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18CS51

Fifth Semester B.E. Degree Examination, July/August 2021
Management and Entrepreneurship for IT Industry

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions.

1	a.	Define management. Explain characteristics of management.	(10 Marks)
	b.	Describe the steps involved in the process of planning.	(10 Marks)
2	a.	Define selection. Discuss the steps involved in the process selection.	(10 Marks)
	b.	Explain the principles of organization.	(10 Marks)
3	a.	Define leadership. Briefly explain types of leadership styles.	(10 Marks)
	b.	Define motivation. Mention motivation theories. Explain Herzberg's two factor theory.	(10 Marks)
4	a.	Define controlling. Discuss steps involved in controlling.	(10 Marks)
	b.	Explain the technique of co-ordination.	(10 Marks)
5	a.	Define Entreprenur. What are the characteristics of an Entreprenur?	(10 Marks)
	b.	Explain the barriers to Entreprenurship.	(10 Marks)
6	a.	What are the roles of Entrepreneurship in Economic development?	(10 Marks)
	b.	Discuss technical feasibility and market feasibility study.	(10 Marks)
7	a.	How do you identify a project? Enumerate the criteria for selection of a particular project.	(10 Marks)
	b.	Explain the guidelines provided by planning commission for preparation of project report.	(10 Marks)
8	a.	What is Enterprise Resource Planning (ERP)? Why ERP is important to a company.	(10 Marks)
	b.	Explain types of project reports.	(10 Marks)
9	a.	Explain the characteristics of Small Scale Industry.	(10 Marks)
	b.	Explain the following (i) KSFC (ii) NSIC (iii) DIC	(10 Marks)
10	a.	Explain the role of Small Scale Industry.	(10 Marks)
	b.	What are Intellectual Property Rights? Briefly explain the main forms of IPR.	(10 Marks)

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18CS52

Fifth Semester B.E. Degree Examination, July/August 2021
Computer Networks and Security

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions.***

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.

1 a. Describe HTTP with persistent and non-persistent connections. **(10 Marks)**
b. Write a note on web caching. **(05 Marks)**
c. Explain SMTP with example. **(05 Marks)**

2 a. Define a Socket. Describe the socket programming using TCP. **(10 Marks)**
b. Describe in detail the services provided by DNS and explain the DNS message format. **(10 Marks)**

3 a. Illustrate TCP and UDP segment structure with a help of diagram. **(10 Marks)**
b. With an FSM, explain the three phases of congestion control. **(10 Marks)**

4 a. Explain the stop and wait protocol with FSM representation rdt2.1. **(10 Marks)**
b. Explain the concept of transport layer multiplexing and De-Multiplexing. **(10 Marks)**

5 a. What is routing? Explain the structure of router. **(10 Marks)**
b. Explain 1PV4 datagram format with neat diagram. **(10 Marks)**

6 a. Explain Dijkstra's algorithm with example. **(10 Marks)**
b. Discuss the 1PV6 packet format. **(06 Marks)**
c. List the broadcast routing algorithms. Explain any one of them. **(04 Marks)**

7 a. Explain four types of internet infrastructure attacks in Network security. **(10 Marks)**
b. What is secret-key encryption protocols? Explain DES algorithm. **(10 Marks)**

8 a. Discuss the secure Hash Algorithm. **(05 Marks)**
b. Explain IP security and 1Psec. **(05 Marks)**
c. Explain RSA Algorithm. Using RSA algorithm encrypt a message M = 9. Assume p = 3 and q = 11. Find public and private keys and also show the cipher text. **(10 Marks)**

9 a. List the categories of streaming stored video. Explain one of them. **(10 Marks)**
b. Bring out the leaky bucket mechanism for traffic policing. **(10 Marks)**

10 a. Write a short notes on:
i) Netflix video streaming platform
ii) VOIP with skpe. **(10 Marks)**
b. Explain the types of multi media network applications. **(10 Marks)**

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18CS53

Fifth Semester B.E. Degree Examination, July/August 2021
Database Management Systems

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions.

1 a. List and briefly explain the characteristics of database approach. **(08 Marks)**
b. Define a data model. Discuss the main categories of data model with examples. **(08 Marks)**
c. Explain the different types of end users with examples. **(04 Marks)**

2 a. What are the advantages of using DBMS? Briefly explain them. **(08 Marks)**
b. Describe the three-schema architecture. Why do we need mapping between schema levels? **(06 Marks)**
c. List and explain the different types of attributes with examples. **(06 Marks)**

3 a. Define the following with examples:
(i) Super key
(ii) Candidate key
(iii) Primary key
(iv) Foreign key **(08 Marks)**
b. Summarize the steps involved in converting the ER constructs to relational schemas. **(06 Marks)**
c. Explain the various inner join operations in relational algebra with examples. **(06 Marks)**

4 a. Describe the six clauses in the syntax of an SQL retrieval query. **(06 Marks)**
b. How the aggregate functions and grouping are specified in relational model? Explain. **(06 Marks)**
c. Consider the following schemas :
SAILOR (SID, SNAME, RATING, AGE)
BOAT (BID, BNAME, COLOR)
RESERVE (SID, BID, DAY)
Specify the following queries in relational algebra:
(i) Retrieve the sailor names that have reserved red and green boats.
(ii) Retrieve the colors of boats reserved by Raj.
(iii) Retrieve the SIDs of sailors with age over 20, who have not reserved a red boat.
(iv) Retrieve the names of sailors who have reserved all boats. **(08 Marks)**

5 a. Explain the schema change statements in SQL with examples. **(06 Marks)**
b. What are views? Explain the specification and implementation of views in SQL. **(08 Marks)**
c. Describe the concept of cursor and how it is used in embedded SQL. **(06 Marks)**

6 a. With a neat diagram, explain the Three-Tier architecture and the technology relevant to each tier. What are the advantages of Three-Tier architecture? **(08 Marks)**
b. How are triggers and assertions specified in SQL? Explain with examples. **(06 Marks)**
c. What is dynamic SQL? How it differs from embedded SQL? **(06 Marks)**

7 a. Discuss the informal design guidelines for relation schemas with examples. **(08 Marks)**

b. Explain first, second and third normal forms with examples. **(06 Marks)**

c. What is functional dependency? Write an algorithm to find a minimal cover for a set of functional dependencies. **(06 Marks)**

8 a. Which normal form is based on the concept of transitive functional dependency? Explain the same with an example. **(06 Marks)**

b. State and prove the inference rules for functional dependencies. **(06 Marks)**

c. Define multivalued dependency. Explain 4NF with examples. **(08 Marks)**

9 a. What are the anomalies due to interleaved execution of transactions? Explain with examples. **(08 Marks)**

b. Define locking protocol. Describe the strict Two Phase Locking (2PL) protocol. **(06 Marks)**

c. Explain the three phases of the ARIES recovery technique. **(06 Marks)**

10 a. With a neat diagram, explain the typical states that a transaction goes through during execution. **(08 Marks)**

b. Discuss the problems of dead lock and starvation and the different approaches to dealing with these problems. **(06 Marks)**

c. Illustrate with precedence graph, which of the following schedules is conflict serializable:

(i) $R_1(X)$; $R_3(X)$; $W_1(X)$; $R_2(X)$; $W_3(X)$;

(ii) $R_3(X)$; $R_2(X)$; $W_3(X)$; $R_1(X)$; $W_1(X)$; **(06 Marks)**

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18CS54

Fifth Semester B.E. Degree Examination, July/August 2021
Automata Theory and Computability

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions.***

1 a. Define the following terms with examples alphabet, powers of an alphabet string, string concatenation and languages. **(10 Marks)**

b. Define DFSM. Design a DFSM to accept each of the following languages:

i) $L = \{W \in \{0.1\}^* : W \text{ is ending with } 011\}$

ii) $L = \{W \in \{0.1\}^* : W \text{ has odd numbers of a's and even numbers of b's}\}$ **(10 Marks)**

2 a. Convert the following NDFSM to DFSM:

δ	ε	a	b	c
→p	ϕ	{p}	{q}	{r}
q	{p}	{q}	{r}	ϕ
*r	{q}	{r}	ϕ	{p}

(10 Marks)

b. Define distinguishable and Indistinguishable states. Minimize the following DFSM.

δ	a	b
→A	B	F
B	G	C
*C	A	C
D	C	G
E	H	F
F	C	G
G	G	E
H	G	C

(10 Marks)

3 a. Define Regular expression. Write the regular expression for the following languages:

i) To accept strings of a's and b's such that third symbol from the right is 'a' and fourth symbol from the right is 'b'.

ii) $L = \{a^n b^m; n \geq 4, m \leq 3\}$ **(10 Marks)**

b. Build a regular expression from the following FSM (Finite State Machine). **(06 Marks)**

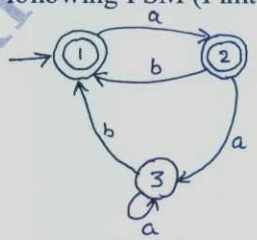

Fig.Q.3(b)

c. Write an equivalent NDFSM for the following regular expression $a(a^* + b^*)^*b$. **(04 Marks)**

4 a. Show that regular languages are closed under complement and intersection. **(10 Marks)**

b. State and prove pumping lemma theorem for regular languages. And show that the language $L = \{WW^R : W \in \{0, 1\}^*$ is not regular$\}$. **(10 Marks)**

5 a. Define CFG (Context Free Grammar). Design CFG for the languages.

i) $L = \{O^{2n}1^m | n >= 0, m >= 0\}$

ii) $L = \{O^i 1^j 2^k | i = j \text{ or } j = k\}$ **(10 Marks)**

b. Define Ambiguity. Is the following grammar ambiguous? Give reason.

$S \rightarrow iCts | iCtSeS | a$

$C \rightarrow b$ **(10 Marks)**

6 a. Define CNF (Chomsky Normal Form). Convert the following CFG to CNF.

$S \rightarrow aACa,\ A \rightarrow B|a,\ B \rightarrow C|c,\ C \rightarrow cC|\varepsilon$ **(10 Marks)**

b. Define PDA (Push Down Automata). Design a PDA to accept the following language, $L = \{a^n b^n : n >= 0\}$. Draw the transition diagram for the constructed PDA. Show the ID's for the string aaabbb. **(10 Marks)**

7 a. Define a Turing Machine. Explain the working of a Turing Machine. **(08 Marks)**

b. Design a Turing Machine to accept $L = \{0^n 1^n 2^n | n >= 0\}$. Draw the transition diagram. Show the moves made for string 001122. **(12 Marks)**

8 a. Design a TM for addition of 2 numbers (2 + 3) with transition diagram and ID for the same. **(14 Marks)**

b. Define and differentiate DTM and NDTM. **(06 Marks)**

9 a. Explain post correspondence problem. **(08 Marks)**

b. Explain Halting problem in Turing Machine. **(08 Marks)**

c. Write a note on Church Turing Hypothesis. **(04 Marks)**

10 a. Explain three variants of Turing Machine. **(12 Marks)**

b. Write a note on Quantum Computation. **(08 Marks)**

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18CS55

Fifth Semester B.E. Degree Examination, July/August 2021
Application Development using Python

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions.

1 a. Explain string concatenation and string replication operator with an example. **(05 Marks)**

b. Illustrate the use of break and continue with an example. **(05 Marks)**

c. With the flow chart, explain the flow control statements while, for and elif. Write a python program to check whether the given number is positive, negative or zero. **(10 Marks)**

2 a. What are functions? Define python function with parameter and return statement. Write a python function to generate the factorial of a number. **(07 Marks)**

b. Explain local and global scope with suitable example. **(05 Marks)**

c. Define exception handling. How exceptions are handled in python? Write a python program to solve divide by zero exception. **(08 Marks)**

3 a. Explain negative indexing, slicing, index( ), append( ), insert( ) and sort( ) method with suitable example. **(12 Marks)**

b. Write a python program to generate the following pattern using String center( ) method.

```
----*----
---***---
--*****--
-*******-
*********
```

(08 Marks)

4 a. What is dictionary? How it differs from list? Write a program to count the number of occurrences of each character in string. **(08 Marks)**

b. Define tuple data type. List out the differences between Tuple and list. Create a list of even numbers and convert it into a tuple. **(06 Marks)**

c. Write the output of the following:

(i) 'Hello'.upper.isupper( )

(ii) 'Hello'.upper( ).lower( )

(iii) '–'.join ('There can be only one'.split( )) **(06 Marks)**

5 a. Describe Greedy, Non greedy pattern matching and findall( ) method of Regex object with suitable code snippet. **(07 Marks)**

b. Write a python program to demonstrate file reading and writing process. **(06 Marks)**

c. List out the difference between shutil.copy( ) and shutil.copytree( ) method. Explain in brief move, rename is deleting files and folders in shutil module with example. **(07 Marks)**

6 a. Write a python program to extract the American phone number (eg. 415-555-4242) and email in a given string using Regular Expressions. **(06 Marks)**

b. Define assertions. Explain how assertions can be used in traffic light simulation with python code snippet. **(07 Marks)**

c. List out the benefits of compressing a file. With code snippet, explain reading and extracting from a zip file. **(07 Marks)**

7 a. Explain operator overloading with example. (07 Marks)
b. Illustrate the concept of pure functions and modifier using python code. (10 Marks)
c. Explain init( ) method with example. (03 Marks)

8 a. Define classes and objects in python. Create a class called Employee and initialize it with emp_id, name and salary. Write the methods to set values for name, salary and display the employee details. (08 Marks)
b. Illustrate the concept of inheritance with example. (06 Marks)
c. Explain Type-based dispatch with example. (06 Marks)

9 a. What is JSON? Briefly explain the json module to read and write JSON data with code snippet. (07 Marks)
b. Explain the process of downloading files from the web with the requests module and saving downloaded files to the hard drive with suitable examples. (08 Marks)
c. Write short notes on encrypting pdf files. (05 Marks)

10 a. Explain how to retrieve a web page element from a BeautifulSoup object using select( ) Method. (10 Marks)
b. Illustrate with example how do you create and save excel document. (05 Marks)
c. With code snippet explain the process of reading data from a CSV file. (05 Marks)

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18CS56

Fifth Semester B.E. Degree Examination, July/August 2021
UNIX Programming

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. With a neat diagram, describe the architecture of UNIX operating system. **(08 Marks)**
b. Explain the following commands with example for each i) cat ii) mv iii) cp iv) wc. **(08 Marks)**
c. Explain the different types of files supported by UNIX operating system. **(04 Marks)**

2 a. With a neat diagram, describe the parent-child representation for file organization of UNIX OS. **(08 Marks)**
b. Differentiate absolute path names and relative path names with example for each. **(08 Marks)**
c. Describe the importance of "root" and "su" command. **(04 Marks)**

3 a. With a neat diagram, describe the Shell's interpretive life cycle. **(08 Marks)**
b. Define File Permission. Explain the relative and absolute mode of using "chmod" command with example for each. **(08 Marks)**
c. Describe "chown" and "chgrp" command with example for each. **(04 Marks)**

4 a. Define Extended Regular Expression (ERE). Describe any four ERE used by grep and egrep. **(10 Marks)**
b. With example for each. Explain standard input and standard output with redirection. **(10 Marks)**

5 a. With a neat diagram, describe the Memory Layout of a 'C' program. **(08 Marks)**
b. List and explain any four regular File API's. **(08 Marks)**
c. Define the following :
i) Read lock
ii) Write lock
iii) Mandatory lock
iv) Advisory lock. **(04 Marks)**

6 a. With a neat block diagram, explain the process of launching and termination indicating role of C-startup routine and exit handlers. **(08 Marks)**
b. Explain the following system calls :
i) fork( ) ii) vfork( ) iii) exit( ) iv) waitpid( ). **(08 Marks)**
c. Define race condition. Write a 'C' program to demonstrate the race condition. **(04 Marks)**

7 a. With the help of structure of accounting records defined in <sys/acct.h>. Describe the process accounting supported by UNIX OS. **(10 Marks)**
b. Define Interprocess Communication (IPC). List the different approaches supported by UNIX OS for InterProcess communication with explanation for any three. **(10 Marks)**

8 a. Define pipes. Explain the Popen and Pclose function with example for each. **(10 Marks)**
b. Describe the semaphore and shared memory approaches for Inter Process Communication (IPC). **(10 Marks)**

9 a. Define Signal. List and explain the conditions that generate signals. **(10 Marks)**
b. List and describe the disposition/action taken for the occurrence of a signal. **(06 Marks)**
c. Describe the purpose of the following signals along with the default action for each :
i) SIGPOLL ii) SIGPWR iii) SIGXCPU iv) SIGXRES. **(04 Marks)**

10 a. Define Daemon process. Describe the characteristics of Daemon process. **(08 Marks)**
b. With a neat diagram, describe the error handling with respect to daemon process. **(08 Marks)**
c. List and explain the conventions followed with respect to daemon process. **(04 Marks)**

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17CS562

Fifth Semester B.E. Degree Examination, July/August 2021
Artificial Intelligence

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions.

1 a. What is Artificial Intelligence? Explain. **(06 Marks)**

b. A water jug problem: Two Jugs of 4L and 3L capacity (No marker on it). How can you get exactly 2L of water into 4L jug? Write both production rule and solution. **(10 Marks)**

c. What is meant by uniformed search? Explain Depth-first-search strategy. **(04 Marks)**

2 a. What is an AI technique? Explain. **(06 Marks)**

b. Write a note on Production System. **(06 Marks)**

c. Crypt arithmetic problem:

SEND
+ MORE
MONEY

Initial state: No two letters have same value. Sum of digits must be shown. **(08 Marks)**

3 a. Explain mapping between Facts and representation with example. **(05 Marks)**

b. Explain Forward and Backward reasoning. **(05 Marks)**

c. Translate following into First Order Logic:
(i) All pompeins were Romans.
(ii) All Romans are either loyal to Caesar or hated him.
(iii) Everyone is loyal to someone.
(iv) Was Macrus loyal to Caesar?
(v) All pompeins died when the voleano errupted in 79AD. **(10 Marks)**

4 a. Explain Inheritable knowledge. **(06 Marks)**

b. Consider following sentences:
(i) John likes all kind of food.
(ii) Apple and Chicken are food.
(iii) Anything anyone eats and is not killed by is food.
(iv) Bill eats peanuts and is still alive.
(v) Sue eats everything bill eats.
Using resolution prove that "John likes Peanuts". **(10 Marks)**

c. Write a note on Matching. **(04 Marks)**

5 a. Explain logics for Non-Monotonic reasoning. **(06 Marks)**

b. What is Bayesian Network? Explain semantics of it. **(08 Marks)**

c. Explain slot as full-fledged objects. **(06 Marks)**

6	a.	Explain implementation of Breadth-first search.	(08 Marks)
	b.	State Baye's theorem. How it is used in statistical reasoning?	(08 Marks)
	c.	Write a note on Semantic Nets.	(04 Marks)
7	a.	Explain Conceptual dependency.	(08 Marks)
	b.	What is global ontology? Explain.	(06 Marks)
	c.	Write about iterative deepening.	(06 Marks)
8	a.	Explain CYC and its motivations.	(10 Marks)
	b.	Explain Min Max search procedure.	(10 Marks)
9	a.	Explain various steps in natural language understanding process.	(10 Marks)
	b.	Write a note on Knowledge Acquisition.	(10 Marks)
10	a.	Explain how decision trees are used in learning.	(06 Marks)
	b.	What are the capabilities expected from expert systems.	(08 Marks)
	c.	Explain the process of learning from examples.	(06 Marks)

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