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18CS51

Fifth Semester B.E. Degree Examination, July/August 2022
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. Explain different functions of management. **(10 Marks)**

b. Explain the general principles of administrative management theory as laid down by Henry fayol. **(10 Marks)**

OR

2 a. Explain the steps involved in planning. Mention the importance and purpose of planning process. **(10 Marks)**

b. Define Organization. Explain line and staff organization with its advantages and disadvantages. **(05 Marks)**

c. Define Selection. Explain the sources of Recruitment. **(05 Marks)**

Module-2

3 a. Define Motivation. Explain Herzberg's two factor theory to help a manager to motivate his sub-ordinates. **(10 Marks)**

b. Define Leadership. Explain various leadership styles. **(10 Marks)**

OR

4 a. Define Control. Explain the different methods of establishing control. **(10 Marks)**

b. Define co-ordination, what is the need for co-ordination? **(05 Marks)**

c. Explain the requirements of effective direction. **(05 Marks)**

Module-3

5 a. What are the different classifications of Entrepreneur? **(10 Marks)**

b. Explain Technical and market feasibility study. **(10 Marks)**

OR

6 a. Explain the role of entrepreneurs in economic development of India. **(10 Marks)**

b. Discuss the barriers of entrepreneurs. **(05 Marks)**

c. Discuss the differences between Entrepreneur, Intrapreneur and Manager. **(05 Marks)**

Module-4

7 a. Explain project Identification and project selection. **(10 Marks)**

b. Explain the following functional areas of management with respect to ERP.

i) Supply Chain Management **(05 Marks)**

ii) Human Resources. **(05 Marks)**

OR

8 a. Define ERP. Explain importance and characteristics of ERP. **(10 Marks)**

b. Explain the steps involved in formulation of project report. **(10 Marks)**

Module-5

9 a. Discuss the case study of NR Narayan Murthy (Infosys) and Captain G.R. Gopinath. **(10 Marks)**

b. Explain the steps in establishing micro and small enterprises. **(10 Marks)**

OR

10 a. Explain the following: i) NSIC ii) DIC iii) KSFC iv) KIADB v) TECSOK. **(10 Marks)**

b. Explain trademark, copyright and patents. **(10 Marks)**

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18CS52

Fifth Semester B.E. Degree Examination, July/August 2022
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. Explain the steps involved in transferring a web page from server to client in case of HTTP with non – persistent connection. Also brief the Back of the Envelope calculation for time needed to request and receive the file. **(10 Marks)**

b. Consider an e – commerce site that wants to keep a purchase record for each of its customers. Describe with neat diagram how this can be done with cookies. **(10 Marks)**

OR

2 a. Explain with neat diagram, the socket related activity of client – server communication over the TCP along with client and server code. **(10 Marks)**

b. Explain FTP with its Commands and Replies. **(10 Marks)**

Module-2

3 a. Describe the various fields of UDP segment structure. Suppose you have the following three 16 – bit words 0110011001100000 , 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 , 1000111100001100. Find the checksum. How does the receiver detect errors? Is it possible that 1 – bit errors will go undetected? **(10 Marks)**

b. Explain Sender and Receiver side Finite State Machine (FSM) representation for rdt 2.1 protocol. **(10 Marks)**

OR

4 a. Draw TCP Segment structure. Describe the various fields of TCP segment structure. **(10 Marks)**

b. Explain with neat diagram, the causes and costs of congestion considering the following scenarios.
Scenario 1 : Two sender , A Router , with Infinite Buffer.
Scenario 2 : Two sender , A Router , with Finite Buffer. **(10 Marks)**

Module-3

5 a. Write Link state Routing Algorithm. Apply it to the following graph [Refer Fig. Q5(a)] with source node as "U". Draw the least cost path tree and the forwarding table for node "U". **(10 Marks)**

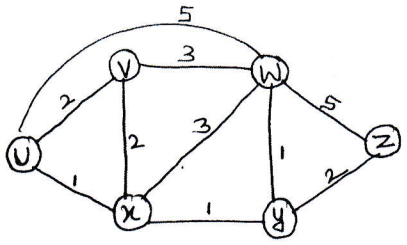


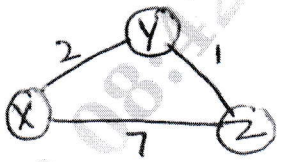
Fig. Q5(a)

b. Draw IPV4 datagram format. Mention the significance of each field. **(10 Marks)**

OR

6 a. Write distance Vector Routing Algorithm and apply it to the following graph. [Refer Fig. Q6(a)]. **(10 Marks)**

Fig. Q6(a)



b. Draw IPV6 datagram format. Mention the significance of each field. **(10 Marks)**

Module-4

7 a. Explain Diffie – Hellman Key Exchange Protocol. Suppose two parties A and B wish to set up a common secret key between themselves using Diffie Hellman Protocol selecting generator as 3 and prime number as 7. Party A chooses 2 and Party B chooses 5 as their respective secret. Find the Diffie Hellman Key. **(10 Marks)**

b. Explain Data Encryption Standard (DES) algorithm. **(10 Marks)**

OR

8 a. Explain three phases of RSA Algorithm. For an encryption of a 4 – bit message "1000" or M = 9 we choose a = 3 and b = 11. Find the Public and Private keys for this security action and show the Cipher text. **(10 Marks)**

b. Write short notes on :
   i) Security Implementation in wireless IEEE 802.11.
   ii) Firewalls. **(10 Marks)**

Module-5

9 a. Explain how DNS Redirects a User's request to a CDN Server. **(10 Marks)**

b. Explain RTP Basics and RTP packet Header fields. **(10 Marks)**

OR

10 a. Explain the properties of Audio and Video. Also mention the three key distinguishing features of Streaming Stored Video. **(10 Marks)**

b. With neat diagram, explain Session Initiation Protocol (SIP) Call establishment. **(10 Marks)**

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18CS53

Fifth Semester B.E. Degree Examination, July/August 2022
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. Discuss the advantages of using the DBMS approach. **(06 Marks)**

b. Explain three-schema architecture with a neat diagram. Why do we need mapping between schema levels? **(06 Marks)**

c. Explain the component modules of DBMS and their interaction with the help of a diagram. **(08 Marks)**

OR

2 a. Define the following terms:
(i) Weak entity (ii) DBMS catalog (iii) Snapshot
(iv) Value sets (v) Cardinality ratio (vi) Degree of a relationship **(06 Marks)**

b. Explain the different categories of data models. **(06 Marks)**

c. Write the ER diagram for an employee database. The constraints are as follows:
(i) An employee works for a department
(ii) Every department is headed by a manager
(iii) An employee works on one or more projects
(iv) An employee has dependents
(v) A department controls the projects **(08 Marks)**

Module-2

3 a. What is meant by Integrity Constriant? Explain the importance of referential integrity constraint. How referential integrity constraint is implemented in SQL. **(08 Marks)**

b. Write the relational algebra operations to perform the following queries:
(i) Retrieve the name and address of all employees who work for the "Accounts" department.
(ii) Retrieve the names of employers who have no dependents.
(iii) Find the names of employees who work on all the projects controlled by department number 2. **(06 Marks)**

c. Explain the relational algebra operations from Set theory, with examples. **(06 Marks)**

OR

4 a. Explain the ER to relational mapping algorithm with suitable example for each step. **(10 Marks)**

b. Write the SQL queries for the following database schema:
Student (USN, NAME, BRANCH, PERCENTAGE)
Faculty (FID, FNAME, DEPARTMENT, DESIGNATION, SALARY)
Course (CID, CNAME, FID)
Enroll (CID, USN, GRADE)
(i) Retrieve the names of all students enrolled for the course 'CS_54'
(ii) List all the departments having an average salary of the faculties above Rs.10,000.
(iii) List the names of the students enrolled for the course'CS_51' and having 'B' grade. **(06 Marks)**

c. Explain with examples in SQL: (i) INSERT command (ii) UPDATE command **(04 Marks)**

Module-3

5 a. How are assertions and triggers defined in SQL? Explain with examples. **(08 Marks)**

b. Explain stored procedures in SQL with an example. **(06 Marks)**

c. List out and explain the different types of JDBC drivers. **(06 Marks)**

OR

6 a. What is a three-tier architecture? What advantages it offer over single tier and two tier architectures? Give a short overview of the functionality at each of the three-tier. **(10 Marks)**

b. How to create views in SQL? Explain with an example. **(06 Marks)**

c. What is SQLJ? How it is different from JDBC? **(04 Marks)**

Module-4

7 a. Explain an informal design guidelines for relational schema design. **(08 Marks)**

b. What is the need for normalization? Explain 1NF, 2NF and 3NF with examples. **(08 Marks)**

c. What do you understand by attribute closure? Give an example. **(04 Marks)**

OR

8 a. What is functional dependency? Explain the inference rules for functional dependency with proof. **(08 Marks)**

b. Define 4NF. When it is violated? Why is it useful? **(06 Marks)**

c. Consider two sets of functional dependency $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$ and $G = \{A \rightarrow CD, E \rightarrow AH\}$. Are they equivalent? **(06 Marks)**

Module-5

9 a. Why concurrency control is needed? Demonstrate with an example. **(10 Marks)**

b. Discuss the UNDO and REDO operations and the recovery techniques that use each. **(06 Marks)**

c. Explain the ACID properties of a database transaction. **(04 Marks)**

OR

10 a. Discuss Two-Phase Locking Technique for concurrency control. **(10 Marks)**

b. When deadlock and starvation problem occur? Explain how these problems can be resolved. **(10 Marks)**

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18CS54

Fifth Semester B.E. Degree Examination, July/August 2022
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. Define the following terms with an example i) Alphabet ii) Power of an alphabet iii) String iv) String concatenation v) language. **(05 Marks)**

b. Explain the hierarchy of language classes in automata theory with diagram. **(05 Marks)**

c. Design DFSM for each of the following language.

i) $L = \{\omega \in \{0,1\}^* : \omega \text{ does not end in } 01\}$

ii) $L = \{\omega \in \{a,b\}^* : \text{every a in } \omega \text{ is immediately preceded and followed by b}\}$. **(10 Marks)**

OR

2 a. Use MiNDFSM algorithm to minimize M given in Fig Q2(a).

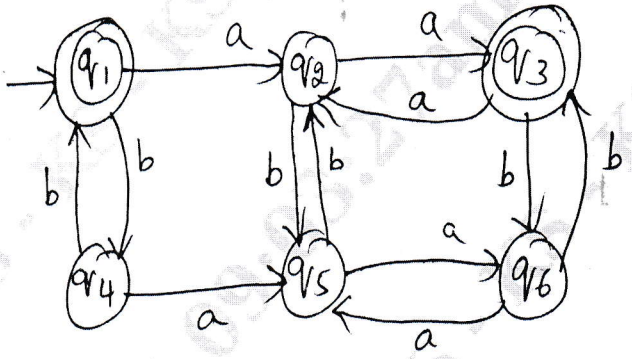

Fig Q2(a) **(08 Marks)**

b. Convert the following NDFSM given in Fig Q2(b) to its equivalent DFSM.

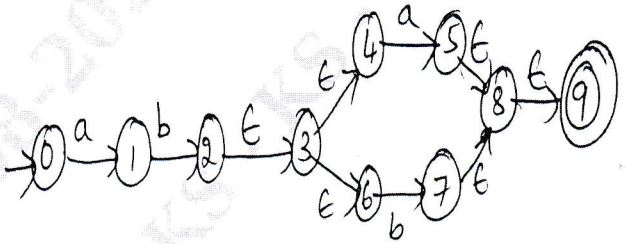

Fig Q2(b) **(08 Marks)**

c. Design a mealy machine that takes binary number as input and produces 2's complement of the number as output. **(04 Marks)**

Module-2

3 a. Define Regular expression. Write regular expression for the following language.

i) $L = \{0^n 1^m \mid m \geq 1, n \geq 1, mn \geq 3\}$

ii) $L = \{\omega \in \{a, b\}^* : \text{string with atmost one pair of consecutive a's}\}$ **(08 Marks)**

b. Obtain NDFSM for the regular expression $(a^* \cup ab)(a \cup b)^*$. **(05 Marks)**

c. Build a regular expression for the given FSM in Fig Q3(c).

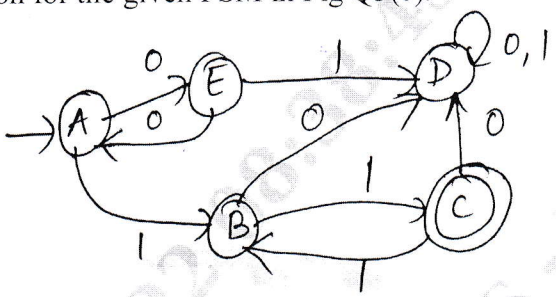

Fig Q3(c) **(07 Marks)**

OR

4 a. State and prove pumping Lemma theorem for regular language. **(08 Marks)**

b. Prove that regular languages are closed under complement. **(05 Marks)**

c. Write regular expression, regular grammer and FSM for the languages
$L = \{\omega \in \{a, b\}^* : w \text{ ends with pattern aaaa}\}$. **(07 Marks)**

Module-3

5 a. Define Context Free Grammer (CFG). Write CFG for the following languages
$L = \{0^m 1^m 2^n : m \geq 1, n \geq 0\}$. **(05 Marks)**

b. What is ambiguity in a grammar? Eliminate ambiguity from balanced parenthesis grammar? **(08 Marks)**

c. Simplify the grammar by removing productive and unreachable symbols
$S \rightarrow AB|AC$
$A \rightarrow aA\ b|\in$
$B \rightarrow bA$
$C \rightarrow bCa$
$D \rightarrow AB$ **(07 Marks)**

OR

6 a. Define PDA and design PDA to accept the language by final state method. **(07 Marks)**
$L(M) = \{\omega C \omega^R \mid \omega \in (a \cup b)^*$ and ω^R is reverse of $\omega\}$

b. Convert the following grammar to CNF
$S \rightarrow ASB|\in$
$A \rightarrow a\ AS|a$
$B \rightarrow SbS|A|bb$ **(08 Marks)**

c. Consider the grammar
$E \rightarrow E + E|E * E|(E)|id$
Construct LMD, RMD and parse tree for the string (id + id * id). **(05 Marks)**

Module-4

7 a. Define Turing Machine (TM). Design a TM for language
$L = \{0^n 1^n \mid n \geq 1\}$. Show that the string 0011 is accepted by ID. **(10 Marks)**

b. Explain multiple TM with a neat diagram. **(05 Marks)**

c. Explain any two techniques for TM construction. **(05 Marks)**

OR

8 a. Design a TM for the language $L = \{1^n 2^n 3^n \mid n \geq 1\}$ show that the string 11 2233 is accepted by ID. **(12 Marks)**

b. Demonstrate the model of Linear Bounded Automata (LBA) with a neat diagram. **(08 Marks)**

Module-5

9 a. Show that A_{DFA} is decidable. **(05 Marks)**

b. Define Post Correspondence Problem (PCP). Does the PCP with two list x = (b, bab^3, ba) y = (b^3, ba, b) have a solution. **(08 Marks)**

c. Explain quantum computation. **(07 Marks)**

OR

10 a. Prove the A_{TM} is undecidable. **(05 Marks)**

b. Does the PCP with two list x = (0, 01000, 01) y = (000, 01, 1) have a solution. **(05 Marks)**

c. State and explain Church Turning Thesis in detail. **(10 Marks)**

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18CS55

Fifth Semester B.E. Degree Examination, July/August 2022
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. List the salient features of Python Programming Language. **(06 Marks)**

b. List and explain the Syntax of all Flow control statements with example. **(08 Marks)**

c. Write a Python program to calculate the area of circle, rectangular and triangle. Print the results. **(06 Marks)**

OR

2 a. What is a Function? How to define a function in Python? Explain with suitable example. **(06 Marks)**

b. Explain Local and Global scope of variable in Python with example. **(08 Marks)**

c. What is Exception Handling? How Exceptions are handed in Python? Write a Python program with exception handling code to solve divide – by – zero error situation. **(06 Marks)**

Module-2

3 a. What is Lists? Explain the concept of list slicing with example. **(06 Marks)**

b. What is Dictionary? How it is different from List? Write a program to count the number of occurrences of character in a string. **(07 Marks)**

c. Write a Python program that accepts a sentence and find the number of words, digits, uppercase letters and lower case letters. **(07 Marks)**

OR

4 a. List out all the useful string methods which supports in Python. Explain with an example for each method. **(10 Marks)**

b. What is the difference between copy.copy ( ) and copy.deepcopy ( ) Function applicable to a list or Dictionary in Python? Give suitable examples for each. **(06 Marks)**

c. Write a Python to Swap cases of a given string

Input : Java
Output : jAVA. **(04 Marks)**

Module-3

5 a. What are Regular Expressions? What are the different steps to be follow to use a Regular Expression in Python. **(06 Marks)**

b. Describe the following with suitable Python code Snippet :

i) Greedy and Non Greedy Pattern Matching.

ii) findall ( ) method of Regex object. **(07 Marks)**

c. Write a Python program to extract Phone numbers and Email addresses using Regular Expressions. **(07 Marks)**

OR

6 a. How do we specify and handle Absolute Relative Path? **(08 Marks)**

b. Explain the File Reading / Writing process with suitable Python program. **(06 Marks)**

c. Write a Python program to create a folder PYTHON and under the hierarchy 3 files file1 , file2 and file3. Write the content in file1 as "VTU" and in file2 as "UNIVERSITY" and file3 content should be opening and merge of file1 and file2. Check out the necessary condition before write file3. **(06 Marks)**

Module-4

7 a. What is Class? How do we define a class in Python? How to instantiate the class and how class members are accessed? **(08 Marks)**

b. Write a Python program that uses datetime module within a class, takes a birthday as input and print users age and the Number of days , hours , minutes and seconds until their next birthday. **(07 Marks)**

c. Illustrate the concept of modifier with Python code. **(05 Marks)**

OR

8 a. Explain init and str method with an example Python program. **(08 Marks)**

b. What are Polymorphic functions? Explain with code Snippet. **(06 Marks)**

c. Illustrate the concept of Inheritance with example. **(06 Marks)**

Module-5

9 a. How do we download a file and save it to hard drive using request module? **(06 Marks)**

b. Write short notes on :
Creating , Copying and Rotating pages with respect to pdf. **(06 Marks)**

c. Explain Selenium's Web Drive method for Finding elements. **(08 Marks)**

OR

10 a. Write a program that takes a Number N from command line and creates an N × N Multiplication table in Excel Spread Sheet. **(10 Marks)**

b. What is CSV and JSON Files? Explain with an example, Program the usage of Json Module in Python. **(10 Marks)**

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18CS56

Fifth Semester B.E. Degree Examination, July/August 2022
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 Unix architecture with neat diagram. (09 Marks)
b. Explain the salient features of Unix operating system. (07 Marks)
c. Explain the following commands : (i) date (ii) echo (04 Marks)

OR

2 a. Explain three categories of files in unix. (06 Marks)
b. What are internal and external commands in unix? Explain them with example. (06 Marks)
c. Explain the following commands with syntax and example,
(i) cat (ii) mv (iii) wc (iv) mkdir (08 Marks)

Module-2

3 a. Discuss the significance of the seven fields of ls - l command. (09 Marks)
b. Explain three standard file and redirection in unix. (06 Marks)
c. Explain grep command with example. (05 Marks)

OR

4 a. What are file permission? Illustrate the different ways of setting the file permission. (10 Marks)
b. Explain shell interpreter cycle with flowchart. (05 Marks)
c. Explain for and while control statements in shell script with example. (05 Marks)

Module-3

5 a. Explain the following API's with prototype (i) open (ii) fcntl (10 Marks)
b. Explain the fork and v-fork system call. How fork system call differs from v-fork? (10 Marks)

OR

6 a. With neat sketch, explain memory layout of C program. (10 Marks)
b. Explain the setjmp( ) and longjmp ( ) functions with an example C/C++ program. (10 Marks)

Module-4

7 a. What are pipes? Explain different ways to view a half-duplex pipe. Write a C/C++ program to send data from parent process to child process using pipes. (10 Marks)
b. What is FIFO? With a neat diagram, explain the client-server communication using FIFO. (10 Marks)

OR

8 a. Write a note on: (i) Process Accounting (ii) Process Time (10 Marks)
b. Explain briefly with example : (i) Message Queue (ii) Semaphore (10 Marks)

Module-5

9 a. What are daemon process? Mention and explain coding rules of daemon process. (10 Marks)
b. Explain kill( )API and alarm( )API. (10 Marks)

OR

10 a. Define signal. Explain Sigaction API with demonstrating program. (10 Marks)
b. What is error logging? With a neat block diagram, discuss the error login facility in BSD. (10 Marks)

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