

CBCS SCHEME

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21EC/EI/BM61

Sixth Semester B.E. Degree Examination, June/July 2024 Technological Innovation Management & Entrepreneurship

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define Management. Explain the various functions of management. (10 Marks)
b. Discuss and justify management as a Science, Art and Profession. (10 Marks)

OR

- 2 a. Explain Types, Steps and Limitation of planning. (10 Marks)
b. What are managerial skills? Explain. (06 Marks)
c. Distinguish between Management and Administration. (04 Marks)

Module-2

- 3 a. Define Organization. Briefly explain the principle of organizing. (10 Marks)
b. What is Departmentalization? Explain process and purpose of Departmentalization. (10 Marks)

OR

- 4 a. With the help of diagram, explain Maslows need hierarchy theory with examples. (10 Marks)
b. Discuss the requirements of effective direction. (05 Marks)
c. Explain the importance of communication. (05 Marks)

Module-3

- 5 a. Explain functions of a Leader. (10 Marks)
b. What is the behavioural approach of Leadership? Explain. (10 Marks)

OR

- 6 a. Explain the different views of social responsibility of a business. (10 Marks)
b. Write a short note on need for control system. (05 Marks)
c. What is Social Audit? Explain its benefits and limitation. (05 Marks)

Module-4

- 7 a. What is Entrepreneurship? Explain the functions of an Entrepreneurship. (10 Marks)
b. Explain the various types of family Business. (04 Marks)
c. List the problem faced by an Entrepreneur. (06 Marks)

OR

- 8 a. How to Identify the business opportunity? Explain. (10 Marks)
b. Describe the various methods used for Generating business ideas. (10 Marks)

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.

Module-5

- 9 a. What is Business plan? Explain the purpose of business plan. (10 Marks)
b. Explain the National board for micro, small and medium Enterprises (NBMSME) with its objective and scope. (10 Marks)

OR

- 10 a. Write a short note on :
(i) State Industrial Development Corporation (SIDCs).
(ii) State industrial area development board (SIADB) (10 Marks)
- b. Explain the functions of,
(i) Small Industries Development Bank of India (SIDBI).
(ii) Technical Consultancy Organization (TCO). (10 Marks)

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Sixth Semester B.E. Degree Examination, June/July 2024 Microwave Theory and Antennas

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With the help of drift velocity graph and wave from, explain the constructional feature and working of n-type GaAs diode. (10 Marks)
- b. A transmission line has the following primary constants $R = 2 \Omega/m$, $L = 8 \text{ nH/m}$, $G = 0.5 \text{ mS/m}$, $C = 0.23 \text{ pF/m}$ and $f = 1 \text{ GHz}$. Find :
 - (i) Characteristic impedance Z_0 .
 - (ii) Propagation constant γ
 - (iii) Wavelength λ .
 - (iv) Phase velocity V_p (10 Marks)

OR

- 2 a. Derive the expression for the voltage of current at any point on the transmission line equation and solution starting from the fundamentals. (10 Marks)
- b. Explain the standing waves with neat waveforms. (10 Marks)

Module-2

- 3 a. Derive scattering parameters for a multiport network. (10 Marks)
- b. The transmission lines of characteristic impedances Z_1 and Z_2 are joined at plane PP'. Express S-parameters in terms of impedances. (10 Marks)

OR

- 4 a. Derive S-matrix for a Magic Tee with neat diagram and its applications. (10 Marks)
- b. Explain the working of precision Dielectric Rotary phase shifter. (10 Marks)

Module-3

- 5 a. Discuss the operation of micro strip lines with its structure. Compare strip line and microstrip line. (10 Marks)
- b. Explain the operation of parallel strip line along with a neat diagram. Write down the expression for characteristic impedance. (10 Marks)

OR

- 6 a. Explain the following terms as related to antenna system :
 - (i) Directivity and gain.
 - (ii) Beam area.
 - (iii) Effective height
 - (iv) Bandwidth (10 Marks)
- b. A radio link has a 15 W transmitter connected to an antenna of 2.5 m^2 effective aperture at 5 GHz. The receiving antenna has an effective aperture 0.5 m^2 and is located 15 km line of sight distance from the transmitting antenna. Assuming loss less, matched antenna, find the power delivered to the receiver. (10 Marks)

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Module-4

- 7 a. Explain the field pattern and phase pattern with a neat diagram. (10 Marks)
 b. Derive an expression and draw the field pattern for an array of two isotropic point sources situated symmetrical with respect to origin with equal amplitude and phase spaced $\frac{\lambda}{2}$ apart. (10 Marks)

OR

- 8 a. Derive an expression for field of a dipole in general for the case of thin linear antenna. (10 Marks)
 b. Find the directivity D for the sources with radiation intensity :
 (i) $U = U_m \sin^2 \theta$, $0 \leq \theta \leq \pi$, $0 \leq \phi \leq 2\pi$
 (ii) $U = U_m \cos^2 \theta$, $0 \leq \theta \leq \frac{\pi}{2}$, $0 \leq \phi \leq 2\pi$ (10 Marks)

Module-5

- 9 a. Derive an expression for field strength E_ϕ and H_ϕ in case of small loop antenna. (10 Marks)
 b. Derive an expression for radiation resistance of a small loop antenna. (10 Marks)
- OR
- 10 a. Derive an expression for radiation resistance of a short dipole antenna. (10 Marks)
 b. Explain the different types of horn antenna with a diagram. (10 Marks)

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21EC63

Sixth Semester B.E. Degree Examination, June/July 2024 VLSI Design and Testing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. State Moore's law, elaborate with graph. (04 Marks)
- b. Derive the expression for drain current in linear and saturation regions. (10 Marks)
- c. Explain the following non-ideal characteristics: (06 Marks)
 - i) Body effect
 - ii) Channel length modulation.

OR

- 2 a. Explain working of nMOS enhancement mode transistor operation with neat sketches and relevant equations. (08 Marks)
- b. Draw inverter circuit and explain its DC transfer characteristics. (08 Marks)
- c. Draw the schematic of (04 Marks)
 - i) $F = A + BC$
 - ii) $F = \overline{AB + CD}$.

Module-2

- 3 a. Explain CMOS fabrication process with necessary diagrams. (10 Marks)
- b. With relevant equations explain transient response of CMOS inverter. (05 Marks)
- c. With neat diagrams explain layout design rules. (05 Marks)

OR

- 4 a. Draw the stick diagram and layout of three input NAND gate. (06 Marks)
- b. Find maximum and minimum rise time and fall time delays of two input NAND gate. (06 Marks)
- c. Estimate the minimum delay of the path from A to B in Fig.Q.4(c) and choose transistor sizes to achieve this delay. The initial NAND2 gate may present a load of 8λ of transistor width on the input and the output load is equivalent to 45λ of transistor width.

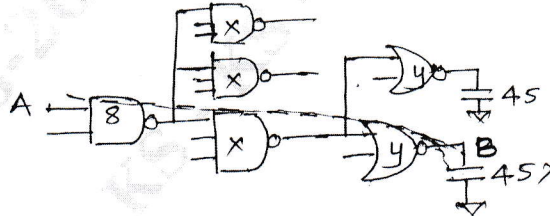


Fig.Q.4(c)

(08 Marks)

Module-3

- 5 a. Explain the operation of three transistor DRAM cell with necessary timing diagrams. (08 Marks)
- b. Draw the structure of NAND flash memory cell and explain the operation. (06 Marks)
- c. Explain ferroelectric RAM with necessary diagrams. (06 Marks)

OR

- 6 a. Explain read and write operations of SRAM cell with necessary diagrams. (08 Marks)
 b. What is row decoder? Explain with an example. (06 Marks)
 c. Explain data programming and erasing methods of flash memory. (06 Marks)

Module-4

- 7 a. Briefly explain different types of faults in digital circuits. (08 Marks)
 b. Consider the logic circuit shown in Fig.Q.7(b) find Boolean difference with respect to x_3 .

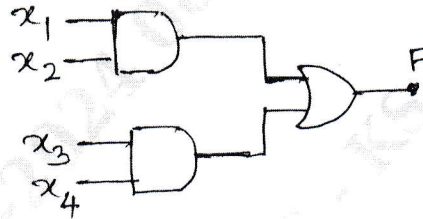


Fig.Q.7(b)

- c. Explain detection of multiple faults in combinational logic circuits. (06 Marks)

OR

- 8 a. With neat sketch, explain path oriented decision making algorithm. (10 Marks)
 b. For a given logic network determine tests for checking all single node faults (Fig.Q.8(b))

$$F = \bar{x}_1 x_2 \bar{x}_3 + x_1 \bar{x}_2 x_3$$

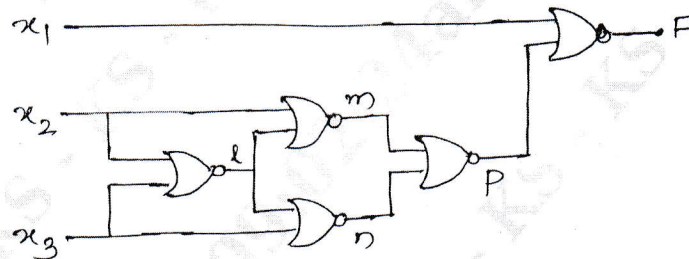


Fig.Q.8(b)

Module-5

- 9 a. Briefly explain :
 i) Controllability ii) Observability. (06 Marks)
 b. Explain adhoc design rules for improving testability. (06 Marks)
 c. With neat diagram explain partial scan. (08 Marks)

OR

- 10 a. List LSSD design rules. (10 Marks)
 b. Explain test generation based on functional fault models. (10 Marks)

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21EC642

Sixth Semester B.E. Degree Examination, June/July 2024

Cryptography

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the division algorithm with an example. (07 Marks)
- b. Define Ring. State six properties of Rings. (07 Marks)
- c. Explain the Euclidean algorithm. Calculate the GCD(60, -24) (06 Marks)

OR

- 2 a. Lists the properties of modular arithmetic for integer in $2n$ with expression. (07 Marks)
- b. Explain the polynomial arithmetic. Find polynomial arithmetic over $GF(2)$ for $f(x) = x^7 + x^5 + x^4 + x^3 + x + 1$ and $g(x) = x^3 + x + 1$. (07 Marks)
- c. Develop set of tables for polynomial arithmetic modulo of $x^3 + x + 1$ over $GF(2^3)$. (06 Marks)

Module-2

- 3 a. Draw and explain model of symmetric encryption. (07 Marks)
- b. Explain the playfair cipher and its rules for the following keyword : "MONARCHY" plaintext : "Cryptography". (07 Marks)
- c. Explain the vernam Cipher with a neat diagram. (06 Marks)

OR

- 4 a. Draw and explain model of symmetric cryptosystem. (07 Marks)
- b. Explain the Caesar Cipher technique Encrypt plaintext "Cryptography" with key = 3. (06 Marks)
- c. Using Hill Cipher algorithm Encrypt the plaintext "paymoremoney" using the key,

$$K = \begin{bmatrix} 17 & 17 & 5 \\ 21 & 18 & 21 \\ 2 & 2 & 19 \end{bmatrix}$$

(07 Marks)

Module-3

- 5 a. State and prove Euler's theorem. (05 Marks)
- b. Explain the DES encryption algorithm with neat diagram. (10 Marks)
- c. Explain Block Cipher with neat diagram. (05 Marks)

OR

- 6 a. Explain Feistel encryption and decryption with neat diagram. (10 Marks)
- b. State and prove Fermat's theorem. (05 Marks)
- c. Explain Euler's Totient function. Determine (i) $\phi(37)$ and $\phi(35)$. (05 Marks)

Module-4

- 7 a. Bring out differentiate between conventional encryption and public-key encryption. Explain the requirement of public-key cryptography. (10 Marks)
- b. Explain RSA algorithm. Using RSA algorithm perform encryption and decryption using $p = 17$, $q = 11$, $e = 7$ and $M = 88$. (10 Marks)

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OR

- 8 a. Explain the Diffie-Hellman key exchange algorithm. Evaluate a Diffie-Hellman key exchange for $q = 23$ and $\alpha = 9$.
- (i) If User A has private key $X_A = 4$
What is A's public key $Y_A = ?$
 - (ii) If User B has private key $X_B = 3$
What is B's public key $Y_B = ?$
 - (iii) What is shared key ?
- b. Describe Elgamal cryptographic system.

(10 Marks)

(10 Marks)

Module-5

- 9 a. Write short notes on, (i) NANOTEQ (ii) A5 (iii) Linear Congruential generator.
- b. Explain Additive generator.
- c. With a neat diagram, explain Threshold generator.

(10 Marks)

(06 Marks)

(04 Marks)

OR

- 10 a. Explain linear feedback shift register with a neat diagram.
- b. With a neat diagram, explain Geffe generator and Jennings generator.
- c. Explain Gifford with a neat diagram.

(06 Marks)

(10 Marks)

(04 Marks)

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21EC643

Sixth Semester B.E. Degree Examination, June/July 2024

Python Programming

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List and explain the significant features of Python programming language. (08 Marks)
- b. Write the math operators in Python from highest to lowest precedence with an example for each. Write the steps how Python is evaluating the expression $(5 - 1) * (7 + 1) / (3 - 1)$ and reduces it to a single value. (06 Marks)
- c. Demonstrate the syntax of Python functions : print(), input() and str() with examples. (06 Marks)

OR

- 2 a. With proper syntax and examples, explain the control statements.
i) if ii) else iii) elif iv) break statement. (08 Marks)
- b. Explain the local and global scope of the variable with a suitable example. (06 Marks)
- c. Write a Python snippet to generate the Fibonacci series. (06 Marks)

Module-2

- 3 a. What are the lists? Explain append(), insert() and remove() methods with examples. (08 Marks)
- b. For the following two questions, spam contains the list ['a', 'b', 'c', 'd', [3, 4, 7, 2]]
i) What does span [-2] evaluate to?
ii) What does span [4] [1] evaluate to? (05 Marks)
- c. Demonstrate with example of upper(), lower(), and isupper() and islower() string methods. (07 Marks)

OR

- 4 a. What is a dictionary? Compare dictionaries with lists. Write a program to count the number of occurrences of characters in string. (08 Marks)
- b. Write a program to implement search and replace multiple occurrences of a given substring in the main string in a list. (07 Marks)
- c. Define Tuple data type, explain converting types with the list() and tuple () Functions. (05 Marks)

Module-3

- 5 a. With example, explain the following Pattern Matching with Regular Expressions.
i) Grouping with Parentheses
ii) Matching Multiple Groups with the Pipe. (10 Marks)
- b. What are the steps involved in file handling? Also, explain the reading and writing process with suitable examples in Python. (10 Marks)

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OR

- 6 a. Explain the basic steps for creating and finding regular expression objects with Python. (06 Marks)
- b. Write a python program to accept USN and marks objected. Find maximum, minimum and USN students who scored 100-85, 85-75, 75-60 and below 60 marks separately. (06 Marks)
- c. Explain the purpose of the following special characters used in optimal matching regular expression: ?, *, +, and {}. Illustrate with example. (08 Marks)

Module-4

- 7 a. Differentiate between class variables and instance variables with suitable examples. (05 Marks)
- b. Write a program to create a class classed Rectangle with the help of a corner point, width and height. Write the following function sand demonstrate their working :
- i) To find and display the center of the rectangle
 - ii) To display point as an ordered pair
 - iii) To resize the rectangle
 - iv) To find area and perimeter of a rectangle. (10 Marks)
- c. Justify the statement "Objects are mutable" with suitable examples. (05 Marks)

OR

- 8 a. Explain – init_() and – str_() methods with an example. (10 Marks)
- b. Explain operator overloading and polymorphism with examples. (10 Marks)

Module-5

- 9 a. Write a Python program that makes a socket connection to a web server and follows the rules of the HTTP protocol to request a document and display what the server sends back. (10 Marks)
- b. Illustrate with a python program how to retrieve web pages with urllib. (10 Marks)

OR

- 10 a. What is Service – Oriented Architecture (SOA)? List out the advantages of SOA. (06 Marks)
- b. Discuss various keys used in the database model. (06 Marks)
- c. Write the four SQL commands needed to create and maintain data. (08 Marks)
