

CBCS SCHEME

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18CS51

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Management and Entrepreneurship for IT Industry

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 bring out its characteristics. (06 Marks)
b. Explain the skill set required for different levels of Managers. (08 Marks)
c. Briefly explain the roles of Manager. (06 Marks)

OR

- 2 a. Define Planning. Explain the importance of Planning. (06 Marks)
b. Briefly explain the steps in Planning. (08 Marks)
c. Explain the process of Staffing selection. (06 Marks)

Module-2

- 3 a. Explain Maslow's need Hierarchy theory of motivation. (06 Marks)
b. Briefly explain the leadership styles. (06 Marks)
c. Define Directing and explain briefly its important requirements. (08 Marks)

OR

- 4 a. Explain the steps involved in the process of controlling. (06 Marks)
b. Explain the importance of Communication. (06 Marks)
c. What are the techniques used to establish control? (08 Marks)

Module-3

- 5 a. Define Entrepreneurship. Explain briefly stages of Entrepreneurship. (08 Marks)
b. Differentiate between Entrepreneur and Intrapreneur. (06 Marks)
c. Explain Market Feasibility study. (06 Marks)

OR

- 6 a. What is the role of Entrepreneurship in Economic development? (08 Marks)
b. Discuss Technical and Financial feasibility study. (06 Marks)
c. What are the sources of Business ideas? (06 Marks)

Module-4

- 7 a. What is Project Report? Explain the guidelines provided by Planning Commission for preparation of Project Report. (10 Marks)
b. Explain Marketing Management and Supply Chain Management. (10 Marks)

OR

- 8 a. What is ERP? Discuss the importance of ERP to a Company. (08 Marks)
b. Explain types of Report and methods of Report generation. (12 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. Write a short notes on :
i) DIC ii) NSIC. (10 Marks)
b. Discuss on case study of Microsoft Multinational Company Establishment. (10 Marks)
- OR
- 10 a. What do you mean by MSME? (02 Marks)
b. List out the characteristics of MSME. (08 Marks)
c. Define IPR and explain different forms of IPR. (10 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Computer Networks and Security

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Consider an ecommerce site that wants to keep purchase record for each of its customer. Describe how this can be done with cookies. (10 Marks)
- b. Describe in detail the services provided by DNS with neat diagram, explain the resolution of DNS query by DNS server with the help of iterative method. (10 Marks)

OR

- 2 a. Define HTTP. Explain with neat diagram the HTTP request and response method. (10 Marks)
- b. Illustrate how user 1 and user 2 can send and receive mail with the help of SMTP, POP, IMAP protocols. (10 Marks)

Module-2

- 3 a. With neat diagram, describe the various fields of UDP segment and with the help of an example explain how UDP will compute the clock sum. (10 Marks)
- b. With the help of FSM explain the operation of GBN protocol. (10 Marks)

OR

- 4 a. Explain with neat diagram, all the fields of a TCP segment. (07 Marks)
- b. Explain the following related to TCP connection management:
- i) Three way handshake (08 Marks)
 - ii) Closing of the TCP connection. (05 Marks)
- c. Write a note on pipelined protocols.

Module-3

- 5 a. With an example explain distance vector algorithm. (10 Marks)
- b. Mention the three differences between distance vector and link state protocols. (03 Marks)
- c. Explain about routing table by using rip protocol in a router. (07 Marks)

OR

- 6 a. With an example explain link state algorithm. (10 Marks)
- b. Explain with neat diagram, different hierarchy in OSPF router. (06 Marks)
- c. Write a note on comparison of Interior Gateway (IGP) and Exterior Gateway (EGP) protocol. (04 Marks)

Module-4

- 7 a. Explain the various stages of RSA algorithm also show the encryption and decryption process for $p = 3$ $q = 11$ $e = 7$ $M = 9$. (10 Marks)
- b. With neat diagram, explain DES algorithm and Feistel structure. (10 Marks)

OR

- 8 a. Apply RSA and encrypt and decrypt the following $a = 3$ $b = 11$ $e = 3$ $M = 9$. (07 Marks)
b. Write a short note on firewalls. (05 Marks)
c. Explain Diffie Hellman key exchange protocol and prove that two keys K_1 and K_2 are equal. (08 Marks)

Module-5

- 9 a. With neat diagram explain the working of CDN (Content Distribution Network). (07 Marks)
b. With neat diagram, explain HTTP streaming. (07 Marks)
c. Write a note on Audio and Video properties. (06 Marks)

OR

- 10 a. With neat diagram, explain the Session Initiation Protocol (SIP) and call establishment process. (10 Marks)
b. Explain UDP and DASH streaming. (10 Marks)

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CBCS SCHEME

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18CS53

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Database Management System

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. List out and discuss the main characteristics of the database approach and how it differs from traditional file systems. (10 Marks)
- b. What is the goal of three-schema architecture? How it is defined at different levels? (05 Marks)
- c. When will the recursive relationship be used? Explain it with some examples. (05 Marks)

OR

- 2 a. A university database contains information about professors (identified by a SSN) and courses (identified by a course ID). Each of the following situations concerns the relationship set between the teacher and the student. Draw an ER diagram for each situation (assuming that no further constraints hold).
- i) Professors can teach the same course over several semesters and each offering must be recorded.
- ii) Each professor teaches exactly one course.
- iii) Each professor teaches at least one course and some professors teach multiple courses.
- iv) Each professor teaches at least one course and some processors must teach all the courses. (10 Marks)
- b. What is the difference between logical and physical data independence? Which one is harder to achieve? Why? (05 Marks)
- c. Discuss the advantages that must to be utilized by the DBA. (05 Marks)

Module-2

- 3 a. Justify the following statements:
- i) Handling null values is difficult
- ii) Relations must have a key
- iii) Weak entities do not have their own key attributes. (06 Marks)
- b. Find the results of these expressions for the relational schema R and S.

R		
A	B	C
1	2	3
2	2	5
3	4	1
4	2	3

S		
C	D	E
1	2	4
3	4	1
5	1	6
4	2	3

i) $R \cup S$

ii) $R \cap S$

iii) $R - S$

iv) $R \bowtie S$

$R.A = S.C$

v) $R \bowtie_{R.A = S.C} S$

- c. How does SQL implement the entity integrity constraints of the relational data model? (10 Marks)
- (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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OR

- 4 a. How are the OUTER JOIN operations different from the INNER JOIN operations? (04 Marks)
- b. Outline the steps to convert the basic ER model to relational database scheme. (10 Marks)
- c. Consider the following tables:

Works (Pname, Cname, Salary)	Pname = Person Name
LIVES (Pname, Street, City)	Cname = Company Name
LOCATED-IN (Cname, City)	Mgrname = Manager Name
MANAGER (Pname, Mgrname)	

Write the SQL for the following:

- i) Find the names of the persons who live and work in same city.
- ii) Find the names of the persons whose salary is more than that all of the 'oracle' employees.
- iii) List the names of the people who work for the company 'Wipro' along with the city they live in. (06 Marks)

Module-3

- 5 a. Consider the following database:
 Employee (Name, SSN, address, salary, superssn, dno)
 DEPT (Dname, Dno, mgr_ssn)
 PROJECT (Pname, Pno, ploc, Dnum)
 WORKS_ON (ESSN, pno, Hours)
 DEPENDENT (ESSN, DepName, relationship).
 Write the SQL query for the following:
- i) For each project on which more than 2 employees work, retrieve the project no, project name and the number of employees who work on the project.
- ii) Retrieve the names of all employees who have 2 or more dependents.
- iii) Retrieve the names of all employees who do not have supervisors.
- iv) Retrieve name of each employee who work on all projects controlled by dept. No5.
- v) Create a view which can retrieve dept, Name, no of employees and total salary of the dept. (10 Marks)
- b. When are stored procedures useful? Give an example. (05 Marks)
- c. Explain the three-tier application architecture. (05 Marks)

OR

- 6 a. Explain SQL triggers with examples. (06 Marks)
- b. Explain various JDBC classes and interfaces available with the sample code. (06 Marks)
- c. Consider the database given in Q.No.5a. Write the SQL for the following:
- i) Retrieve the number of employees in 'CSE' department.
- ii) Retrieve the names of managers who do not have dependents.
- iii) Retrieve the names of employees who do not work on any project.
- iv) List the names of all employees who are directly supervised by 'Anil'. (08 Marks)

Module-4

- 7 a. Why should NULLs in a relation be avoided as far as possible? Discuss the problem of spurious tuples and how we may prevent it. (06 Marks)
- b. Consider the following for published books:
 Book (Btitle, author-name, Btype, Listprice, Author-Aff, publisher)
 Btitle → publisher, Btype
 Btype → listprice
 Author_name → author-aff
 What is the key?
 i) What normal form is the relation in? Explain your answer.
 ii) Apply normalization until you cannot decompose the relations further. State the reasons behind each decomposition. (08 Marks)
- c. Define 5NF. Why 5NF is also called as PJNF? (06 Marks)

OR

- 8 a. Consider the following decomposition for the relation schema R.
 Determine whether each decomposition has lossless join property with respect to F. Also determine which normal form each relation in the decomposition is in.
 $D = \{R_1, R_2, R_3, R_4, R_5\}$, $R_1 = \{A, B, C, D\}$, $R_2 = \{D, E\}$, $R_4 = \{F, G, H\}$, $R_3 = \{B, F\}$,
 $R_5 = \{D, I, J\}$, $F = \{(A, B) \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}\}$. (08 Marks)
- b. Discuss the purpose of Boyce-Codd normal form. Describe how BCNF differs from and is stronger than 3NF. Illustrate your answer with an example. (06 Marks)
- c. List and narrate the informal guidelines for a relational schema design. (06 Marks)

Module-5

- 9 a. Explain in detail the desirable properties of transactions. (06 Marks)
- b. Describe 2 phase locking techniques for concurrency control. (10 Marks)
- c. State and explain two-phase commit protocol. (04 Marks)

OR

- 10 a. Describe the 3 phases of the ARIES recovery method. (06 Marks)
- b. List the different deadlock prevention schemes. (06 Marks)
- c. Draw a state diagram and discuss the typical states that a transaction goes through during execution. (08 Marks)

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Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Automata Theory and Computability

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Construct the DFSM for the following languages :
 - (i) $L = \{W \mid W \in \{a,b\}^* \mid W \text{ does not contain the substring } aab\}$
 - (ii) $L = \{W \mid W \in \{a,b\}^* \text{ where } W \text{ ends either with } a \text{ or } b\}$
- b. Minimize the given Fig. Q1 (b) DFSM by applying min DFSM method.

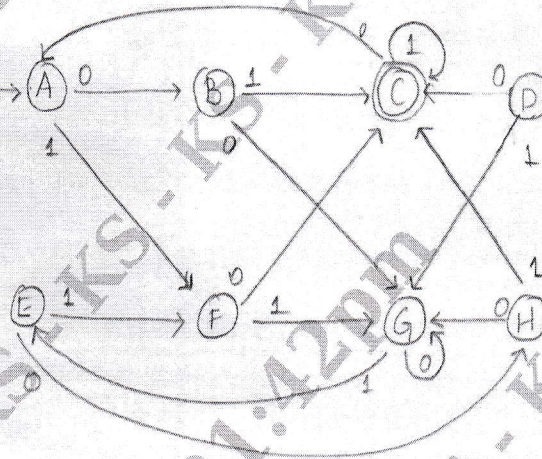


Fig. Q1 (b)

- c. Explain the operations on strings and languages.

OR

- 2 a. By applying ndfsm to dfsm convert the given Fig. Q2 (a) DFSM to its equivalent DFSM.

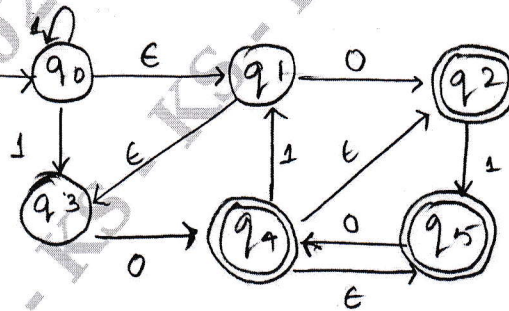


Fig. Q2 (a)

- b. Construct DFSM for the language,
 $L = \{W \mid W \in \{a,b\}^* \text{ where } W \text{ is having even number of } a\text{'s and odd number of } b\text{'s}\}$
- c. Explain the difference between DFSM and NDFS with example.

Module-2

- 3 a. Illustrate that the regular languages are closed under union, concatenation and compliment. (10 Marks)
- b. State and prove pumping Lemma for regular languages and prove that the following languages are not regular.
- (i) $L = \{a^n b^n \mid n \geq 0\}$
- (ii) $L = \{WW^R \mid W \in \{a, b\}^*\}$ (10 Marks)

OR

- 4 a. Consider the FSM M given in Fig. Q4 (a). Use the fsmto regx heuristic method to construct a regular expression that describe L(m). (08 Marks)

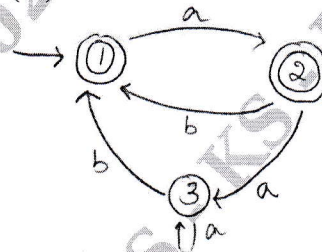


Fig. Q4 (a)

- b. Write the regular expression for the following languages ;
- (i) $L = \{a^{2n} b^{2m} \mid n \geq 0, m \geq 0\}$
- (ii) $L = \{a^n b^m \mid m \geq 1, n \geq 1, n + m \geq 3\}$
- (iii) $L = \{W \mid W \in \{a, b\}^* \text{ and } |W| \text{ is multiples of } 3\}$. (06 Marks)
- c. Draw a FSM for the given below regular expressions :
- (i) $(0+1)^* 0 (0+1)^* 0$
- (ii) $ab(a+b)^* a$ (06 Marks)

Module-3

- 5 a. Obtain a context free Grammar for the language :
- (i) $L = \{0^{2n} 1^m \mid n \geq 0, m \geq 0\}$
- (ii) $L = \{0^i 1^j 2^k \mid i = j \text{ or } j = k\}, i, j, k \geq 0$ (04 Marks)
- b. Convert the following CFG into CNF :
- $R = \{ A \rightarrow a \quad B \rightarrow b \mid bR$
 $A \rightarrow aB \quad C \rightarrow C \mid cC$
 $A \rightarrow BaC$
 $A \rightarrow BbC$
 $\}$ where A is the start symbol (06 Marks)
- c. Design a PDA to accept the language $L = \{a^n b^n \mid n \geq 0\}$, draw the transition diagram and show the string acceptance for W=aaabbb. (10 Marks)

OR

- 6 a. What is ambiguous grammar? Prove that the given grammar is ambiguous : $S \rightarrow (S) \mid SS \mid \epsilon$ (06 Marks)
- b. Design a PDA for the language $L = \{WCW^R \mid W \in \{a, b\}^*\}$ and draw the transition diagram and show the string acceptance for W = a a b c b a a. (10 Marks)

- c. Convert the following CFG to CNF

$$R = \{ \begin{array}{l} S \rightarrow XY \\ X \rightarrow A \\ A \rightarrow B/a \\ Y \rightarrow bT \\ T \rightarrow Y/C \\ \} \end{array}$$

(04 Marks)

Module-4

- 7 a. Design a Turing Machine to accept $L = \{0^n 1^n 2^n \mid n \geq 0\}$. Draw the transition diagram and show the moves made for the string $W = a a b b c c$. (10 Marks)
- b. Explain multitape Turing machine and prove that language accepted by multitape Turing machine is also accepted by singletape Turing machine. (10 Marks)

OR

- 8 a. Explain non-deterministic Turing machine and prove that there exists equivalent DTM. (10 Marks)
- b. Design a Turing machine for the language,
 $L = \{W \mid W \in \{a, b\}^* \text{ where } W \text{ is a string of palindrome of odd or even length}\}$.
 Draw the transition diagram. Show the string acceptance for $W = ababa$. (10 Marks)

Module-5

- 9 a. Explain post correspondence problem. (07 Marks)
- b. Explain Halting problem in Turing machine. (06 Marks)
- c. Explain recursively enumerable language. (07 Marks)

OR

- 10 Write short notes on : (20 Marks)
- a. Growth rate of function.
- b. Classes of P & NP
- c. Quantum computers.
- d. Church Turing Thesis

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Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024

Application Development using Python

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What is variable in program? Explain rules for declaring variable name. Explain with example. (05 Marks)
- b. Write types of operators in Python. Explain types of operators with examples. (07 Marks)
- c. Draw flowchart for if-else-ladder in python. Explain execution of if-else-statement with example. (08 Marks)

OR

- 2 a. Write syntax for defining function in Python. Explain function definition and function call in Python with the help of example. (05 Marks)
- b. What is scope of variable? Explain types of scopes of variable with examples. Explain use of 'global' keyword in Python. (07 Marks)
- c. Draw flowchart for while control statement in Python. Explain execution of while control statement with example. (08 Marks)

Module-2

- 3 a. Define list data type of Python. With example explain how positive and negative index can be used to access elements of list. (05 Marks)
- b. What is tuple data type in Python? With example explain difference between tuple and list data types. (07 Marks)
- c. Explain list data types index(), append(), insert() and remove() methods with examples. (08 Marks)

OR

- 4 a. How references are used in function call in Python. Explain copy module's copy() and deepcopy() functions with examples. (05 Marks)
- b. Define dictionary data type in Python. With example explain keys(), values(), items() methods of dictionary data type. (07 Marks)
- c. Explain following string methods with example: upper(), lower(), isupper(), islower(), startwith(), endswith(), join() and split(). (08 Marks)

Module-3

- 5 a. Explain following file related functions with examples open(), close(), read(), readline(), readlines(). (05 Marks)
- b. What is Shutil module? Explain how it is used for copying, moving and removing files and folders in Python. (07 Marks)
- c. With example explain different file opening modes in Python. (08 Marks)

OR

- 6 a. With example explain walking a directory tree in Python. (05 Marks)
b. Define a regular expression to extract phone number. Using this regular expression write a Python program to extract phone number. (07 Marks)
c. Write a Python program to create zip file and to extract zip file. Explain these programs with appropriate comment lines in the code. (08 Marks)

Module-4

- 7 a. What is inheritance? Write and explain Python code for inheritance. (05 Marks)
b. Explain object oriented features of Python. Explain --init()-- and --str-- methods in Python class object. (07 Marks)
c. Write and explain code for pure function and modifiers. (08 Marks)

OR

- 8 a. Explain type-based dispatch concept in Python with help of example. (05 Marks)
b. Define a time class. Write a Python program to set values to attributes of class and to display values of attributes of class. (07 Marks)
c. Explain following terms with examples: class, object, attribute, operator overloading. (08 Marks)

Module-5

- 9 a. Write a Python program to download web content and save in file. (05 Marks)
b. Write a Python program to create and save excel file. (07 Marks)
c. With example explain reader and writer objects of 'csv' module. (08 Marks)

OR

- 10 a. Explain how a 'run' object is used in paragraph object of the word file to read text. (05 Marks)
b. Explain pypdf2 module in Python. Write a Python code to encrypt pdf file and decrypt a pdf file. (07 Marks)
c. List and explain 'Run' object text attributes. Explain each attribute with example. (08 Marks)

CBCS SCHEME

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18CS56

Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 UNIX 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 with a neat block diagram, architecture of UNIX operating system. (08 Marks)
- b. What is a parent child relationship? With the help of neat diagram, explain UNIX file system. (06 Marks)
- c. Explain the commands to add, modify and delete a user. (06 Marks)

OR

- 2 a. List and explain the silent features of UNIX operating system. (08 Marks)
- b. What are internal and external commands in UNIX? Explain with any two examples in each type command used to identify whether command is internal or external command. (06 Marks)
- c. In brief explain the following commands with example :
i) car ii) mv iii) wc iv) od. (06 Marks)

Module-2

- 3 a. Using both relative and absolute methods of assigning permissions. Files current permissions are rw - - w - r - - . Write chmod expressions required to change them for the following :
i) r - - r - - - - x
ii) rwxrwx - - x
iii) r - xr - xr - x
iv) rwxrwxr - - . (08 Marks)
- b. Explain with example set and shift commands in UNIX to manipulate positional parameters. (06 Marks)
- c. With syntax and programming example explain while and for loops. (06 Marks)

OR

- 4 a. Which command is used for listening of file attributes? Explain the significance of each field. (08 Marks)
- b. Write syntax of grep command and explain any five options of grep command. (06 Marks)
- c. In detail discuss the three standard file supported by UNIX. (06 Marks)

Module-3

- 5 a. Explain with a neat diagram memory layout of a C program and briefly discuss the different functions used for memory allocation. (10 Marks)
- b. Explain the following general APIs along with syntax :
i) open ii) create iii) read iv) write v) close. (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.

OR

- 6 a. With a neat block diagram, explain how a C program is started and how it terminates. (10 Marks)
- b. Explain getrlimit and setrlimit function with prototype. (06 Marks)
- c. Define race condition. Write a 'C' program to demonstrate the race condition. (04 Marks)

Module-4

- 7 a. What are pipes? What are its limitations? Write a program to send data from parent to child over a pipe. (10 Marks)
- b. Briefly explain the semaphore. Explain following APIs with prototype : (10 Marks)
- i) semget() ii) semctl() iii) semop.

OR

- 8 a. What is a FIFO? Write uses of FIFO with a neat diagram, explain client server communication using FIFO. (08 Marks)
- b. Explain the following APIs with prototype : (08 Marks)
- i) Setreuid() and setregid()
- ii) System(). (04 Marks)
- c. Briefly explain job control.

Module-5

- 9 a. With a neat diagram, explain the BSD syslog facility daemon process. (10 Marks)
- b. Explain the following APIs with prototype : (10 Marks)
- i) Siprocmask
- ii) Sigaction.

OR

- 10 a. What are daemon process List the coding rules. (10 Marks)
- b. Explain the following APIs with prototype (10 Marks)
- i) Sigsetjmp and siglongjmp
- ii) Kill().
