Hall Ticket Number :										

R14

Code: 4PC314

M.Tech. I Semester Regular & Supplementary Examinations Feb/Mar 2016

Modelling & Synthesis through Verilog HDL

(*Common to DECS & VLSISD*)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

****

UNIT-I

1. Explain about various Data types available in Verilog 12M

OR

2. Explain about various Operators available in Verilog. 12M

UNIT-II

3. Explain about Models of Propagation Delays in Verilog. 12M

OR

4. Explain about Inertial Delay and Transport Delay in Verilog. 12M

UNIT-III

5. Explain about Procedural Timing Control and Synchronization. 12M

OR

6. Explain about Constructs for Activity Flow Control in Verilog. 12M

UNIT-IV

7. Explain about HDL-based Synthesis of Combinational Logic in Verilog. 12M

OR

8. Explain about Synthesis of Finite State Machine (FSM) in Verilog. 12M

UNIT-V

9. Explain about Synthesis of Expressions and Operators for language constructs. 12M

OR

10. Explain about Synthesis of Assignments for language constructs 12M

***

Hall Ticket Number :										

R14

Code: 4PA312

M.Tech. I Semester Regular & Supplementary Examinations Feb/Mar 2016

Advanced Digital Signal Processing

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

****

UNIT-I

1. a) Discuss in Detail about the Sampling Rate Alteration devices 6M
   b) Explain the classification of LTI Discrete Time systems in Detail 6M

OR

2. Discuss
   i. Operations performed on sequence
   ii. Energy Density spectrum of a discrete time sequence 12M

UNIT-II

3. a) Explain the digital sine-cosine Generator? 12M
   b) Explain the types of Linear-phase FIR Transfer Functions?

OR

4. Discuss in detail least square Design Methods with example 12M

UNIT-III

5. Explain the Computation of DFT approach for Linear Filtering using Chirp Z-transform 12M

OR

6. a) Compute Split Radix FFT algorithms. 6M
   b) Explain about DFT computation over a narrow frequency band 6M

UNIT-IV

7. Explain the following parametric methods to measure be spectrum of long duration signals
   i) ARMA model-
   ii) MA model- 12M

OR

8. a) Explain how power spectrum can be estimated from the AR model 6M
   b) Discuss the Welch method of Periodogram averaging 6M

UNIT-V

9. Distinguish between interpolation and Decimation and analyze the rate converter with a rational factor of I/D. Hence discuss the role of low pass filter on Multirate signal conversion 12M

OR

10. a) Explain the application of multirate signal processing in adaptive sub-band coding system 6M
    b) Describe the mathematical equations how sampling rate can be increased by a factor of L 6M

***

Hall Ticket Number :										

R14

Code: 4PA313

M.Tech. I Semester Regular & Supplementary Examinations Feb/Mar 2016

Digital Communication Techniques

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

****

UNIT-I

1. a) Discuss about complex envelop representation of band pass signals. 5M

   b) Derive suitable expression for response of band pass system to band pass signal. 7M

OR

2 By applying Gram-Schmidt procedure determine the orthonormal basis functions for four signals given below

$$s_1(t) = 1 \quad for \quad 0 \le t \le 2, \qquad = 0 \quad otherwise$$

$$s_2(t) = 1 \quad for \quad 0 \le t \le 1, \qquad = -1 \quad 1 \le t \le 2, \qquad = 0 \quad otherwise$$

$$s_3(t) = 1 \quad for \quad 0 \le t \le 2,$$

$$s_4(t) = -1 \quad for \quad 0 \le t \le 3, \qquad = -1 \quad 2 \le t \le 3, \qquad = 0 \quad otherwise$$

$$= 0 \quad otherwise$$

12M

UNIT-II

3. Discuss the working mechanism of optimum detector and realize optimum AWGN receiver. What are the merits and demerits comparing with matched receiver? 12M

OR

4. A binary digital communication system employs the signals

$$S_0(t) = 0 \qquad 0 \le t \le T$$

$$S_1(t) = A \qquad 0 \le t \le T$$

For transmitting the information. This is called on-off signaling. The demodulator cross-correlates the received signal r(t) with s(t) and samples the output of the correlator at t+T.

a) Determine the optimum detector for an AWGN channel and
b) the optimum threshold
c) Determine the probability of error as a function of the SNR.

assuming that the signals are equally probable. 12M

UNIT-III

5. a) Explain Diversity techniques for fading multipath channels. 6M

   b) Describe the characterization of fading multipath channels. 6M

OR

6. Briefly describe receiver structures for channels with Inter symbol Interference.

UNIT-IV

7. With a neat sketch, explain optimum receiver for channels with ISI and AWGN. 12M

OR

8. Explain the signal Design for band limited channel 12M

UNIT-V

9. a) Briefly describe suppression of ICI in OFDM system. 5M

   b) Derive the expression for capacity of fading channels. 7M

OR

10. Explain in detail about Filter bank implementation of OFDM receiver with neat sketches. 12M

***

Hall Ticket Number :										

R14

Code: 4PA314

M.Tech. I Semester Regular & Supplementary Examinations Feb/Mar 2016

Wireless Communications

(DECS)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

****

UNIT-I

1. a) Discuss the evolution of mobile radio communication 6M
   b) Explain the basis for classification of 1G,2G,3G and 4G networks 6M

OR

2. a) Explain LMP,L2CAP and SDP Protocols with respect to Bluetooth 6M
   b) Discuss the advantages of wireless LAN 6M

UNIT-II

3. a) Explain the free-space propagation model 6M
   b) Discuss the two-ray model of ground-reflection 6M

OR

4. a) Define fading and discuss types 6M
   b) Explain the impulse-response model of a multipath channel 6M

UNIT-III

5. a) Describe the set-ups for frequency and polarization Diversity and explain 6M
   b) Draw the block schematic of Rake receiver and explain the working 6M

OR

6. a) Compare DS and FH spread-spectrum systems 6M
   b) Discuss the properties of PN sequences 6M

UNIT-IV

7. a) Explain TDMA frame structure and its efficiency 6M
   b) Draw the set-up for space-division multiple access and explain 6M

OR

8. a) Explain the capacity aspects of CDMA and SDMA 6M
   b) Discuss the SPADE system 6M

UNIT-V

9. a) Discuss the capacity of flat-fading channels 6M
   b) Explain the model of a MIMO system 6M

OR

10. a) Derive the expression for maximum capacity of MIMO system , if there is no Channel state information 6M
    b) Discuss the capacity of frequency selective fading channels 6M

***

Hall Ticket Number :										

R14

Code: 4PA311

M.Tech. I Semester Regular & Supplementary Examinations Feb/Mar 2016

Digital System Design

(D E C S)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

****

UNIT–I

1. a) Develop an ASM chart of D flip flop and realize it using only NOR Gates. 6M

   b) Discuss in detail about reduction of state tables and state assignments. 6M

OR

2. a) What are the basic elements of an ASM chart? Explain clearly with an example. 6M

   b) Draw the ASM chart to detect the overlapping sequence 1010 from the incoming bit stream and output 1 for each detection.
   Ex: x: 10101010110- - - -.
   Z: 00010101000- - -.
   Implement the controller circuit using MUX method. 6M

UNIT–II

3. a) Explain about the following types of faults:
   (i) stuck at faults (ii) Bridge faults (iii) transition and intermittent faults 6M

   b) Explain how Kohavi algorithm is useful in the detection of faults in digital circuits. 6M

OR

4. a) With an example, explain the principle of operation of path sensitizations method 6M

   b) Write a D Algorithm and compare it with other test pattern generation methods. 6M

UNIT–III

5. a) Explain briefly about the Distinguishing Experiment with an example. 6M

   b) Explain the concept of Machine identification with an example 6M

OR

6. Write note on State identification and fault detection experiment 12M

UNIT–IV

7. a) Find minimized PLA of the following multiple output Boolean functions on a map. Calculate the area and cross point densities of the un-minimized and minimized PLAs.

   $f_1 = \sum (2,4,5,6,7,10,14,15)$

   $f_2 = \sum (4,5,7,11,15)$ 6M

   b) Apply PLA maximization procedure and obtain the minimized expression to be implemented on PLA. For

   F = 2021+0022+1200 6M

OR

8. a) With examples, explain in detail about various types of cross point fault that occur in PLAs. 6M

   b) With an example, explain how test generation can be achieved in testing a PLA. 6M

UNIT–V

9. a) Explain the conversion between Mealy and Moore models with examples. 6M

   b) Explain briefly about races and cycles in digital circuits. 6M

OR

10. a) Explain briefly, the occurrence of various types of hazards in digital circuits. 6M

    b) Implement a hazard free circuit for the following function:

    f (ABCD) = A'BC' + A'B'C+ CD'+AC 6M

***

Hall Ticket Number :										

R14

Code: 4PB311

M.Tech. I Semester Regular & Supplementary Examinations Feb/Mar 2016

Embedded System Concepts

(Common to DECS, Embedded Systems, VLSISD)

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

****

UNIT-I

1. Discuss the following in details
   i) Characteristics and constraints of embedded systems
   ii) Classifications of embedded systems 12M

OR

2. Explain about significance of each hardware unit present in embedded design 12M

UNIT-II

3. a) Compare Harvard and Princeton memory organizations. 4M
   b) Why should a program be divided into functions (routines or modules) and each placed in different memory blocks or segments 8M

OR

4. What are the different memories, input and output devices used In embedded systems? How will you interface these input and output devices in embedded systems 12M

UNIT-III

5. What is meant by scheduling? How do schedule the tasks with different algorithms 12M

OR

6. Explain about different buses used in parallel communication between networked devices 12M

UNIT-IV

7. What is meant by co-design? Explain design & co-design issues in system development process 12M

OR

8. Discuss different design methodologies for embedded system. 12M

UNIT-V

9. Describe the classes, the objects which are used in writing codes for saving an image file in a digital camera? 12M

OR

10. How do you design an automatic chocolate vending machine? Explain clearly. 12M

***