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21EC/EI61

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Technological Innovation Management and 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 and explain the functions of management. (08 Marks)
- b. Is management a science or art? Explain. (06 Marks)
- c. Explain the various roles of manager. (06 Marks)

OR

- 2 a. Explain the different levels of management along with skills required. (07 Marks)
- b. Distinguish between Management and Administration. (05 Marks)
- c. Explain the various steps involved in decision making process. (08 Marks)

Module-2

- 3 a. Briefly explain the principles of organization. (10 Marks)
- b. What is Departmentalisation? Explain the advantages and disadvantages of committees in an organization. (10 Marks)

OR

- 4 a. Explain Maslow's hierarchy need theory. (10 Marks)
- b. Explain the various steps involved in selection process. (10 Marks)

Module-3

- 5 a. What is the meaning of social responsibility of business? Explain Social responsibility of business towards different groups. (10 Marks)
- b. What is a social audit? Explain its benefits and limitations. (10 Marks)

OR

- 6 a. Write a short note on behavioural approach of leadership. (04 Marks)
- b. Explain any four essentials of an effective control system. (08 Marks)
- c. What is corporate governance? List the benefits of Good Corporate Governance. (08 Marks)

Module-4

- 7 a. Briefly explain any four characteristics of a successful entrepreneurship. (10 Marks)
- b. Explain the strategies in capacity building for entrepreneurship. (10 Marks)

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OR

- 8 a. Discuss about the business opportunities in India. (10 Marks)
b. Write a short note on Mobility of Entrepreneurs. (10 Marks)

Module-5

- 9 a. Explain the formalities for starting business enterprise. (10 Marks)
b. Discuss the reasons behind the failure of certain business plan. (10 Marks)

OR

- 10 a. Briefly explain about NGO's (Non governmental organizations). (10 Marks)
b. Write a short note on:
(i) TCO's (Technical Consultancy Organizations)
(ii) SIDBI (Small Industries Development Bank of India). (10 Marks)

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Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
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. Derive Transmission line Equations in voltage and current forms. (08 Marks)
- b. List the characteristics of Smith Chart. (07 Marks)
- c. A certain transmission line has a characteristic impedance of $75 + j0.01 \Omega$ and is terminated in a load impedance of $70 + j50 \Omega$, compute
 - (i) Reflection co-efficient
 - (ii) Transmission co-efficient. (05 Marks)

OR

- 2 a. With neat diagram, explain the typical Microwave system. (07 Marks)
- b. A transmission line has the following parameters, $R = 2\Omega/m$, $G = 0.5 \text{ mmho/m}$, $f = 1 \text{ GHz}$, $L = 8 \text{ nH/m}$, $C = 0.23 \text{ PF}$. Calculate (i) Characteristic impedance (ii) Propagation constant (05 Marks)
- c. With the help of a functional block diagram, explain construction and modes of working of a GUNN Diode. (08 Marks)

Module-2

- 3 a. Write the S-matrix representation for Mutliport network. (07 Marks)
- b. With a neat diagram, explain the working of precession type variable attenuator. (08 Marks)
- c. A 20 mW signal is fed into one of the collinear Port 1 of a lossless H-plane T-junction. Calculate the power delivered through each port when other ports are terminated in Matched load. (05 Marks)

OR

- 4 a. State and explain the properties of S-matrix. (07 Marks)
- b. What is Magic-tee? Derive its scattering matrix. (07 Marks)
- c. In an H-plane T-junction, compute power delivered to the loads of 40 ohm and 60 ohm connected to arms-1 and 2 when a 10 mW power is delivered to the matched Port 3. (06 Marks)

Module-3

- 5 a. Discuss briefly Micro-strip lines and its losses and also derive the expression for Quality factor. (08 Marks)
- b. Define the following terms with respect to antennas:
 - (i) Radiation Intensity
 - (ii) Beam area.
 - (iii) Directivity
 - (iv) Beam efficiency. (08 Marks)
- c. 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 of 0.5 m^2 and is located at 15 km line of sight distance from the transmitting antenna. Assume lossless antennas. Find the power delivered to the receiver. (04 Marks)

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OR

- 6 a. A lossless parallel strip line has a conducting strip width W . The substrate dielectric separating the two conducting strips has a relative dielectric constant ϵ_{rd} of 6 and a thickness d of 4 mm. Calculate
- The required width W of the conducting strip in order to have a characteristic impedance of 50Ω .
 - The strip line capacitance.
 - The strip line inductance.
 - The phase velocity of the wave in the parallel strip lines. (08 Marks)
- b. Show that maximum effective aperture of a $\lambda/2$ dipole antenna is $0.13 \lambda^2$. (06 Marks)
- c. Find the Directivity of the following using Exact method,
- $U = U_m \sin^2 \theta \sin^3 \phi$
 - $U = U_m \cos^4 \theta \sin^2 \phi$ where $0 \leq \theta \leq \frac{\pi}{2}$, $0 \leq \phi \leq 2\pi$. (06 Marks)

Module-4

- 7 a. Derive the expression and draw the field pattern for two isotropic point sources of the same Amplitude and same phase. (08 Marks)
- b. Derive the expression for radiation resistance of short electric dipole. (08 Marks)
- c. Find the length of an Elementary dipole having a radiation resistance of 5Ω at a frequency of 5 MHz. (04 Marks)

OR

- 8 a. Derive array factor expression in case of n isotropic point sources of equal Amplitude and spacing. (07 Marks)
- b. Starting from Electric and Magnetic field potential, obtain the far field components for a short dipole. (10 Marks)
- c. For a short dipole $\frac{\lambda}{15}$ long find the radiation resistance. (03 Marks)

Module-5

- 9 a. Obtain the expression for radiation resistance of small loop antenna. (07 Marks)
- b. Briefly explain helical antenna with its helical geometry. (05 Marks)
- c. Find the length L , H-plane aperture and flare angle θ_E and θ_H of pyramidal horn for which E-plane aperture is 10λ Horn is fed by a rectangular waveguide with TE_{10} mode. Assume $\delta = 0.2\lambda$ in E-plane and 0.375λ in H-plane. Also find beam widths and directivity. (08 Marks)

OR

- 10 a. Derive the expression for strength E_ϕ and H_θ in case of small loop Antenna. (08 Marks)
- b. Explain different types of Horn Antenna. (06 Marks)
- c. Design Yagi-Uda antenna of six elements to provide a gain of 12 dB, if the operating frequency is 200 MHz. (06 Marks)

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21EC63

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 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. Realize the CMOS compound gate for the following functions:
(i) $Y = \overline{ABC + D}$ (ii) $Y = \overline{A(B + C) + DE}$ (08 Marks)
b. Implement a positive edge triggered D flip flop using transmission gate and write the necessary timing diagram. (08 Marks)
c. Analyze the working of tristate inverter. (04 Marks)

OR

- 2 a. Draw the circuit diagram of CMOS inverter and derive its transfer characteristics by graphical method. (06 Marks)
b. Derive the equation for drain current of a MOSFET in non-saturated and saturated region of operation. (10 Marks)
c. Explain the following non-ideal effects of MOSFETs:
(i) Channel length modulation (ii) Mobility degradation. (04 Marks)

Module-2

- 3 a. With neat diagrams, explain the complete CMOS n-well fabrication process. (10 Marks)
b. Draw the layout diagram for the following function and also estimate the area.
 $Y = \overline{(A + B + C)D}$ (10 Marks)

OR

- 4 a. Using Elmore delay model estimate the t_{pdf} and t_{pdr} of a 3-input NAND gate if the output is loaded with 'h' identical gates. (08 Marks)
b. Find the logical effort and parasitic delay of (i) 2 input NOR gate and (ii) 3-input NAND gate. (06 Marks)
c. Construct necessary equivalent circuit for the computation of t_{pdf} of an inverter driving another inverter using RC delay model. (06 Marks)

Module-3

- 5 a. With necessary circuit diagrams explain the operation of (i) 4 transistor DRAM and (ii) 3 transistor DRAM cells. (10 Marks)
b. Explain the operation of full CMOS SRAM cell with necessary circuit topology. (06 Marks)
c. Explain the hysteresis characteristics of ferroelectric capacitor with necessary diagram. (04 Marks)

OR

- 6 a. Explain the operation of 4×4 NOR based ROM array with necessary circuit diagram. (08 Marks)
b. With necessary circuit diagram and bias conditions, explain the operation of NOR flash memory. (06 Marks)
c. Explain binary tree based column decoder design with necessary diagram. (06 Marks)

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Module-4

- 7 a. Differentiate between fault and failure with an example. Explain different types of stuck at fault with example. (06 Marks)
- b. Explain feedback bridging fault with an example. (06 Marks)
- c. For the circuit shown in Fig.Q7(c), using Boolean difference (i) detect s-a-0 and s-a-1 at x_1 , (ii) determine partial Boolean difference for $x_2 - l - n - p - F$.

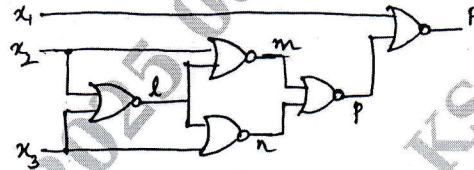


Fig.Q7(c)

(08 Marks)

OR

- 8 a. What is fault diagnosis? Explain delay fault detection with an example. (08 Marks)
- b. Find the test pattern for line 6 s-a-0 for the circuit shown in Fig.Q8(b) using D algorithm.

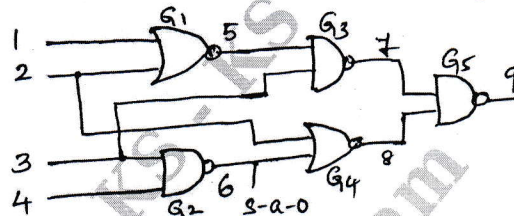


Fig.Q8(b)

(12 Marks)

Module-5

- 9 a. For the state table shown in Table Q9(a), find
(i) Response for 010 sequence, (ii) Homing tree, (iii) Distinguishing tree.

Present State	Input	
	$x = 0$	$x = 1$
A	B, 0	D, 0
B	A, 0	B, 0
C	D, 1	A, 0
D	D, 1	C, 0

Table Q9(a)

(10 Marks)

- b. Write a note on functional fault model to detect faults in sequential circuits. (05 Marks)
- c. Explain the process of testing sequential circuit as iterative combinational circuits. (05 Marks)

OR

- 10 a. Define the terms controllability and observability with an example. (05 Marks)
- b. With a neat logic diagram, explain clocked hazard free latches used in LSSD technique. (08 Marks)
- c. Explain partial scan technique using system clock with necessary diagram. (07 Marks)

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21EC642

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 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 Euclidean algorithm to find the GCD of two numbers with the help of an example where $a = 234$, $b = 42$. (10 Marks)
- b. What is modulus and congruent modulo n . State the properties of congruences with the help of an example for each. (10 Marks)

OR

- 2 a. Explain division algorithm with the help of number line. And also state the properties of disability for integers. (10 Marks)
- b. Explain the procedure used for finding the multiplicative inverse in $GF(P)$ perform arithmetic operations in $FG(7)$. (10 Marks)

Module-2

- 3 a. With the help of neat block diagram, explain the model for network security. (10 Marks)
- b. Explain the procedure involved in encrypting a message using play-fair cipher. A message to be sent at an wireless station in play-fair cipher is "cryptography" using the key "MONARCHY" encrypt the message. (10 Marks)

OR

- 4 a. Explain the procedure involved in encrypting a message using hill cipher for $m = 3$ encrypt the message "herbre" using the hill cipher with the key $\begin{bmatrix} 3 & 7 \\ 5 & 12 \end{bmatrix}$. Find whether decryption is possible or not. Show your calculations and result. (10 Marks)
- b. Explain passive and active attacks in network security. (10 Marks)

Module-3

- 5 a. With the help of neat block diagram, explain the salient features of DES encryption algorithm. (10 Marks)
- b. Explain Euler's theorem with example as $a = 2$, $n = 11$. (10 Marks)

OR

- 6 a. Given the plaintext $\{000102030405060708090A0B0C0D0E0F\}$ and the key $\{010101010101010101010101010101010101\}$
 - i) Show the original contents of state, displayed as a 4×4 matrix
 - ii) Show the value of state after initial Addround key
 - iii) Show the value of state after shift rowsMake use of AES algorithm. (10 Marks)
- b. Explain the choice of the parameters used in the design of traditional block cipher/Feistel cipher. (10 Marks)

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Module-4

- 7 a. Explain the applications and requirements of public-key cryptosystems. (10 Marks)
b. Assuming $p = 7$ and $q = 17$, find the public key and private key. Perform encryption and decryption for plain text message block $M = 6$. (10 Marks)

OR

- 8 a. Show that in Diffie – Hellman key exchange algorithm, the keys generated at sender side and receiver side are same. Assuming $q = 23$ and $\alpha = 5$, users A and B select their private keys $X_A = 6$ and $X_B = 15$ compute their public key Y_A and Y_B and shared secret key K. (10 Marks)
b. Describe the Elliptic curve cryptography. (10 Marks)

Module-5

- 9 a. Explain LFSR and how the shift register sequences are used in cryptography. (10 Marks)
b. Write a note on design and analysis of stream cipher. (10 Marks)

OR

- 10 a. With a neat diagram, explain generalized Geffe generator. (10 Marks)
b. Write short notes on :
i) A5 to encrypt GSM
ii) NANOTEQ and RAMBUTAN. (10 Marks)

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21EC643

Sixth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 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. Explain for loop with respect to the range function with the help of an example. (08 Marks)
- b. List out the boolean and comparison operators with their functions. (07 Marks)
- c. Write a program to accept only the integer from the user and to classify the accepted input as even or odd number. Include try and except for input validation. (05 Marks)

OR

- 2 a. List any three built-in functions. Explain the definition and function call of the user defined functions along with parameter and return statements with example. (08 Marks)
- b. List out the rules to be followed while creating the variables. Explain the significance of global statement with an example. (07 Marks)
- c. Write a program to find the factorial of a number using function. (05 Marks)

Module-2

- 3 a. Explain the following with respect to lists with an example for each:
(i) Negative indexing (ii) Slicing
(iii) Concatenation (iv) Replication (08 Marks)
- b. Explain the following dictionary methods with an example:
(i) keys(), values(), items()
(ii) get()
(iii) setdefault() (07 Marks)
- c. Write a program using lists to store N numbers accepted from the user and to display the list average. (05 Marks)

OR

- 4 a. Explain any four list methods with an example for each. (08 Marks)
- b. Explain all the string methods with an example for each. (07 Marks)
- c. Write a program to create a dictionary of 10 items (USN: Marks) pairs by accepting the inputs from the user. Display the item with the maximum and minimum marks. (05 Marks)

Module-3

- 5 a. List out the steps involved in matching a regular expression. (08 Marks)
- b. With the help of an example explain the variable saving process with shelve module. (07 Marks)
- c. Write a program to find the total size of all the files in a directory. (05 Marks)

OR

- 6 a. Briefly explain character classes in Regular expression module. (08 Marks)
- b. Explain the methods related to the absolute and relative paths. (07 Marks)
- c. Write a program to search for lines having '@' sign between characters in a read text file. (05 Marks)

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Module-4

- 7 a. Explain pure and modifier functions with an example for each. (08 Marks)
b. Explain operator overloading with an example. (07 Marks)
c. Write a program that uses class to store the name and marks of students. Use list to store the marks in 3 subjects. (05 Marks)

OR

- 8 a. Explain classes, objects and attributes with an example. Show that objects are mutable with the help of a snippet. (08 Marks)
b. Explain `__init__` and `__str__` methods with an example. (07 Marks)
c. Write a program to create two objects of the class point with x and y coordinates as attributes. Pass these two objects to a function which computes and displays the distance between the two points. (05 Marks)

Module-5

- 9 a. Explain HTML parsing using BeautifulSoup with the help of an example. (08 Marks)
b. Explain XML parsing with the help of an example. (07 Marks)
c. Write a program to retrieve a text document from the web using urllib. (05 Marks)

OR

- 10 a. Explain JSON parsing with the help of an example. (08 Marks)
b. Explain the creation of a database table with the help of an example. (07 Marks)
c. Briefly explain the three kinds of keys used in database model. (05 Marks)

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