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18CS51

Fifth Semester B.E. Degree Examination, Feb./Mar. 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. What is Management according to George. R. Terry? Mention and explain the Functional areas of Management. (10 Marks)

b. Explain the features of System's approach in Management. (06 Marks)

c. Explain the different levels of Management. (04 Marks)

OR

2 a. What is Planning? Explain the importance of Planning. (05 Marks)

b. Mention and explain the features , benefits and drawbacks of matrix organizational structure. (08 Marks)

c. Explain the steps involved in the Selection process. (07 Marks)

Module-2

3 a. Define Leadership. Give the differences between Autocratic , Participative and Free rein Leadership styles. (07 Marks)

b. What is Motivation? Give the importance of Motivation. Explain Herzberg's two factor theory. (08 Marks)

c. What is Communication? Give the differences between Formal and informal communication. (05 Marks)

OR

4 a. What is Co-ordination? Explain the requisites of effective co-ordination. (06 Marks)

b. Define Controlling. Explain the steps involved in the Controlling Process. (10 Marks)

c. Explain the benefits of Controlling. (04 Marks)

Module-3

5 a. Define Entrepreneurship. Explain the role of Entrepreneurs in Economic development. Explain the barriers to Entrepreneurship. (10 Marks)

b. Explain the different ways of Identifying business opportunities. (10 Marks)

OR

6 a. Mention the importance of Entrepreneurship. (05 Marks)

b. Explain the features of following types of Entrepreneurs : i) Drone Entrepreneur ii) Business Entrepreneur iii) Non – Technical Entrepreneur iv) Intrapreneur. (08 Marks)

c. Mention and explain the stages in Entrepreneurial process. (07 Marks)

Module-4

7 a. What is Project? Explain the different ways of Project Identification and Project selection. (10 Marks)

b. What is Project Report? What are the significances of Project report? Explain the planning commission guidelines for preparing a project report. (10 Marks)

OR

8 a. What is Enterprise Resource Planning? Give the advantages of ERP. **(06 Marks)**

b. Give the features of the following ERP Software's :
i) Human Resource Management System ii) Financial Management System. **(08 Marks)**

c. Explain briefly steps involved in Report writing. **(06 Marks)**

Module-5

9 a. Define MSME. List the characteristics and advantages of MSME. **(08 Marks)**

b. Explain Indian Industrial Policy 2007 on MSME. **(07 Marks)**

c. Write a case study of Captain G.R. Gopenath. **(05 Marks)**

OR

10 a. Give the facilities provided to Entrepreneurs by the following Institutions :
i) KIADB ii) KSFC iii) DIC. **(12 Marks)**

b. What are Intellectual Property Right? Briefly explain the main forms of Intellectual Property Rights. **(08 Marks)**

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18CS52

Fifth Semester B.E. Degree Examination, Feb./Mar. 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. Differentiate between :
(i) HTTP and FTP (ii) SMTP and HTTP (iii) UDP and TCP (10 Marks)
b. Explain Cookies and Web Caching with diagram. (10 Marks)

OR

2 a. Describe in detail the services offered by DNS and explain DNS message format. (08 Marks)
b. Compare HTTP and SMTP. (04 Marks)
c. Define Socket. Demonstrate the working of TCP-Socket. (08 Marks)

Module-2

3 a. With the help of FSM, describe the two states of the sender side and one state of the receiver side of rdt2.0 (10 Marks)
b. With a neat diagram, demonstrate the working of Go-BACK-N protocol. (10 Marks)

OR

4 a. Describe TCP connection management with help of diagram. (10 Marks)
b. Interpret the FSM to TCP congestion control. (10 Marks)

Module-3

5 a. Explain the Implementation of virtual circuit services in Computer Network. (07 Marks)
b. Explain the three Switching Techniques. (06 Marks)
c. Explain Distance vector algorithm using three nodes network. (07 Marks)

OR

6 a. Explain Dijkstra's algorithm with example. (10 Marks)
b. Explain various broadcast routing algorithms. (10 Marks)

Module-4

7 a. Explain Feistel structure of DES Algorithm. (10 Marks)
b. Explain RSA Algorithm with an example. (10 Marks)

OR

8 a. In the Diffie - Hellman key exchange protocol prove that the two keys k_1 and k_2 are equal. (10 Marks)
b. Discuss the following :
(i) Secure Hash Algorithm (ii) Firewalls. (10 Marks)

Module-5

9 a. Explain briefly how DNS redirects a users request to a CDN server. (10 Marks)
b. With neat diagram explain the naïve-architecture for audio/video streaming. (10 Marks)

OR

10 a. Write a short notes on :
(i) Netflix video streaming platform (ii) VOIP with Skype. (10 Marks)
b. With neat diagram explain the RTP header fields. (10 Marks)

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18CS53

Fifth Semester B.E. Degree Examination, Feb./Mar. 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. List and discuss advantages of Database Management System over File Processing System. **(06 Marks)**

b. Explain three Schema Architecture and reason for need of mapping among schema level. **(08 Marks)**

c. Explain different types of attributes that occur in an E – R diagram model with example. **(06 Marks)**

OR

2 a. Explain characteristics of the Database approach. **(06 Marks)**

b. Discuss the different types of User friendly interfaces. **(06 Marks)**

c. Draw an ER diagram for an AIRLINES database schema with atleast five entities. Also specify primary key and structural constraints. **(08 Marks)**

Module-2

3 a. What are the basic operations that can change the states of relations in the database? Explain how the basic operations deal with constraints violations. **(06 Marks)**

b. Explain the terms Super key , Candidate key and Primary key. **(04 Marks)**

c. Given the following schema :
emp (fname, Lname , SSN , Bdate, address, gender , salary , superSSN , Dno)
dept (Dname , Dnumber , MgrSSN , mgrstartdate)
dept_loc (Dnumber , Dloc)
project (Pname, Pnumber, Ploc, Dnum)
works_on (ESSN, Pno , hours)
Dependent (ESSN , dependent _ name, gender , bdate , relationship)
Give the relation algebra expression for the following :
i) Retrieve the name of the manager of each department.
ii) For each project retrieve the project number , project name and number of employee who worked on that project.
iii) Retrieve the names of employees who work on all the project controlled by department 5.
iv) Retrieve the name of employees who have no dependents.
v) Retrieve number of Male and Female employee working in the Company. **(10 Marks)**

OR

4 a. Describe the steps of an algorithm for ER to Rational mapping with example. **(06 Marks)**

b. Write command that is used for table creation. Explain how constraints are specified in SQL during table creation, with suitable example. **(04 Marks)**

c. Given the following schema
Emp (Fname, Lname , SSN , bdate , address, gender, salary , superSSN , dno)
dept (dname , dnumber, mgrSSN , mgrstartdate)
dept_loc (dnumber, dloc)
project (Pname, Pnumber, Ploc , dnum)
works_on (ESSN, Pno, hours)
dependent (ESSN , dependent_name, gender, bdate, relationship)
Give the relation algebra expression for the following :
i) Retrieve the name and address of all employees who work for 'sports' department.
ii) Retrieve each department number, number of employers and their average salary.
iii) List the project number, controlling department number and department manager's last name , address and birthdate.
iv) Retrieve the name of employees with 2 or more dependents.
v) List female employees from dno = 20 earning more than 50000. **(10 Marks)**

Module-3

5 a. Define Database stored procedure. Explain creating and calling stored procedure with example. **(06 Marks)**

b. What is SQLJ and how is it different from JDBC? **(06 Marks)**

c. Consider the following schema :
Sailors (Sid , Sname , rating , age)
Boats (bid, bname, color)
Reservers (Sid , bid , day)
Write queries in SQL
i) Find the ages of sailors whose name begins and ends with A and has atleast three characters.
ii) Find the age of the youngest sailor who is eligible to vote (i.e. is atleast 18 years old) for each rating level with atleast two such sailors.
iii) Find the names of sailors who have not reserved a red boat. (use nested query).
iv) Compute increments for the rating of persons who have sailed two different boats on the same day. **(08 Marks)**

OR

6 a. What is CGI? Why was CGI introduced? What are the disadvantages of an architecture using CGI script? **(06 Marks)**

b. What is Dynamic SQL and how is it different from embedded SQL? Explain. **(06 Marks)**

c. Consider the following schema :
Sailors (Sid, Sname, rating , age)
Boats (bid, bname, color)
Reserves (Sid, bid, day).
Write queries in SQL.
i) Find the names of sailors who have reserved at least one boat.
ii) Find sailors whose rating is better than some sailors called 'Jennifer'. (Use nested query)
iii) Find the average age of sailor for each rating level that at least two sailors.
iv) Find the name and age of the oldest sailor. **(08 Marks)**

Module-4

7 a. Which normal form is based on 6 transitive functional dependencies and full functional dependency? Explain the same with example. **(08 Marks)**

b. A relation R satisfies the following : FDS : $A \rightarrow C$, $AC \rightarrow D$, $E \rightarrow AD$, $E \rightarrow H$. Find the cover for this set of FDS. **(06 Marks)**

c. Consider the universal relation : R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies. F = {$AB \rightarrow C$, $A \rightarrow DE$, $B \rightarrow F$, $F \rightarrow GH$, $D \rightarrow IJ$}. Determine whether each decomposition has the loss less join property with respect to F. $D_1 = \{R_1, R_2, R_3\}$; $R_1 = \{A, B, C, D, E\}$; $R_2 = \{B, F, G, H\}$; $R_3 = \{D, I, J\}$. **(06 Marks)**

OR

8 a. Write an algorithm to check whether decomposed relations are in 3NF with dependency preservation and non – additive join property. Consider universal relation R = (U, C, L, A) and the set of functional dependencies. F = {$P \rightarrow LCA$, $LC \rightarrow AP$, $A \rightarrow C$}. Decompose the relation R into 3NF with dependency preservation and non – additive join property. **(06 Marks)**

b. Define Normal Form. Explain 1NF, 2NF and 3NF with suitable examples for each. **(08 Marks)**

c. Consider two set of functional dependencies 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. What are the anomalies occur due to interleave execution? Explain them with example. **(08 Marks)**

b. Explain different types of locks used in concurrency control. **(06 Marks)**

c. Explain how shadow paging helps to recover from transaction failure. **(06 Marks)**

OR

10 a. Explain ACID property of transaction and system log. **(06 Marks)**

b. When deadlock and starvation problem occurs? Explain how these problems can be resolved. **(06 Marks)**

c. Explain ARIES recovery algorithm with example. **(08 Marks)**

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Fifth Semester B.E. Degree Examination, Feb./Mar. 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 examples :
i) Alphabet   ii) String   iii) Language   iv) Concatenation at Languages
v) Power of an Alphabet. **(10 Marks)**

b. Define DFSM. Design DFSM
i) To accept strings having Even number of a's and even number b's
ii) To accept binary numbers divisible by 5. **(10 Marks)**

OR

2 a. Convert the following NDFSM of DFSM. [Refer Fig Q2(a)].

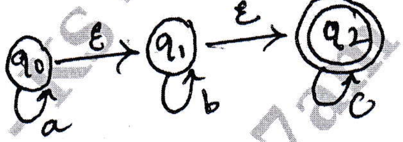

Fig Q2(a) **(08 Marks)**

b. Minimize the following DFSM by indentifying Distinguishable and Non-distinguishable states.

δ	0	1
→ A	B	F
B	G	C
* C	A	C
D	C	G
E	H	F
F	C	G
G	G	F
H	G	C

(12 Marks)

Module-2

3 a. Define Regular Expression. Write RE for the following Languages. **(10 Marks)**
i) Strings of 0's and 1's ending with three consecutive zeroes.
ii) Strings of a's and b's having substring aa.

b. Write DFSM to accept intersection of Languages $L_1 = (a + b)^*a$ and $L_2 = (a + b)^*b$ **(10 Marks)**

OR

4 a. Using Kleen's theorem, prove that for any Regular Expression R, their exits a finite automata $M = (Q, \Sigma, \delta, q_0, F)$ which accepts L(R). **(10 Marks)**

b. State and prove pumping Lemma for Regular Languages. Show that the Language $L = \{ww^r : w \in (0, 1)^*\}$ is not regular. **(10 Marks)**

Module-3

5 a. Define Context Free Grammar. Design CFG for the following Languages.
i) $L_1 = \{w : |w| \text{ Mod } 3 = 0\}$ over $\Sigma = \{a\}$
ii) $L_2 = \{a^n b^m c^k : m = n + k\}$ over $\Sigma = \{a, b, c\}$ **(10 Marks)**

b. Define Ambiguity. Consider the grammar
$E \rightarrow E + E \mid E * E \mid (E) \mid id$
Find Leftmost and Rightmost derivations and parse tree for the string id + id * id, show that the grammar is ambiguous. **(10 Marks)**

OR

6 a. What is Chomsky Normal Form of CFG? Convert the following grammar to CNF.
$S \rightarrow ABC \mid BaB$
$A \rightarrow aA \mid BaC \mid aaa$
$B \rightarrow bBb \mid a \mid D$
$C \rightarrow CA \mid AC$
$D \rightarrow \varepsilon$
Eliminate ε - productions, Unit productions and useless symbols if any before conversion. **(10 Marks)**

b. What is NPDA? Design NPDA for Language $L = \{a^n b^n \mid n \geq 1\}$. Draw transition diagram. Write sequence of moves made by NPDA to accept the string aaabbb. **(10 Marks)**

Module-4

7 a. Design TM for WCW^R over $\Sigma = \{0, 1\}$. Write transition diagram, and ID for w = 101C101 **(14 Marks)**

b. Explain : i) Multitape ii) Non-deterministic TM **(06 Marks)**

OR

8 a. Define Turning Machine. Explain the working of Turning Machine. **(06 Marks)**

b. Design Turning machine to accept the Language $L = \{0^n 1^n 2^n \mid n >= 0\}$. Draw the transition diagram. Write sequence of moves made by TM for string 001122. **(14 Marks)**

Module-5

9 a. Explain Halting problem in Turning machine. **(07 Marks)**
b. Write applications of Turning Machine. **(06 Marks)**
c. Explain Recursively Enumerable Languages. **(07 Marks)**

OR

10 a. Explain Quantum Computers. **(07 Marks)**
b. Explain P and NP classes. **(07 Marks)**
c. Explain Church Turning Thesis. **(06 Marks)**

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18CS55

Fifth Semester B.E. Degree Examination, Feb./Mar. 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. Write a Python program to calculate the area and circumference of a circle Input the value of radius and print the results. **(06 Marks)**

b. Explain with example code snippets, different syntax of range( ) function in Python. **(06 Marks)**

c. Discuss local and global scope of variables in Python. Illustrate different scenarios, with an example. **(08 Marks)**

OR

2 a. Demonstrate the use of break and continue keywords using a code snippet. **(06 Marks)**

b. List and define the use of comparison operators in Python. Write the output for the following expression in Python:
i) 2 * * 3 ii) 20% 6 iii) 20//6 **(06 Marks)**

c. What is user defined function? Write a function to check if a given number is a prime or not. **(08 Marks)**

Module-2

3 a. What is a List? Explain the methods that are used to delete items from the list. **(08 Marks)**

b. Write a program to take a sentence as input and display the longest word in the given sentence. **(06 Marks)**

c. How is the dictionary different from list? Assume a dictionary containing city and population as key and value respectively. Write a program to traverse the dictionary and display most populous city. **(06 Marks)**

OR

4 a. Explain the following string methods with example:
i) join( ) ii) islower( ) iii) strip( ) iv) center( ). **(08 Marks)**

b. Write a program to create a list of number and display the count of even and odd numbers in the list. **(06 Marks)**

c. If S = 'Hello World', explain and write the output of the following statements:
i) S[1:5] ii) S[:5] iii) S[3: - 1] iv) S[:] **(06 Marks)**

Module-3

5 a. What is a regular expression? Explain the process of finding patterns of text with regular expressions and associated methods in Python with an example. **(08 Marks)**

b. Explain the following patterns matching capabilities in python with suitable program snippets:
i) Grouping with parentheses
ii) Matching multiple groups
iii) Matching one or more. **(06 Marks)**

c. Explain the following file operations in Python with suitable examples:
i) Copying files and folders
ii) Moving files and folders
iii) Permanently deleting files and folders. **(06 Marks)**

OR

6 a. Explain with a suitable Python program how findall( ) is different from search( ) method. State the purpose of any four short hand character classes with examples. **(08 Marks)**

b. What is the difference between OS and OS.path modules? Discuss the following four methods of OS module:
i) chdir( ) ii) walk( ) iii) listdir( ) iv) getcwd( ) **(06 Marks)**

c. With code snippets, explain reading, extracting and creating ZIP files in Python. **(06 Marks)**

Module-4

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

b. Write a Python program to add and multiply two complex number objects using operator overloading concepts. **(06 Marks)**

c. Discuss type-based dispatch in a Python. **(06 Marks)**

OR

8 a. Explain __init__ and __str__ methods, with an example. **(08 Marks)**

b. What is pure function? Illustrate the same with an example. **(06 Marks)**

c. Explain concept of polymorphism with suitable example. **(06 Marks)**

Module-5

9 a. What is Web Scraping? Explain the process of downloading the file from web and saving downloaded files. **(08 Marks)**

b. Explain the process of reading cells from EXCEL sheets. **(06 Marks)**

c. With a code snippet, discuss how to change the text style of .doc file using paragraph and run objects. **(06 Marks)**

OR

10 a. How do we extract, decrypt, copy and encrypt PDF files in Python. **(08 Marks)**

b. Discuss the process of creating a beautiful soup object and finding an element from HTML. **(06 Marks)**

c. With an example, illustrate the use of JASON module in Python. **(06 Marks)**

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18CS56

Fifth Semester B.E. Degree Examination, Feb./Mar. 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 the architecture of UNIX Operating System. (10 Marks)

b. Explain the following commands :
i) printf ii) passwd iii) date iv) who. (10 Marks)

OR

2 a. Explain features of UNIX. (10 Marks)

b. Explain basic file types in UNIX. What is relative and absolute pathname? (10 Marks)

Module-2

3 a. Interpret the significance of ls -l command redirection. (10 Marks)

b. Explain 3 standard redirection files with respect to UNIX OS. (10 Marks)

OR

4 a. Explain changing file permissions in absolute and relative manner. (10 Marks)

b. Define Shell Script. Write menu driven shell script which displays :
i) Currents users of system ii) List of files iii) Today's date
iv) Process status v) Contents of a file. (10 Marks)

Module-3

5 a. What is the advantage of locking files? Explain mandatory and advisory locks. Why advisory lock is considered safe? What are the drawbacks of advisory lock? Explain. (12 Marks)

b. Explain exec functions with program. (08 Marks)

OR

6 a. Discuss how a C program is started and terminated in various ways along with suitable diagram. (10 Marks)

b. Write a C/C++ program using setjmp and longjmp to show their effect on various variables. (10 Marks)

Module-4

7 a. What is Stream Pipe? Explain it with program. How Stream pipe is better than pipe? (10 Marks)

b. Explain the implementation of system with its prototype. (10 Marks)

OR

8 a. Define Message queue. Discuss how it is useful in IPC. (10 Marks)

b. What are Pipes? What are its limitations? Write a program to send data from parent to child over a pipe. (10 Marks)

Module-5

9 a. Discuss how error logging is done by daemon process with suitable diagram. (10 Marks)

b. Discuss the working of sigprocmask API. Explain all parameters of API with program. (10 Marks)

OR

10 a. What is Daemon process? Explain coding rules and error logging. (10 Marks)

b. Explain the prototypes of following APIs :
i) Signal ii) Kill iii) alarm iv) sigaction. (10 Marks)

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