15EC51

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC/TC/EI/BM/ML

Course: 15EC51 - Management and Entrepreneurship Development

Time: 3 hours **Max. Marks: 80**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Module-1

1 a. Define management. Explain various functions of managers. (08 Marks)
b. Explain various Roles of managers. (08 Marks)

Or

2 a. Define planning. Compare Strategic plans with tactical plans. (05 Marks)
b. what is rational decisions? Explain the steps involved in rational decision making. (07 Marks)
c. Explain various types of decisions. (04 Marks)

Module-2

3 a. Explain the process of organizing. (08 Marks)
b. Explain Nature and importance of staffing (04 Marks)
c. Explain the process of Recruitment. (04 Marks)

Or

4 a. What is meaning of direction. Explain steps involved in controlling. (08 marks)
b. Define Leadership. Explain briefly any two leadership styles. (08 marks)

Module-3

5 a. Explain Social audit. (06 Marks)
b. Explain Business Ethics and Corporate Governance (06 Marks)
c. Who is an Entrepreneur? Explain the characteristics of an Entrepreneur. (06 Marks)

Or

6 a. Explain various classification of Entrepreneurs. (08 marks)
b. Explain problems faced by Entrepreneurs. (08 marks)

Module-4

7 a. Explain the role of Small scale industries in economic development. (06 marks)
b. Explain the impact of WTO on small scale industries. (04 marks)
c. Explain briefly the sickness in SSI sector (06 Marks)

Or

8 a. Explain any two Policies & Schemes of Central–Level Institutions. (08 Marks)
b. Explain any two Policies & Schemes of State–Level Institutions. (08 Marks)

Module-5

9 a. Explain product planning and Development process. (08 Marks)
b. Explain Project Feasibility Analysis. (08 Marks)

Or

10 a. Explain the characteristics of a project. (04 Marks)
b, Explain steps involved in PERT and CPM with advantages and limitations. (12 marks)

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15EC52

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC/TC

Course: 15EC52 - Digital Signal processing

Time: 3 Hours **Max Marks: 80**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Module 1			
1	(a)	Explain the frequency domain sampling and reconstruction of discrete time signals.	8
	(b)	The first five points of the eight point DFT of a real valued sequence are {0.25, 0.125-j0.3018, 0, 0.125-j0.0518, 0}. Determine the remaining three points.	3
	(c)	Determine the circular convolution of the sequences, x1(n) = {1,2,3,1}, x2(n)={4,3,2,2} using time domain approach.	5
OR			
2	(a)	Obtain the relationship of DFT with the Z-transform.	5
	(b)	Show that the multiplication of two DFTs leads to circular convolution of respective time sequences.	7
	(c)	Consider a finite duration sequence x(n) = {0,1,2,3,4}. (i) Determine the sequence y(n) with six point DFT Y(k) = Real[X(k)] (ii) Determine the sequence v(n) with six point DFT V(k) = Imaginary[X(k)]	4
Module 2			
3	(a)	Explain the linear filtering of long data sequences using overlap-save method.	6
	(b)	The 4-point DFT of a real sequence x(n) is X(k) = (1, j, 1, -j). Find the DFTs of the following. i) $x_1(n) = (-1)^n x(n)$, ii) ii) $x_2(n)=x((n+1))_4$, iii) iii) $x_3(n) = x(4-n)$	6
	(c)	Explain the computational complexity of direct computation of DFT. What are the efficient algorithms for the evaluation of the DFT?	4
OR			
4	(a)	Find the response of an LTI system with an impulse response h(n) = (3,2,1) for the input x(n) = (2, -1, -1, -2, -3, 5,6,-1, 2,0,2,1) using overlap and add method. Use 8 point circular convolution.	7
	(b)	The 5-p0int DFT of a complex sequence x(n) is X(k)=(j, 1+j, 1+j2, 4+j). Compute Y(k), if y(n)=x*(n).	4
	(c)	State and prove the property of circular time shift of a sequence.	5
Module 3			

5	(a)	Derive the radix-2 decimation in time FFT algorithm and draw the signal flow graph for eight point DFT computation.	8
	(b)	Find the number of complex additions and complex multiplications required for 128-point DFT computation using i) Direct method, ii) FFT method. What is the speed improvement factor?	3
	(c)	Find the 4-point real sequence x(n), if its DFT samples are X(0)=6, X(1)=-2+j2, X(2)=-2. Use DIF-FFT algorithm.	5
OR			
6	(a)	Compute the eight point DFT of the sequence x(n) = { ½, ½, ½, ½, 0,0,0,0} using the inplace radix-2 decimation in frequency FFT algorithm.	8
	(b)	Explain the Goertzel algorithm and obtain the direct form II realization.	8
Module 4			
7	(a)	Obtain the cascade realization for a system described by H(z) = $\frac{1+\frac{1}{4}z^{-1}}{\left(1+\frac{1}{2}z^{-1}\right)\left(1+\frac{1}{2}z^{-1}+\frac{1}{4}z^{-2}\right)}$.	5
	(b)	Explain the design of IIR filter by Impulse invariance technique.	6
	(c)	Determine the order and cut off frequency of Butterworth analog highpass filter to meet the specifications: Maximum passband attenuation = 2 dB, Minimum stop band attenuation = 20 dB, Passband edge frequency = 200 rad/sec, stopband edge frequency = 100 rad/sec.	5
OR			
8	(a)	Obtain the parallel realization of the system function H(z) = $\frac{(1+z^{-1})(1+2z^{-1})}{\left(1+\frac{1}{2}z^{-1}\right)\left(1-\frac{1}{2}z^{-1}\right)(1+\frac{1}{8}z^{-1})}$	6
	(b)	Design a digital low pas Butterworth filter using bilinear transformation to meet the specifications: i) -3 dB cut-off frequency at 0.5 π rad, ii) -15 dB at 0.75π rad. Obtain H(Z) assuming T=1 sec.	6
	(c)	What are the characteristics of Chebyshev filters? Define its magnitude response and list the properties of polynomial for type I Chebyshev filters.	4
Module 5			
9	(a)	Realize the linear phase FIR filter for the impulse response h(n)= δ(n)+ ¼ δ(n-1)- ½δ(n-1)+ ¼ δ(n-3)+ δ(n-4) using direct form.	3
	(b)	Describe the frequency sampling realization of FIR filter.	7
	(c)	Determine the filter coefficients of an FIR filter for the desired frequency response $H_d(\omega)=\begin{cases} e^{-j2\omega}, \lvert\omega\rvert < \frac{\pi}{4} \\ 0, \quad \frac{\pi}{4} < \lvert\omega\rvert \geq \pi \end{cases}$ Use rectangular window function. Find the frequency response H(ω) of the filter.	6
OR			
10	(a)	Consider an FIR lattice filter with coefficients K1=0.65, K2=-0.34 and K3=0.8. Find its impulse response and draw the direct form structure.	7
	(b)	Determine the impulse response of an FIR filter to meet the specifications: Passband edge frequency of 1.5 KHz, Stopband edge frequency of 2 KHz, Sampling frequency of 8 KHz. Use the Hamming window function.	6
	(c)	Compare the different window functions used in FIR filter design.	3

15EC53

Visvesvaraya Technological University, Belagavi

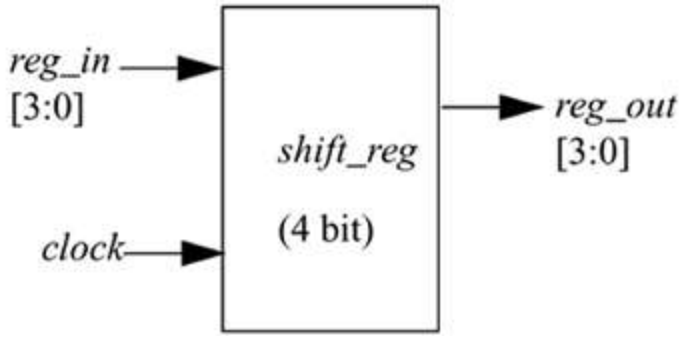
MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC

Course: 15EC53 - Verilog HDL

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Time: 3 Hrs **Max. Marks: 80**

		Module-1	
1	a.	Explain a typical design flow for designing VLSI IC circuits using the block diagram.	08
	b.	Explain the different levels of Abstraction used for programming in Verilog.	08
		OR	
2	a.	Explain a top-down design methodology and a bottom-up design methodology.	10
	b.	Explain the factors that have made Verilog HDL popular.	06
		Module-2	
3	a.	Write a note on i) Comments ii) Number Specification iii) X and Z values and iv) Identifiers and Keywords with suitable examples.	10
	b.	Explain a Components of a Verilog Module with a neat block diagram.	06
		OR	
4	a.	Explain $display and $monitor tasks with examples.	10
	b.	A 4-bit parallel shift register has I/O pins as shown in the figure below. Write the module definition for this shift register. Include the list of ports and port declarations (no need to show the internals). 	06
		Module-3	
5	a.	Explain the instantiation of gates by writing a gate level module by name *gates* in Verilog.	04

	b.	Explain regular assignment delay in dataflow level of abstraction in Verilog.	04
	c.	The input output expressions for 1-bit Full Adder are given as sum= a ^ b^ c; co= (a &b)|(b&c)|(c&a). Write the gate level abstraction of 1-bit Full Adder by instantiating and, or, xor gates only.	08
		OR	
6	a.	Write the Verilog description of 4-bit Ripple carry Adder at Gate level Abstraction.	08
	b.	Write a program for 4-to-1 Multiplexer, Using Conditional Operators in dataflow level of abstraction in Verilog.	08
		Module-4	
7	a.	Explain combined port declaration and combined ANSI C style port declaration with examples in Verilog.	04
	b.	Explain the conditional statements in Verilog.	04
	c.	Write a behavioral 4 bit counter program in Verilog.	08
		OR	
8	a.	Explain different Loop statements in Verilog.	08
	b.	Write a Verilog behavioral 4 to 1 Multiplexer program using CASE statement.	08
		Module-5	
9	a.	Explain the synthesis process with a block diagram.	08
	b.	Write the VHDL entity declaration of 4- bit Ripple Carry Adder with the help of lock diagram of 4- bit Ripple Carry adder.	08
		OR	
10	a.	Explain the relationship between a design entity and its entity declaration and architecture body in VHDL.	08
	b.	Explain the declaration of constant, variable and signal in VHDL with examples.	08

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Visvesvaraya Technological University, Belagavi
MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC/TC
Course: 15EC54 - Information Theory and Coding

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Time:3 Hrs **Max. Marks: 80**

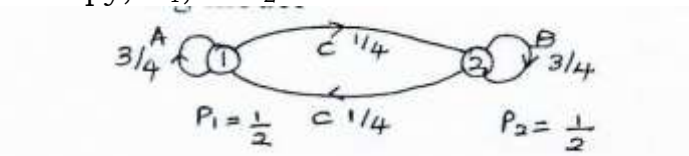
<table>
<tr><td colspan="4"><u>MODULE - 1</u></td></tr>
<tr><td>1</td><td>a.</td><td>Define Self Information, Entropy and Rate of Information</td><td>3</td></tr>
<tr><td></td><td>b.</td><td>A Binary Source produces symbols 0 and 1 with probability P and 1-P. Determine Entropy of the source. Sketch the variation of Entropy with P and comment on the result.</td><td>5</td></tr>
<tr><td></td><td>c.</td><td>Prove that Entropy function attains maximum value when the symbols are emitted with equal probability.</td><td>8</td></tr>
<tr><td colspan="4">OR</td></tr>
<tr><td>2</td><td>a.</td><td>For the Markov Source shown in Fig. Q 2.a., find the source Entropy, G_1, & G_2
 

Fig. Q 2.a.</td><td>12</td></tr>
<tr><td></td><td>b.</td><td>In a Facsimile picture transmission of pictures, there is about 3.25 M-pixels per frame. For a good reproduction, 15 brightness levels are necessary. Assuming that all the levels are equally likely to occur, find the rate of transmission if one picture is transmitted in every 3 minutes.</td><td>4</td></tr>
<tr><td colspan="4"><u>MODULE - 2</u></td></tr>
<tr><td>3</td><td>a.</td><td>Apply Shannon encoding algorithm and generate binary codes for the set of symbols given in table below. Also find efficiency.
<table>
<tr><td>Sym</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td></tr>
<tr><td>P</td><td>9/32</td><td>9/32</td><td>3/32</td><td>3/32</td><td>3/32</td><td>3/32</td><td>2/32</td></tr>
</table></td><td>8</td></tr>
<tr><td></td><td>b.</td><td>Using Shannon Fano Algorithm, encode the following set of symbols and find the efficiency:
<table>
<tr><td>Sym</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td></tr>
<tr><td>P</td><td>1/2</td><td>1/4</td><td>1/8</td><td>1/16</td><td>1/32</td><td>1/64</td><td>1/64</td></tr>
</table></td><td>5</td></tr>
<tr><td></td><td>c.</td><td>Write the decision tree for the following set of codes and check for KMI property.
<table>
<tr><td>A</td><td>1</td></tr>
<tr><td>B</td><td>10</td></tr>
<tr><td>C</td><td>110</td></tr>
<tr><td>D</td><td>1110</td></tr>
<tr><td>E</td><td>1111</td></tr>
</table></td><td>3</td></tr>
</table>

		OR	
4	a.	A discrete memory less source has an alphabet of seven symbols with probabilities as given below: Sym A B C D E F G P 0.25 0.25 0.125 0.125 0.125 0.0625 0.0625 Compute Huffman Code for the set of symbols shown above by moving combined symbols as high as possible and as low as possible. Find efficiency and variance.	8
	b.	Write a note on Arithmetic Coding	4
	c.	Design a ternary code for the set of symbols with probabilities as given below: Sym A B C D E F P 1/3 1/4 1/8 1/8 1/12 1/12	4
		MODULE - 3	
5	a.	The Joint probability matrix of a channel is given. Compute H(x), H(y), H(xy), H(x/y) and H(y/x) $P(xy) = \begin{bmatrix} 0.05 & 0 & 0.2 & 0.05 \\ 0 & 0.1 & 0.1 & 0 \\ 0 & 0 & 0.2 & 0.1 \\ 0.05 & 0.05 & 0 & 0.1 \end{bmatrix}$	05
	b.	A Binary Symmetric Channel has the following Joint probability matrix. Compute Mutual Information, Data transmission Rate and Channel Capacity if r_s = 100sym/sec $P(xy) = \begin{bmatrix} \frac{35}{72} & \frac{25}{72} \\ \frac{5}{72} & \frac{7}{72} \end{bmatrix}$	06
	c.	Derive an expression for the Data Transmission Rate of Binary Erasure Channel.	05
		OR	
6	a.	An analog source has a bandwidth of 4KHz. The signal is sampled at 2.5 times the Nyquist Rate and each sample is quantized into 256 equally likely levels. Assume that the successive samples are statistically independent. Find the information rate of the source. Can the output of this source be transmitted without error over an analog channel of Bandwidth 50Khz and S/N = 20db. If the output of the source is to be transmitted without error over an analog channel having S/N = 10, compute the bandwidth required.	06
	b.	Consider a Binary Symmetric Channel whose channel matrix is given by $P(y/x) = \begin{bmatrix} 0.7 & 0.3 \\ 0.4 & 0.6 \end{bmatrix}$. Find Channel Capacity.	05
	c.	Write a note on Differential Entropy	05
		MODULE - 4	

7	a.	Define Hamming Weight, Hamming Distance, Minimum Distance of Linear Block code and Systematic Linear Block Code	04
	b.	For a Linear Block Code the syndrome is given by: $S_1 = r_1 + r_2 + r_3 + r_5$, $S_2 = r_1 + r_2 + r_4 + r_6$, $S_3 = r_1 + r_3 + r_4 + r_7$ (i) Find Generator Matrix (ii) Find Parity Check Matrix (ii) Draw the Encoder and Decoder Circuit (iii) How many errors can be detected and corrected?	12
		OR	
8	a.	A (15,11) Cyclic Code is generated using $g(x) = 1+x+x^4$. Design an encoder and illustrate the encoding procedure with the message vector [11001101011] by listing the state of the register assuming the right most bit as the earliest bit.	08
	b.	A (7,4) Cyclic Code has the generator polynomial $g(x) = 1+x+x^4$. Write the syndrome calculation circuit and verify the circuit for the message polynomial $d(x) = 1+x^3$	08
		MODULE - 5	
9	a.	Write short notes on Golay Codes	04
	b.	Consider the (3,1,2) Convolutional encoder with $g^{(1)} = (110)$, $g^{(2)} = (101)$ and $g^{(3)} = (111)$. (i) Find Constraint Length. (ii) Find Rate Efficiency. (iii) Draw the encoder diagram (iv) Find the generator Matrix (v) Find the codeword for the message sequence (11101) using matrix approach and frequency domain approach	12
10.	a.	For a (2,1,3) Convolutional encoder with $g^{(1)} = (1101)$, $g^{(2)} = (1011)$, (i) Write the state transition table (ii) Draw the code tree (iii) Draw the Trellis Diagram (iv) Find the encoded output for the message (11101) by traversing the code tree.	10
	b.	Explain Viterbi Decoding algorithm	06

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15EC552

Visvesvaraya Technological University, Belagavi
MODEL QUESTION PAPER
5th Semester, B.E (CBCS) EC/TC

Course: 15EC552 - Switching & Finite Automata Theory

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Time:3 Hrs **Max. Marks:80**

MODULE - 1			
1	a.	Explain the concept of Threshold Logic.	6
	b.	Discuss the following: (i) Elementary Properties (ii) Unate Function	6
	c.	Determine which of the functions is Unate. Show its minimal form. (i) $f(x_1, x_2, x_3, x_4) = \sum (1,2,3,8,9,10,11,12,14)$ (ii) $f(x_1, x_2, x_3, x_4) = \sum(2,3,6,10,11,12,14,15)$	4
OR			
2	a.	Given the switching function f(x1, x2, x3, x4) = ∑ (2, 3, 6, 7, 10, 12, 14, 15). Find a minimal threshold logic realization.	8
	b.	Show that threshold logic realization of Full Adder requires only two threshold elements.(Note that both sum and carry must be generated)	8
MODULE - 2			
3	a.	Use the map method to find a minimal set of tests for multiple faults for the two-level AND – OR realization of the function f(w, x, y, z) = wz' + xy' + w'x + wx'y	8
	b.	Explain the basic principle of one dimensional path sensitization method.	6
	c.	Define (i) Hazards (ii) Fault Table	2
OR			
4	a.	Discuss the following: (i) Possible strategies in Fault Tolerant Design (ii) Restoring Organs	8
	b.	List the properties of Boolean Differences.	4
	c.	Write a note on Preset Experiments.	4
MODULE - 3			

5	a.	Find the minimal form of machine M shown in Table Q.5(a). Also find the isomorphic machine and deduce its standard form. Table Q.5(a) PS | NS, Z: X=0, X=1 A: E,0 C,0 B: C,0 A,0 C: B,0 G,0 D: G,0 A,0 E: F,1 B,0 F: E,0 D,0 G: D,0 G,0	10
	b.	Define the following: (i) Synchronous Sequential Machine (ii) Equivalent States (iii) Compatible States (iv) Closed State & Closed Covering (v) Compatibility Graph (vi) Merger Table	6
		OR	
6	a.	What is Merger Graph? Draw the Merger Graph and corresponding compatibility graph for the incompletely specified machine M shown in Table Q.6(a). Table Q.6(a) PS | NS, Z: I1, I2, I3, I4 A: - C,1 E,1 B,1 B: E,0 - - - C: F,0 F,1 - - D: - - B,1 - E: - F,0 A,0 D,1 F: C,0 - B,0 C,1	10
	b.	Explain the concept of state equivalence	6
		MODULE - 4	
7	a.	Explain input independence and autonomous clock. For the Machine M shown in Table Q.7(a) find input consistent partition. If the assignments are as follows, find the logical equation for the machine. **Assignments** : A – 000, B - 001, C - 010, D - 011, E - 100, F -101 Draw the realization of machine M using autonomous clock and draw the autonomous clock of machine M. Table Q.7(a) **PS** | **NS**: **X=0**, **X=1** | **Z**: **X=0**, **X=1** A: D C 0 1 B: C D 0 0	10

			C	E	F	0	1	
			D	F	F	0	0	
			E	B	A	0	1	
			F	A	B	0	0	
	b.	What are Covers and implication graph? Explain						6
OR								
8	a.	For the machine M shown in Table Q.8(a), give the closed partition by state splitting. Write the corresponding logical equation and implication graph.						8
		Table Q.8(a)						
			PS	NS		Z		
						X=0	X=1	
				X=0	X=1			
			A	A	B	0	1	
			B	C	B	0	0	
			C	A	C	0	0	
	b.	Write an explanatory note on Parallel Decomposition						8
MODULE - 5								
9	a.	What is an experiment? Explain types of experiments with reference to fault detection.						6
	b.	Describe the concept of Machine Identification.						6
	c.	Write a note on diagnosable machines						4
OR								
10.	a.	Explain Second algorithm for the design of fault detection experiments						6
	b.	Prove the theorem : If an n-state machine has a synchronizing or sequences, then it has one such sequences whose length is at most n(n+1)(n-1) / 6						10

15EC553

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC/TC

Course: 15EC553- Operating Systems

Time: 3 hours **Max. marks: 80**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Module-1

1 a. Explain common tasks performed by the operating System. (08 Marks)
b. Explain Resource allocation techniques. (08 Marks)

Or

2 a. Explain Batch processing systems with a neat diagram. (08 Marks)
b. In Multiprogramming systems I/O bound programs should be given higher priority than CPU bound programs. Justify this with a timing diagram. (08 Marks)

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Module-2

3 a. Explain OS view of Processes. (08 Marks)
b. Explain fundamental state transitions of processes and compare processes with threads. (08 Marks)

Or

4 a. For the given set of processes, perform FCFS and SRN non preemptive scheduling (08 marks)

Processes	P1	P2	P3	P4	P5
Arrival time	0	2	3	5	9
Service time	3	3	2	5	3

b. Explain long, medium and short term scheduling in time sharing systems. (08 marks)

Module-3

5 a. Explain contiguous and non contiguous memory allocation techniques. (08 Marks)
b. Explain Paging and Segmentation. (08 Marks)

Or

6 a. Explain Virtual memory management. (08 marks)
b. Explain FIFO and LRU Page replacement policies. (08 marks)

Module-4

7 a. Explain File systems and IOCS. (08 marks)
b. Explain Direct Access and Index Sequential File Organization. (08 marks)

Or

8 a. Explain allocation of disk space. (08 Marks)
b. Explain Implementation of File access to open a File. (08 Marks)

Module-5

9 a. Define Message passing. Explain how to implement message passing. (08 Marks)
b. Explain mailboxes with its advantages. (08 Marks)

Or

10 a. Explain Resource State Modeling. (08 Marks)
b. Explain deadlock detection algorithm. (08 marks)

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15EC554

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC/TC

Course: 15EC554- Electrical Engineering Materials – Professional Elective

Time: 3 Hours **Max. Marks: 80**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

		Module-1	
1	(a)	Explain Kroning-Penney Model in detail.	7
	(b)	Explain the Formation of Solid Material.	7
	(c)	Find the first three energy levels of an electron in an infinite potential well. The width of the potential well is $5x10^{-2}$. Comment on the result.	2
		OR	
2	(a)	Explain the classification of materials on the basis of band structure.	6
	(b)	Explain hole concept with an example.	10
		Module-2	
3	(a)	Explain the origin of magnetism with an example.	4
	(b)	Explain in detail the Langevin's Theory of Diamagnetism.	10
	(c)	A paramagnetic substance contains $6.5x10^{25}$atoms per m^3 and the magnetic moment of each atom is one Bohr magneton. Find the susceptibility at 300K temperature.	2
		OR	
4	(a)	What are the characteristics of paramagnetic materials? Explain briefly.	6
	(b)	Explain Langevin's Theory of paramagnetism and its modification.	10
		Module-3	
5	(a)	Explain three electric vectors in detail.	7
	(b)	Explain Gauss's Law in dielectric.	7
	(c)	Calculate the polarisation of the He gas if placed in a field of $3x10^5$V/m. The poarisability of He gas is $0.18x10^{-40}Fm^2$ and the concentration of the atoms is $2.6x10^{25}/m^3$. Calculate the separation between positive and negative charges.	2

		OR	
6	(a)	Explain the polar dielectric in ac and dc fields.	8
	(b)	List the factors that influences the dielectric strength.	4
	(c)	What are the applications of Ferroelectric Materials in Devices.	4
		Module-4	
7	(a)	Explain the Ohm's Law in detail.	7
	(b)	Explain the effect of various parameters on Electrical Conductivity.	7
	(c)	The drift velocity is the average velocity exhibited by the electrons in presence of electric field. Calculate the drift velocity of such electrons in an aluminum wire of diameter 1.0mm carrying current of 6A. Assume that 4.5x1028 electrons are available for conduction.	2
		OR	
8	(a)	What are the characteristics of Superconductors?	8
	(b)	Explain the practical applications of Superconductors.	8
		Module-5	
9	(a)	Explain the difference in properties of Hard-Drawn and Annealed copper.	8
	(b)	Explain standard conductors?	4
	(c)	List the steps used for preparation of Tungsten Filaments.	4
		OR	
10	(a)	Explain the properties in detail for selecting the insulating material.	12
	(b)	Find the thermal conductivity of a metal containing $3x10^{22}$ electronics/cm^3 at 300K. The average collision time between electrons and the obstacles is $3x10^{-14}$s. Take Lorentz number=$2.44x10^{-8}$ohmW/k2; the mass of electron is $9.1x10^{-3}$1kg.	4

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15EC555

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS) EC

Course: 15EC555 - MSP430 Microcontroller

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

Time: 3 Hrs **Max. Marks: 80**

Module-1			
1	a.	Sketch the functional block diagram of MSP430 microcontroller and briefly explain its architecture.	10
	b.	Show the Memory map of F2013 MSP430 and explain it briefly.	06
OR			
2	a.	Differentiate between a Microprocessor and a Microcontroller. Which are the different peripherals that would be available in a Microcontroller?	04
	b.	Briefly explain about the 16 Registers of MSP430 CPU.	06
	c.	Explain briefly the different Resets provisions in MSP430 and the conditions after Reset.	06
Module-2			
3	a.	With an example explain the different Addressing Modes of data available for MSP430.	10
	b.	Write an ALP to move six bytes of data present in a memory block to another memory block.	06
OR			
4	a.	Indicate the different Arithmetic instructions available for MSP430 and explain their operation briefly.	10
	b.	Write an ALP to check whether the content of the Register R4 of MSP430 is Even/Odd. If it is Even, set the value of the Register R5 to 00EEH, otherwise reset it to 0000H.	06
Module-3			
5	a.	Explain the Clock system of MSP430 with the help of its simplified block diagram.	10
	b.	Which are the Low Power operating modes of MSP430? Explain them briefly.	06

		OR	
6	a.	Write a MSP430 C program to toggle two LEDs connected to P2.3 and P2.4 bits of Olimex 1121STK kit, using the interrupt generated by channel 0 of Timer_A in up mode.	08
	b.	Explain the operation and uses of Watchdog timer in MSP430.	06
	c.	Differentiate between the Capture and Compare mode of operations of Timer_A of MSP430.	02
		Module-4	
7	a.	Explain the architecture and operation of Comparator_A+ of MSP430 with the help of a block diagram.	08
	b.	Give a circuit diagram using MSP430F2002 to measure an analog voltage and explain the scheme of measurement.	08
		OR	
8	a.	Explain the operation of Sigma-Delta ADC of MSP430 with its block diagram.	08
	b.	With an example explain how a PWM wave can be generated using MSP430 CPU.	08
		Module-5	
9	a.	Which are the Eight registers that are associated with the configuration of Port1 of MSP430? Explain their functions briefly.	08
	b.	Interface a simple LED to MSP430 and write a C program to flash the LED using an appropriate software delay.	05
	c.	Give the format of Asynchronous serial data communication.	03
		OR	
10	a.	Explain briefly about the Communication peripherals that are available in MSP430.	06
	b.	Interface a Push button switch and a simple LED to MSP430 and write a C program to switch on the LED whenever the button is pressed.	08
	c.	Write a note on RS232 standard.	02

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15TE555

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER

5th Semester, B.E (CBCS), Telecommunication (Elective)

Course: 15TE555- Transmission Lines and Waveguides

Max Marks: 80 **Time: 3 Hours**

Note: (i) Answer Five full questions selecting any one full question from each Module.
(ii) Question on a topic of a Module may appear in either its 1st or 2nd question.

1	(a)	Derive the expression Z_0, propagation constant(Υ) and phase velocity(V_p) for Telephone cable.	08
	(b)	With necessary equation, draw the equivalent T – section for transmission line.	08
		OR	
2	(a)	Define the following terms. (i)Reflection coefficient. (ii) Reflection factor	08
	(b)	A 10km long telephone line has R = 196Ω,L = 7.1mH, C = 0.09μF and negligible G. If a potential 10V at 796Hz is applied at the input and receiving end short circuited, find the value of short circuited current and its phase.	08
3	(a)	What are the standing waves and standing wave ratio? Establish the relation between S and K.	08
	(b)	Obtain the expression for input impedance in open and short circuited line.	08
		OR	
4	(a)	What is stub matching? Explain the various steps involved in single stub matching, using Smith chart.	08
	(b)	A (200+j75) ohm load is to be matched to a 30 Ω line to give SWR = 1. Find the reactance of the stub and the characteristics impedance of quarter wave transformer, both connected directly to a load.	08
5	(a)	Starting from Maxwell's equation, derive the field component of TEM wave inside the parallel plane system.	08
	(b)	A rectangular waveguide has dimensions a = 2.5cm and b = 1cm. A signal of frequency 8.6Ghz is to be propagated. Find all the possible modes.	08
		OR	
6	(a)	Draw the TE_{11} and TM_{11} field configuration inside a rectangular waveguide.	08
	(b)	A rectangular waveguide has λ_c of 10cm for TE_{10} mode and λ_c of 4cm for TE_{21} mode. Find the dimension of the waveguide.	08

7	(a)	Explain the working principle of GUNN Diode.	08
	(b)	A typical BARITT diode has the following: Relative dielectric constant, ϵ_r =12.5, Donor concentration = N = $3.2 \times 10^{12}/m^3$. ϵ_o =$8.854 \times 10^{-12,}$ Drift length, L = 8μm. Calculate: (i)Critical voltage (ii) Breakdown electric field (iii) Breakdown voltage.	08
		OR	
8	(a)	With neat sketches, explain the IMPATT Diode and draw the negative resistance curve.	08
	(b)	Explain the parametric amplifier with equivalent circuit.	08
9	(a)	Explain the construction and field pattern for microstrip line.	08
	(b)	What are the different losses taking place in microstrip line? Explain.	08
		OR	
10	(a)	With neat schematic diagram, explain the coplanar strip lines.	08
	(b)	Explain Shielded strip lines.	08