receiver of TDM signal. **(06 Marks)**

c. What is meant by robust quantization? Derive the equation for variance of quantization error (σ_Q^2) from the basic principle of non-uniform quantizer. **(08 Marks)**

3 a. What are the types of quantization noises, which occur in delta modulation? Explain with a neat sketch and equations. **(07 Marks)**

b. Draw the digital data format for a given sequence 0 1 1 0 1 1 0 0 0 1 corresponding to i) Bipolar RZ ii) Manchester iii) Polar quaternary (natural code). **(07 Marks)**

c. Obtain the power spectral density of NRZ polar format. **(06 Marks)**

4 a. Explain modified duobinary technique, with a block diagram along with frequency and impulse response sketches. **(09 Marks)**

b. What is meant by 'eye pattern' in the data transmission system? Explain. **(07 Marks)**

c. Write a note on adaptive equalization. **(04 Marks)**

PART – B

5 a. With a block diagram concept, explain the coherent binary FSK – transmitter and receiver. **(08 Marks)**

b. For a given input binary sequence 0 1 1 0 1 0 0 0 , sketch the inphase and quadrature phase components of QPSK. Then by adding these two waveforms, draw the final QPSK waveform. **(06 Marks)**

c. Explain the non-coherent DPSK system. **(06 Marks)**

6 a. Define conceptual model of a digital communication system. **(08 Marks)**
b. Prove the Gram-Schmidt orthogonalization procedure. **(12 Marks)**

7 a. State and prove the three properties of matched filter. **(12 Marks)**
b. With a neat block diagram, explain the quadrature receiver, using correlators. **(08 Marks)**

8 Write short notes on:
a. Pseudo noise (PN) sequence
b. Frequency hopping
c. Spread binary PSK system
d. Applications of spread spectrum. **(20 Marks)**

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06EC62

Sixth Semester B.E. Degree Examination, December 2010
Microprocessors

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain the architecture of 8086 microprocessor, with a neat diagram, along with functions of each block and register. **(12 Marks)**

b. Explain the advantages of segmentation. **(04 Marks)**

c. If DS = CBAO H , CS = 4000 H, SI = 4567 H and IP = 2055 H, what is the address of the instruction that is fetched? What is the address of the data? **(04 Marks)**

2 a. Explain the following instructions:
i) XLAT ii) SCASB iii) LEA BX, 56H[SI] iv) AAA. **(04 Marks)**

b. Define the assembler directive. Explain the following directives:
i) DW ii) PTR iii) EVEN iv) PROC. **(06 Marks)**

c. Explain with example following addressing modes in 8086:
i) Register addressing ii) Based indexed addressed
iii)Variable port addressing iv) Stack memory addressing **(10 Marks)**

3 a. Explain the following pins of 8086:
i) $\overline{LOCK}$ ii) $\overline{BHE}$ / S_7 iii) HOLD iv) DT / $\overline{R}$ **(04 Marks)**

b. Write an ALP to transfer 10 words of data using REP MOV SW instruction from source location to destination location. What is the role of SI, DI registers and DF bit? **(06 Marks)**

c. Write a MACRO function
i) to read a character with echo
ii) to display a character
iii) to read a character without echo
iv) to display a text message
v) to read a string of characters. **(10 Marks)**

4 a. Bring out the differences between MACRO and procedure. **(05 Marks)**

b. Write an ALP to multiply a 2-digit BCD number by a single digit BCD number by repeated addition using DAA instruction. **(05 Marks)**

c. Explain the types of interrupts along with action taken by 8086, when an interrupt occurs. Also, explain interrupt vector table. **(10 Marks)**

PART – B

5 a. Write the control word format of 8255. Explain with a block diagram, how to interface 4×4 keyboard with 8086 using 8255. **(10 Marks)**

b. Interface eight 7-segment display, using 8255 with 8086. Write an ALP to display 1, 2, 3, 4, 5, 6, 7, 8 over the eight 7-segment displays continuously. **(10 Marks)**

6 a. Explain the different 8087 data types along with their format. **(10 Marks)**

b. Explain the control register format of 8087. **(05 Marks)**

c. Explain the following instructions:
   i) FMULP ST(1), ST
   ii) FSQRT
   iii) FLD QWORDPTR[SI]
   iv) FLDPI
   v) FBLD LOC **(05 Marks)**

7 a. With a block diagram, explain the maximum mode of operation of 8086. **(10 Marks)**

b. Write a note on universal serial bus (USB). **(10 Marks)**

8 a. Explain with structure the special 80386 registers. **(08 Marks)**

b. Write the features of 80486 processor and Pentium processor. **(12 Marks)**

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06EC63

Sixth Semester B.E. Degree Examination, December 2010
Analog and Mixed Mode VLSI Design

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART - A

1 a. With reference to a DAC describe :
i) Resolution ii) LSB iii) DNL iv) INL v) V_{FS} vi) Dynamic range.
Find the value of 1 LSB and V_{FS} for a 4–bit, 8–bit and 10–bit DAC. V_{Ref} = 5V. **(12 Marks)**

b. Determine the DNL and INL for a 3–bit non–ideal DAC with the given output values. Comment on the monotonocity.

Digital code	Analog value
000	0V
001	0.625 V
010	1.5625 V
011	2 V
100	2.5 V
101	3.125 V
110	3.4375 V
111	4.375 V

(08 Marks)

2 a. Draw the transfer curve for a 3–bit ADC with ramp input. Explain what is quantization error. Plot the quantization error graph for an ideal ADC. **(10 Marks)**

b. Explain the mixed signal layout issues. **(10 Marks)**

3 a. Design a 3–bit DAC using binary switch array. Assume V_{Ref} = 5V and power dissipation 5 mW. Find the analog value for the input D = 101. Draw the diagram and the path traced for D = 101. **(08 Marks)**

b. With a neat diagram, explain the working of a cyclic DAC. Find the value of the output voltage at the end of each cycle for N = 4 V_{Ref} = 5V and D = 1101. **(12 Marks)**

4 a. Explain the working of a successive approximation ADC, with a block diagram. For the ADC, give the intermediate values for V_{Ref} = 8V, N = 3 and V_{in} = 3.5V. **(12 Marks)**

b. Explain the working of a voltage comparator, with the help of a block diagram. **(08 Marks)**

PART - B

5 a. Give the Z domain representation of a two path averager and plot the magnitude and phase response of the digital filter. **(10 Marks)**

b. If the input sinewave to an averager has a peak amplitude of 0.5V and a frequency of 20MHz, determine the peak amplitude of the averager output and the delay through the circuit. **(06 Marks)**

c. Develop an expression for the effective number of bits, in terms of the measured SNR, if the input sinewave has a peak amplitude of 40% of $V_{Ref+} - V_{Ref-}$. **(04 Marks)**

6 a. With the help of a block diagram, explain the accumlate and dump circuit. Plot the general frequency response of an averaging filter. **(10 Marks)**

b. Specify the accuracy required of an 8–bit ADC, if it is to be used to attain 12 bits with INL and DNL of ± 0.5 LSBS $V_{Ref} = 1.5$ V. **(06 Marks)**

c. Discuss the advantages and disadvantages of cascading averaging circuits to increase filter attenuation. **(04 Marks)**

7 a. Explain the concept of interpolation. **(08 Marks)**

b. Explain how MOSFET behaves as a capacitor. Explain floating MOS capacitor. **(08 Marks)**

c. Explain the simple delay element using pass transistors and CMOS inverters. **(04 Marks)**

8 a. Draw the arrangement for a 4 –bit pipelined adder and full adder bit implemented using dynamic logic. **(08 Marks)**

b. Explain the limitation of an inverter at the output of an op-amp, with the help of its transfer curve. How is it overcome? **(06 Marks)**

c. Explain true single phase clocking (TSPC). Using TSPC explain the delay element. **(06 Marks)**

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06EC64

Sixth Semester B.E. Degree Examination, December 2010
Antennas and Propagation

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain the following parameters of antenna :
   i) Beam solid angle
   ii) Radiation intensity
   iii) Effective height
   iv) Band width. **(12 Marks)**

   b. Find the relation between maximum effective aperture and directivity. **(04 Marks)**

   c. An antenna has a field pattern given by $E(\theta) = \cos\theta \cos 2\theta$ for $0 \le \theta \le 90^\circ$. Find :
   i) The half – power beam width.
   ii) The beam width between first nulls. **(04 Marks)**

2 a. The radiation intensity of an antenna is given by $U = \cos^4\theta \sin^2\phi$ for $0 \le \theta \le \frac{\pi}{2}$ and $0 \le \phi \le 2\pi$. Find the directivity. **(05 Marks)**

   b. Calculate the maximum power received at a distance of 0.5 km over a free space 1GHz circuit consisting of transmitting antenna with 25 dB gain and a receiving antenna gain of 20 dB. Assume the transmitting antenna input is 150 Watts. **(06 Marks)**

   c. State and explain power theorem. **(04 Marks)**

   d. Explain field and phase pattern. **(05 Marks)**

3 a. Derive an expression for total field in case of two isotropic points with same amplitude and opposite phase. Plot the relative field pattern when these two isotropic sources are spaced $\lambda/2$ apart. **(08 Marks)**

   b. State and explain the principle of pattern multiplication. Calculate and plot the field pattern of an array of two non isotropic dissimilar sources for which the total field is given by $E = \cos\phi + \sin\phi \angle\psi$, where $\psi = \frac{\pi}{2}(\cos\phi + 1)$. Take source 1 as the reference as shown in Fig.Q.3(b). **(06 Marks)**

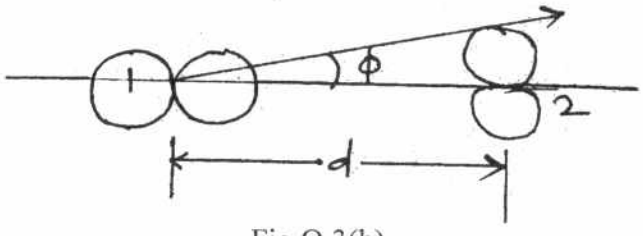

Fig.Q.3(b).

   c. For a broadside array of n isotropic point source of equal amplitude and spacing, show that $\phi_0 = \cos^{-1}\left(\pm\frac{K\lambda}{nd}\right)$, where ϕ_0 gives the null directions. Find the null directions for an array of 4 isotropic point sources with $\lambda/2$ spacing. **(06 Marks)**

4 a. Derive the expression for the radiation resistance of short dipole. **(06 Marks)**

b. Show that the radiation resistance of a linear $\lambda/2$ antenna with sinusoidal current distribution is equal to 73 Ω. **(08 Marks)**

c. Obtain the field pattern for a dipole of length i) $\lambda/2$; ii) $3\lambda/2$. **(06 Marks)**

PART – B

5 a. Obtain the expression for the instantaneous electric field and magnetic field at a large distance r from a loop of any radius a. **(08 Marks)**

b. State and explain Babinet's principle. **(06 Marks)**

c. Explain microstrip antennas with neat sketches and mention its advantages. **(06 Marks)**

6 Write short notes on :

a. Log periodic antenna. **(05 Marks)**

b. Turnstile antenna. **(05 Marks)**

c. Embedded antennas. **(05 Marks)**

d. Antennas for ground penetrating radar. **(05 Marks)**

7 a. Describe the factors affecting ground wave propagation. **(06 Marks)**

b. Find the approximate formula for the field strength in VHF propagation and explain how it varies sinusolidally. **(10 Marks)**

c. A VHF communication is to be established at 90 MHz, with the transmitter power of 35 Watts. Calculate the LOS communication distance, if the heights of transmitter and receiver antennas are 40 m and 25 m respectively. **(04 Marks)**

8 a. Define the following as related to ionospheric propagation :

i) Virtual height

ii) Maximum usable frequency

iii) Skip distance. **(06 Marks)**

b. Derive the expression for refractive index of an ionospheric layer. **(08 Marks)**

c. An electromagnetic wave at frequency f is propagating through a lossy dielectric medium having conductivity σ, permittivity $E = E_0E_r$, and permeability $\mu = \mu_0$. Derive an expression for the attenuation per unit length of the medium, if $\frac{\sigma}{w \in} << 1$. Show that the attenuation is given by $60\pi\sigma/\sqrt{Er}$. **(06 Marks)**

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06EC65

Sixth Semester B.E. Degree Examination, December 2010
Information Theory and Coding

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Define : i) Amount of information ii) Average source information rate. **(04 Marks)**

b. Derive an expression for average information content of symbols in long independent sequences. **(04 Marks)**

c. A discrete memory less source contains source alphabet

$S = \{S_1, S_2, S_3, S_4\}$ with $P = \left\{\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{8}\right\}$

i) Calculate the entropy of the source

ii) Calculate the entropy of the second order extension of the source. **(04 Marks)**

d. For the state diagram of the Markov source of the Fig. Q1(d), find

i) State probabilities ii) Entropy of each state iii) Entropy of the source. **(08 Marks)**

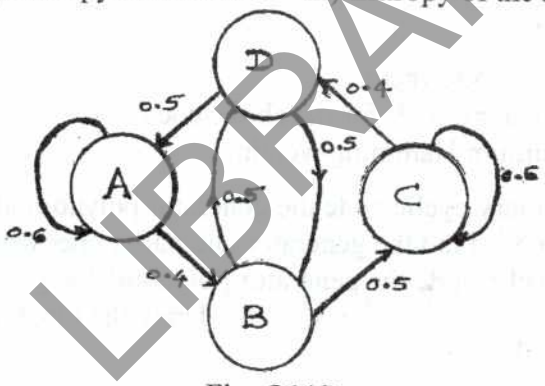

Fig. Q1(d)

2 a. Derive the expression for code efficiency and code redundancy. **(06 Marks)**

b. Explain the steps in the Shannon's encoding algorithm for generating binary codes. **(04 Marks)**

c. Apply Shannon's encoding algorithm and generate binary codes for the set of messages given in table Q2(c), and obtain code efficiency and redundancy. **(10 Marks)**

Table Q2(c)

m_1	m_2	m_3	m_4	m_5
1/8	1/16	3/16	1/4	3/8

3 a. What is a discrete communication channel? Illustrate the model of a discrete channel. **(04 Marks)**

b. A discrete memoryless source has an alphabet of seven symbols with probabilities for its output as described in table Q 3(b). Find

i) Shannon – Fano code for this source ii) Coding efficiency. **(08 Marks)**

Table Q3(b)

S_0	S_1	S_2	S_3	S_4	S_5	S_6
1/4	1/4	1/8	1/8	1/8	1/16	1/16

c. A zero memory source is with

$S = \{S_1, S_2, S_3, S_4, S_5, S_6\}$ and $P = \{0.4, 0.2, 0.1, 0.1, 0.1, 0.05, 0.05\}$

Construct a binary Huffman code by placing the composite symbol as high as possible and determine the variance of the word lengths. **(08 Marks)**

4 a. Define mutual information and explain its properties. **(04 Marks)**

b. For a channel, the matrix is given as

$$P(Y/X) = \begin{bmatrix} 0.6 & 0.2 & 0.2 \\ 0.2 & 0.6 & 0.2 \\ 0.2 & 0.2 & 0.6 \end{bmatrix}.$$ **(06 Marks)**

Find I(X : Y) and channel capacity, given the input symbol occur with equal probability.

c. State and explain Shannon – Hartley law. **(06 Marks)**

d. For an AWGN channel with 4 KHz bandwidth and noise power spectral density $\frac{No}{2} = 10^{-12}\,W/Hz$, the signal power required at the receiver is 0.1 mW. Calculate the capacity of this channel. **(04 Marks)**

PART – B

5 a. Illustrate the following terms used in error control coding with examples.
i) Block length ii) Code rate iii) Hamming weight iv) Hamming distance. **(08 Marks)**

b. Prove that $GH^T = HG^T = 0$ for a systematic linear block code. **(04 Marks)**

c. For a systematic (6, 3) linear block code

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

i) Find all the code vectors
ii) Draw encoder circuit for the above code
iii) Find minimum Hamming weight. **(08 Marks)**

6 a. For a (7, 4) binary cyclic code the generator polynomial is given by $g(x) = 1 + x + x^3$. Find the generator and parity check matrices. **(10 Marks)**

b. In a (15, 5) cyclic code the generator polynomial is given by $g(x) = 1 + x + x^2 + x^4 + x^5 + x^8 + x^{10}$. Draw the block diagram of an encoder and syndrome calculator for this code. **(10 Marks)**

7 a. For the convolution encoder shown in Fig. Q7(a), the information sequence is d = 10111. Find the output sequence using time – domain approach. **(06 Marks)**

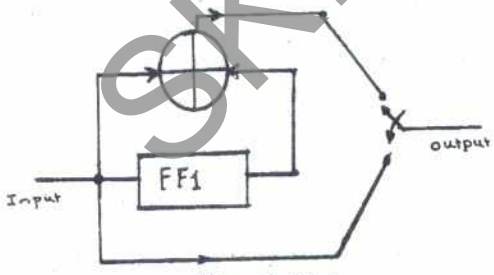

Fig. Q 7(a)

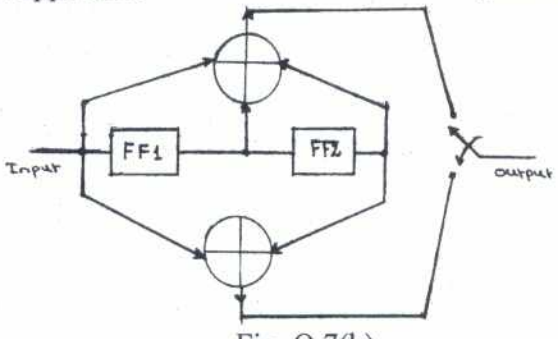

Fig. Q 7(b)

b. For the convolution encoder shown in Fig. Q7(b), draw the
i) State table ii) State transition table iii) State diagram iv) The corresponding code tree
v) Using the code tree find the encoded sequence for the message (10111). **(14 Marks)**

8 Write short notes on
a. Shortened cyclic code
b. Burst error correcting codes
c. BCH code
d. Reed Soloman codes. **(20 Marks)**

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06EC661

Sixth Semester B.E. Degree Examination, December 2010
Programming in C++

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What are the advantages of object oriented languages over procedure oriented languages? **(06 Marks)**

b. List a few areas of application of OOP technology. **(06 Marks)**

c. What is enumerated data type? Explain. **(08 Marks)**

2 a. Write a C++ program to find the prime numbers between 200 and 500 using for loop. **(06 Marks)**

b. What are manipulators? Explain the usage of the same with an example. **(06 Marks)**

c. Name the operators which are common for C and C++. Indicate its precedence and associativity. Also mention the operators which are exclusive for C++. **(08 Marks)**

3 a. What are unconditional control statements? Explain with an example. **(10 Marks)**

b. Write a C++ recursive program to find the factorial of a number. **(10 Marks)**

4 a. Write a C++ program to swap two numbers using 'call by address' Explain the mechanism. **(10 Marks)**

b. What is inline function? Explain with an example. What are the limitations of inline functions? **(10 Marks)**

PART – B

5 a. What is exception handling? With an example, briefly explain try, throw and catch mechanisms in C++. **(10 Marks)**

b. What are the benefits of operator overloading? With a program, explain the concept of operator overloading with unary operator. **(10 Marks)**

6 a. Explain different types of constructors, with example. **(10 Marks)**

b. Write a C++ program to calculate the surface area and volume of a sphere using equations $4\pi r^2$ and $4/3\ \pi r^3$ where 'r' is the radius of the sphere using class 'sphere' and object 'mysphere' and member functions as vol( ) and s-area( ). **(10 Marks)**

7 a. What is inheritance? Briefly explain public, private and protected inheritance, with an example. **(10 Marks)**

b. What is multiple inheritance? Explain with one C++ program. **(10 Marks)**

8 Write short notes on the following :

a. New and delete operators. **(06 Marks)**

b. Class destructor. **(07 Marks)**

c. Friend functions. **(07 Marks)**

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06EC662

Sixth Semester B.E. Degree Examination, December 2010
Satellite Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, choosing at least two questions from each part.***

PART – A

1 a. What are the frequency bands allocated to various satellite services? **(04 Marks)**

b. State and explain the Kepler's laws of planetary motion. **(08 Marks)**

c. Define the terms: i) Prograde orbit ii) Apogee iii) Argument of perigee iv) Ascending node. **(08 Marks)**

2 a. Determine the rate of regression of the nodes and the rate of rotation of the line of apsides for a satellite making 14.23304826 revolutions / day. The semimajor axis of the orbit is 7192.3 km, orbit eccentricity is 0.0011501 and the inclination is 98.6328 deg. **(08 Marks)**

b. Explain earth eclipse of satellite. **(06 Marks)**

c. Differentiate sidereal day and solar day. **(04 Marks)**

d. Explain sun transit outage. **(02 Marks)**

3 a. Explain atmospheric losses and ionospheric losses for satellites. **(08 Marks)**

b. The noise figure for the system shown in Fig. Q3 (b) is 12 dB, the cable loss is 5 dB, the LNA gain is 50 dB and its noise temperature is 150 K. The antenna noise temperature is 35 K. Calculate the noise temperature referred to the input. **(05 Marks)**

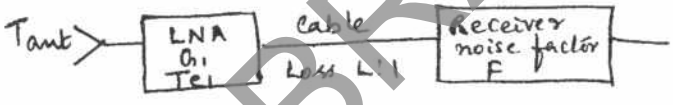

Fig. Q3 (b)

c. Explain combined uplink and downlink C/N ratio. **(07 Marks)**

4 a. Explain : i) the power supply subsystem ii) the thermal control subsystem. **(08 Marks)**

b. With the help of a neat diagram, explain the operation of a power amplifier of a transponder along with its transfer characteristics. **(12 Marks)**

PART – B

5 a. Explain the 'receive only' home TV system. **(13 Marks)**

b. Explain a MATV system, with a neat diagram. **(07 Marks)**

6 a. An FM/TV carrier is specified as having a modulation index of 2.571 and a top modulating frequency of 4.2 MHz. Calculate the protection ratio required to give a quality impairment factor of (i) 4.2 and (ii) 4.5. **(06 Marks)**

b. Explain possible interference nodes between satellite circuits and a terrestrial station. **(07 Marks)**

c. Explain spade system. **(07 Marks)**

7 a. Explain the following: i) Transponder capacity ii) Frequencies and polarization. **(08 Marks)**

b. Explain in detail the satellite mobile services. **(12 Marks)**

8 Write short notes on:

a. INTELSAT.

b. Radarsat.

c. Polar mount antenna.

d. Iridium. **(20 Marks)**

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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06EC667

Sixth Semester B.E. Degree Examination, December 2010
Digital Systems Design using VHDL

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Differentiate between signal assignment and variable assignment, with a suitable example. **(06 Marks)**

b. Write the structural VHDL code for a 4-bit subtracter, starting from a single bit full subtracter as a component. **(07 Marks)**

c. List the VHDL operators, with examples. **(07 Marks)**

2 a. Implement the given state table using ROM and D-flip flop. Draw the block diagram and write the VHDL code that describes the system. **(08 Marks)**

Q_1	Q_2	Q_1^+ X = 0	Q_2^+ X = 1	Z X= 0	Z X = 1
0	0	01	10	0	1
0	1	10	00	1	1
1	0	00	01	1	1

b. Differentiate between PAL and PLA. **(04 Marks)**

c. Find a minimum row PLA table to implement the following sets of function:

$f_1(A, B, C, D) = \Sigma m(4, 5, 10, 11, 12)$

$f_2(A, B, C, D) = \Sigma m(0, 1, 3, 4, 8, 11)$

$f_3(A, B, C, D) = \Sigma m(0, 4, 10, 12, 14)$ **(08 Marks)**

3 a. With the block diagram approach, explain the operation of serial adder, with accumulator. **(10 Marks)**

b. Design and implement a two 4-bit unsigned number, using VHDL code of multiplier. **(10 Marks)**

4 a. Draw a block diagram and SM chart for a divider, that divides a 8-bit divident by a 5-bit divisor to give a 3-bit quotient. The divident register should be loaded with st = 1. **(10 Marks)**

b. Write a VHDL description for a 4-bit binary multiplier for the SM chart, shown in Fig.Q4(b) below: **(10 Marks)**

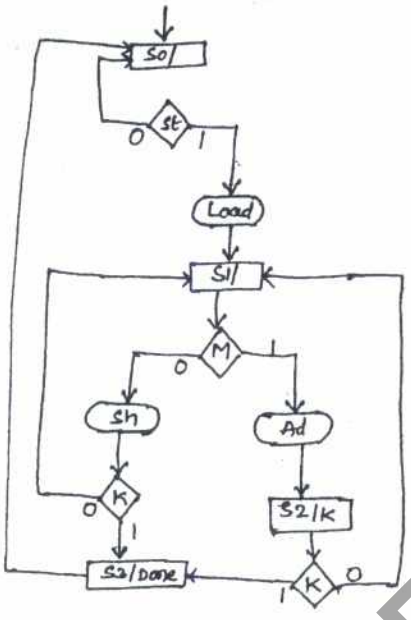

Fig.Q4(b)

PART – B

5 a. Write a VHDL code using one hot assignment for the following specifications:

$T_0 : Q_0 Q_1 Q_2 Q_3 = 1000$; $T_1 = 0100$; $T_2 = 0010$; $T_3 = 0001$

$Q_3^+ = X_1Q_0 + X_2Q_1 + X_3Q_2 + X_4Q_3$

$Z_1 = X_1Q_0 + X_3Q_2$

$Z_2 = X_1Q_1 + X_4Q_3$ **(10 Marks)**

b. With the help of a block diagram, explain the Xilinx 3000 series configurable logic block. **(10 Marks)**

6 a. Give the necessary steps to carry out the floating point addition. **(06 Marks)**

b. Draw a flow chart for floating point multiplication. **(07 Marks)**

c. Draw a flow chart for floating point divider. **(07 Marks)**

7 a. Compare transport delay and inertial delay. **(06 Marks)**

b. Write a VHDL code for a tristate buffer, with active high o/p enable. [Refer Fig.Q7(b)]

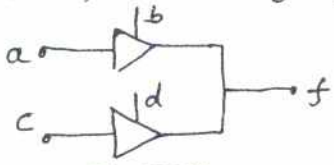

Fig.Q7(b) **(07 Marks)**

c. Write a VHDL code and synthesized circuit for a case statement. **(07 Marks)**

8 a. Draw the block diagram and SM chart for a RAM system. **(10 Marks)**

b. Draw the simplified 486 bus interface unit and SM chart for the same. **(10 Marks)**

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