Code No. 6272 / O

FACULTY OF ENGINEERING B.E. 4/4 (ECE) II - Semester (Old) Examination, May 2014

Subject : Design of Fault Tolerant Systems (Elective-II)

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B. PART – A (25 Marks)

1	Distinguish between FAULT detection and fault location.	(3)								
2	Distinguish between static and dynamic hazard redundancy techniques.									
3	Discuss about delay models.									
4	What is Fault sampling? Given an example.									
5	What is the need for self checking circuits?	(2)								
6	Define Software redundancy.									
7	What is meant by Reliability improvement factor for a system?									
8	What is meant by circular BIST technique?	(3)								
9	List out advantages and disadvantages of LSSD Technique.	(3)								
10	Define Reliability and controllability.	(2)								
	PART – B (50 Marks)									
11	 (a) With neat diagrams discuss about reliability of series and parallel systems. (b) Discuss about memory test architectures and techniques. 	(5) (5)								
12	(a) Explain the different modeling scheme of faults that generally come across in digital circuits	(5)								
	 (b) Explain the following terms with respect to digital circuits (i) Fault diagnosis (ii) Fault detection test set 	(5) (5)								
13	(a) Construct a seven bit error correcting code to represent the decimal digit by									
10	augment the Excess-3code by using add-1 parity check.	(7)								
	(b) Design a redundant circuit for $f = ab$.	(3)								
		()								
14	(a) Explain the advantages of PLA and how it is used self checking circuits.									
	out of 5 code.									
		(•)								
15	 (a) What are the goals of a design for testability? (b) What are the different DET method available? Explain at least two such technique. 									
40	(a) Listlevel consitive coor desire rules and combine	(5)								
10	(a) List level sensitive scan design rules and explain.									
17	Write short notes on the following									
17	(a) STUMPS (b) CE BS (c) CSTP (d) BILBO									

Code No. 6531 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II - Semester (New) (Main) Examination, May 2014

Subject : Design of Fault Tolerant Systems (Elective – II)

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B. PART – A (25 Marks)

- 1 Relater MTBF and Reliability.
- 2 What are temporary faults and how can they be modeled?
- 3 What techniques are used for fault detection in individual modules of a dynamic system?
- 4 What is self purging redundancy?
- 5 Draw the block diagram of FTBBC's self checking computer module.
- 6 Differentiate between time and modular redundancy.
- 7 What is a cross point fault?
- 8 What is fail-safe design?
- 9 Show that adding controlling and observing nodes improvers test ability of a circuit.
- 10 List the advantages of using unordered codes in error detection.

PART – B (50 Marks)

11 a) Explain one dimensional path sensitization in detail and find a test set for the fault S_3 s-a-1 in the following circuit.



- b) Explain signature analysis in brief.
- 12 a) Explain sift-out modular redundancy with a suitable example in detail.
 - b) Explain Tripple-modular redundancy in detail and derive an expression for its reliability.
- 13 Explain any two practical fault Lourent systems in detail.
- 14 Write the procedure to design check bit generator circuit for a totally self checking checker for Berger code.
- 15 Explain reed Muller expansion techniques in detail with a suitable example.
- 16 a) Explain test generation procedure for combinational logic circuits using translation count technique.
 - b) Explain briefly about self checking PLA design.
- 17 Write short notes on :
 - a) Boolean difference method b) Fault secure circuits
 - c) Partially self checking circuits

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Code No. 6279 / O

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (Old) Examination, May 2014

Subject: Micro Electro Mechanical Systems (Elective – II)

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B. PART – A (25 Marks)

- 1 List the applications of bimetallic switches.
- 2 Define the magnetic switches and reed.
- 3 Define bending moment.
- 4 Define the mechanical behaviour of thin films.
- 5 Define electric flux and flux density.
- 6 Define fringe fields.
- 7 Define switch gate RFMEMS
- 8 Define coumb capacitor
- 9 Define lithography
- 10 List the limitations of MEM devices.

PART – B (50 Marks)

- 11 Explain in detail about shape memory alloy based switches with neat diagram.
- 12 Explain the quantitative description of vibrational characteristics of bending of square and circular plates.
- 13 Explain the deflectron curves for cantilevers of single and fixed ends.
- 14 Explain in detail the analysis of parallel plate system one fixed and the other held by a spring.
- 15 Explain the MEM gates as AND, XOR in detail, using examples.
- 16 Explain in detail the properties of MEM materials with examples.
- 17 Write the short notes on:
 - a) Electrostatic actuators
 - b) Variable capacitor
 - c) MEM Technology

Code No. 6534 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (New) (Main) Examination, May 2014

Subject : Entrepreneurship (Elective – II)

Time: 3 hours

Max. Marks: 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B. PART – A (25 Marks)

- 1 Who is an entrepreneur?
- 1 Write few lines about marketing analysis in project formulation. 2 2 3 List out the areas where linkage is required between small and large scale industries. 3 3 What are the problems that are faced by women entrepreneur? 4 3 5 What is an idea? List out different sources of ideas. 3 Define project. Mention few objectives of project management. 6 3 7 List out various sources in raising finance in Indian context. 3 8 What are the basic differences between PERT and CPM? 2 Explain briefly about assessing tax burden. 9 2 10 Write few lines about sole proprietorship.

PART – B $(5 \times 10 = 50 \text{ Marks})$

- Define economy of a nation, and explain different factors which influence economical status 11 a) of a nation.
 - Discuss about various forms of enterprises. b)
- 12 a) What are the special attributes of first generation entrepreneurs?
 - Explain about opportunities for women entrepreneur in Indian context. b)
- 13 Discuss about the concept and role of network diagrams in project management. Draw the network diagram and show the critical path for given time estimates as shown in the following table. Also calculate the event slacks.

Activity	Three time estimates							
Activity	to	t _m	t _p					
1 – 2	09	12	21					
1 – 3	06	12	18					
2 – 4	01	1.5	05					
3 – 4	04	8.5	10					
2 – 5	10	14	24					
4 – 5	01	02	03					

- Write about human aspects of project management. 14 a)
- Write about choice of technology with suitable examples. b)
- 15 a) Discuss about the influence of leadership capabilities in success of an entrepreneur.
- Explain in detail about change behaviour with examples. b)
- List out various approaches of time management and explain any two of them. 16 a)
 - What are the various personality determinants? Discuss about their influence in b) success of entrepreneur.
- 17 Write short notes on any **Three** of the following :
 - Environmental influence in Entrepreneurship ii) Urgency addiction i)
 - iii) Collaborative interaction for technology development
 - iv) Business plan / project report Leadership models V)

Code No. 6529 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (New) (Main) Examination, May 2014

Subject : Real Time Operating Systems (Elective - II)

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B. PART – A (25 Marks)

- 1 Describe the structure of an OS with a diagram.
- 2 How did the OS evolve?
- 3 What is message passing ?
- 4 What is thrashing?
- 5 How are semaphores addressed in ucos?
- 6 Explain Round Robin scheduling, with an example.
- 7 Explain about demand paging.
- 8 Explain deadlock prevention.
- 9 Explain briefly SJF.
- 10 Differentiate multitasking and multiuser OS,

PART – B (50 Marks)

- 11 a) Distinguish between the types of operating systems available.
 - b) Describe the Microkernel structure.
- 12 What is scheduling? Describe the various types of scheduling clearly.
- 13 a) How is a real time scheduling different from the desktop scheduling?b) What is a Mutex? How does it address the shared data problem?
- 14 a) Explain the principles of concurrency.
 - b) Describe the producer consumer problem.
- 15 a) Consider a swapping system in which memory consists of the following hole sizes in memory order : 10K, 4K, 20K, 18K, 7K, 9K, 12K and 15K. Which hole is taken for successive segment requests of i) 12K ii) 10K iii) 9K for first fit? Now repeat the question for best fit, worst fit and next fit.
 - b) What is Disk scheduling?
- 16 Describe a case study of a real time operating system.
- 17 Write note on :
 - a) Virtual memory
 - b) Deadlock

Code No. 6530 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (New) (Main) Examination, May 2014

Subject : Coding Theory and Techniques (Elective – II)

Time : 3 hours

Max. Marks : 75

2

3

2

3 2

3

2

3

2

3

5

5

4

6

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B. PART – A (25 Marks)

- 1 What are the various transmission errors of a digital communication system?
- 2 What is Shanon-Fano coding? Explain in brief.
- 3 Define channel coding gain.
- 4 What are product codes? Describe in brief.
- 5 Define constraint length of a convolutional code.
- 6 Construct encoder for a convolutional code with the following impulse responses. $g_1=[1 \ 0 \ 1]$; $g_2 = [1 \ 1 \ 1]$
- 7 Mention the regularity constraints in constructing the parity check matrix of LDPC code.
- 8 Draw the Tanner graph of a (10, 3, 5) LDPC code.
- 9 What is the error correcting capability of an (n, k) RS code?
- 10 Define primitive polynomial over Galois field and give an example.

PART – B (50 Marks)

- 11 i) Explain maximum likelihood decoding.
 - ii) Describe Huffman codes.
- 12 i) Define Reed-Muller codes and give an example for first order Reed Muller code of length 8.
 - ii) Decode the following received vector using arithmetic decoding algorithm for Golay codes. r = (0011 1101 0000 0011 0000 1010)

13



If a code word from the above encoder is transmitted over aBCC and the received sequence is r = (110, 110, 110, 111, 010). Find the maximum likelihood codeword using Viterci Hard decision decoding algorithm.

-

10

- 2 -

14	Cor	nstruct gen	erat	or n	natr	ix G	6 for	LD	PC	cod	le w	vith the following parity check matrix A.	10
			[1	1	0	0	1	1	1	1	0	0]	
			1	0	1	1	0	1	0	1	0	1	
		A =	0	1	0	1	1	0	0	1	1	1	
			1	0	1	0	1	0	1	0	1	1	
			0	1	1	1	0	1	1	0	1	0	
15	 i) State basic properties of Galois fields. ii) Construct a Galois field GF(8). 											4 6	
16	Describe LDPC codes decoding algorithm. 10												
17	 i) State structural properties of convolutional codes. ii) Construct a syndrome decoding table for a (7, 4) Hamming code. 										4 6		
									*	***	**		

Code No. 6533 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (New) (Main) Examination, May 2014

Subject : Wireless Sensor Networks (Elective – II)

Time : 3 hours

Max. Marks: 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B. PART – A (25 Marks)

1 2 4 5 6 7 8 9 10	Give the historical background of sensor networks. Discuss challenges and hurdles of wireless sensor networks. What are the various applications of wireless sensor networks? What are performance requirements of MAC protocols for wireless sensor networks? Explain briefly mobile IP. Explain localization of sensor nodes in WSNs. What are design factors for a routing protocol of WSNs? What are programming challenges for sensor network software tools? Explain simulator for wireless sensor network. Bring out differences between adhoc networks and wireless sensor networks.								
	PART – B (50 Marks)								
11	a) b)	Explain hardware components of a typical sensing node. Explain smart home environment.	10						
12	a) b)	Explain different network models of WSNS. Bring out differences between zigbee and Bluetooth.	10						
13	a) b)	Discuss in detail about IEEE 802.15.14 PHY layer main parameters. Explain sensor network-specific MAC protocol (S-MAC).	10						
14	a) b)	Explain the idea of information based sensor tasking. Discuss the 'range assignment problem' in topology control.	10						
15	a) b)	Explain simulator TOSSIM for Tinyos applications. Explain information driven sensor quering (IDSQ) algorithm.	10						
16	a)	What do you mean by state centric programming and explain its significance over generic distributed programs.							
	b)	Explain how multi-target tracking problem is solved using state-centric programming.	10						
17	Wri a) b)	te short notes on : GEAR protocol Unslotted CSMA algorithm	10						

b) Unslotted CSMA algorithm

Code No. 6273 / O

FACULTY OF ENGINEERING B.E. 4/4 (ECE) II - Semester (Old) Examination, May 2014

Subject : Global Positioning System (Elective-II)

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part - B. PART – A (25 Marks)

1	List the six Keplesian elements.	(2)
2	What do you mean by multipath error?	(2)
3	Explain geodetic latitude, geodetic longitude and geodetic height.	(3)
4	Distinguish WAAS and LASS.	(2)
5	Why L-band is selected for GPS?	(3)
6	Compare GPS and Galileo constellations.	(3)
7	What is need of augmentation?	(2)
8	Explain briefly integration of GPS and pseudolile.	(3)
9	List various errors in GPS.	(2)
10	Describe briefly ECEF coordinate system.	(3)

PART – B (50 Marks)

11	(a) Explain the basic principle and operation of GPS and architecture with suitable	
	diagrams.	(6)
	(b) Discuss about various types DOPs.	(4)
12	(a) Discuss in detail about the satellite and receiver clock errors.	(6)
	(b) Explain about WGS-84 co-ordinate system used in GPS.	(4)
		(0)
13	(a) Describe GPS observation and navigation data formats.	(6)
	(b) Discuss the GPS signal structure using necessary diagrams.	(4)
	(a) Describe and a stand environment DODO to sharing a	(5)
14	(a) Describe code abased and carrier based DGPS techniques.	(5)
	(b) Explain briefly about DGPS errors, GAGAN.	(5)
15	(a) Compare GPS, GLONASS and Galileo constellations	(5)
10	(b) Discuss about integration of GPS / cellular bring out its advantages	(5)
	(b) Discuss about integration of or or central bring out to devantages.	(0)
16	(a) Derive the relation for ionospheric time delay in terms of TEC.	(5)
-	(b) Discuss about various applications of GPS.	(5)
	(c)	(-)
17	Write short notes on the following:	(10)
	(a) GPS time	
	(b) LIERE	

(b) UERE (c) GIS

Code No. 6270 / O

FACULTY OF ENGINEERING B.E. 4/4 (ECE) II - Semester (Old) Examination, May 2014

Subject : Neural Networks and Fuzzy Logic (Elective – II)

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part - B. PART – A (25 Marks)

- 1 What is the physical significance of "Adder" employed in modeling a neuron?
- 2 With the help of a neat sketch, explain ADALINE network.
- 3 Differentiate between neural network memories and conventional memories.
- 4 State Hebb's postulate of learning.
- 5 Draw the structure of Hopfield auto associative memory.
- 6 Explain in brief, the application of neural networks in pattern recognition.
- 7 Give an example for a normalized fuzzy set.
- 8 List five areas of possible application of fuzzy logic.
- 9 Explain the importance of fuzzy sets in real world.
- 10 What are fuzzy measures?

PART – B (50 Marks)

- 11 With the help of a neat sketch, explain the back propagation learning algorithm.
- 12 Write a detailed note on neural networks classification.
- 13 Explain about the different architectures of recurrent neural networks and the corresponding training algorithms.
- 14 With the help of block diagram, describe system identification using RNN.
- 15 (a) Using DeMorgan's laws, determine the S-norm corresponding to the T-norm : min(x, y).
 - (b) Prove that the "minimum" operator is the largest T-norm and the "maximum" operator is the smallest S-norm.
- 16 What are fuzzy relations? Explain the operations on fuzzy relations.
- 17 Write short notes on the following:
 - (a) Representation theorem
 - (b) Main steps of fuzzy logic control
 - (c) Application of neural networks in process control