CBCS SCHEME

Fifth Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023
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? List the functional areas of management and explain any two in detail. **(10 Marks)**
    b. Explain in detail levels of management. **(06 Marks)**
    c. Briefly describe importance of Staffing. **(04 Marks)**

OR

2   a. Discuss the importance of planning Briefly explain the general steps involved in planning. **(10 Marks)**
    b. Explain any two Management Approaches. **(06 Marks)**
    c. Write a difference between Formal and Informal organization. **(04 Marks**

Module-2

3   a. What is Motivation? Explain Maslow's Need Hierarchy theory of Motivation. **(10 Marks)**
    b. Differentiate between co-ordination and co-operation. **(06 Marks)**
    c. Write a difference between Manager and a Leader. **(04 Marks**

OR

4   a. Define Control. Briefly explain the methods of establishing control. **(10 Marks)**
    b. What are the merits and demerits of Hertzberg's two factor theory? **(06 Marks)**
    c. List the characteristics of Direction. **(04 Marks)**

Module-3

5   a. Define Entrepreneur. Explain the functions of entrepreneur. **(10 Marks)**
    b. Briefly describe the stages in entrepreneurial process. **(06 Marks)**
    c. Write the differences between Entrepreneurs and Intrapreneurs. **(04 Marks)**

OR

6   a. Explain different types of entrepreneurs along with classifications. **(10 Marks)**
    b. What are the barriers of an entrepreneur? **(06 Marks)**
    c. Write the differences between Entrepreneur and Manager. **(04 Marks)**

Module-4

7   a. Define the meaning of Project. Explain in detail the various ways of Project Identification. **(10 Marks)**
    b. Briefly describe the contents of Project Report. **(06 Marks)**
    c. List the different sequential stages for formulation of Project Report. **(04 Marks)**

OR

8	a.	Define ERP? Explain the importance and need of a ERP.	(10 Marks)
	b.	Write short notes on functional areas of management of ERP.	(06 Marks)
	c.	List the planning commission guidelines for preparing industrial projects.	(04 Marks)

Module-5

9	a.	Explain the steps involved in establishing Micro and Small enterprise.	(10 Marks)
	b.	Discuss the case study of air Deccan (Captain G.R. Gopinath).	(06 Marks)
	c.	What is Patent? List different types of Patent.	(04 Marks)

OR

10 a. Explain the following :
  i)   KIADB
  ii) KSSIDC
  iii) NSIC
  iv) KSFC
  v)   DIC. (10 Marks)
  b. Discuss the case study of Infosys – N.R. Narayana Murthy. (06 Marks)
  c. List the advantages of Micro and Small enterprises. (04 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
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 use of cookie files in web applications.   **(06 Marks)**
   b. With a neat diagram, explain how SMTP can be used for transmitting mails from sender to receiver.   **(08 Marks)**
   c. Discuss the working of Bit Torrent for file distribution.   **(06 Marks)**

OR

2 a. Differentiate between persistent and non persistent connections in HTTP.   **(05 Marks)**
   b. In brief explain the conditional GET operation.   **(05 Marks)**
   c. Describe the DNS records and messages in detail.   **(10 Marks)**

Module-2

3 a. In brief describe UDP segment structure and checksum computation.   **(06 Marks)**
   b. With a neat diagram demonstrate the working of GO-BACK-N protocol.   **(08 Marks)**
   c. Explain TCP flow control in detail.   **(06 Marks)**

OR

4 a. With the help of a FSM, describe reliable data transfer in a Lossy channel with bit errors (rdt 3.0).   **(08 Marks)**
   b. Explain the various fields of a TCP segment structure.   **(05 Marks)**
   c. What are the approaches to congestion control? Explain in detail with example.   **(07 Marks)**

Module-3

5 a. Explain inter autonomous system routing with Border Gateway protocol.   **(08 Marks)**
   b. Explain various Broadcast Routing algorithms.   **(08 Marks)**
   c. Write a note on IGMP protocol.   **(04 Marks)**

OR

6 a. Write the link state algorithm and apply it to the following graph. Assume node 'u' as the source node.   **(10 Marks)**
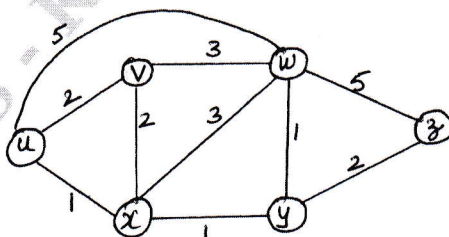

Fig.Q.6(a)

   b. Explain the architecture of a Router.   **(10 Marks)**

Module-4

7 a. What are the elements of network security? Discuss the threats to network security.

(10 Marks)

   b. Explain RSA algorithm. Using RSA encrypt a message m = 9. Assume p = 3 and q = 11. Find the public key and private key, also show encryption and decryption.   (10 Marks)

OR

8 a. Explain the working of DES algorithm.   (08 Marks)
   b. Discuss the secure Hash Algorithm.   (06 Marks)
   c. Write a note on firewalls.   (06 Marks)

Module-5

9 a. Explain the types of multimedia network applications.   (06 Marks)
   b. Briefly explain how DNS redirects a user request to a CDN server.   (08 Marks)
   c. With a diagram, explain SIP call establishment.   (06 Marks)

OR

10 a. What are the properties of video and audio? Explain in detail.   (07 Marks)
    b. With a neat diagram, explain streaming stored video over HTTP.   (07 Marks)
    c. Explain the Forward Error Correction (FEC) technique for loss anticipation in VoIP application.   (06 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
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.   Describe the characteristics of database approach.   (08 Marks)
    b.   List and explain the criteria for classification of DBMS.   (08 Marks)
   c.   Write an ER diagram to represent CAR entity type with 2 key attributes Registration and Vehicle ID.   (04 Marks)

OR

2   a.   Write an UML class diagram notation for company conceptual schema.   (10 Marks)
    b.   Define the following terms :   i)   Data Model   ii)   Schema   iii)   Instance
         iv)   Canned transaction   v)   Data Manupulation Language (DML).   (10 Marks)

Module-2

3   a.   Explain the concepts of specialization and Generalization, with the help of VEHICLE superclass.   (08Marks)
    b.   Explain the different Relational Model constraints.   (06 Marks)
    c.   Create a table for the Works_In relationship shown in Fig. Q3(c).   (06 Marks)

Fig. Q3(c)

OR
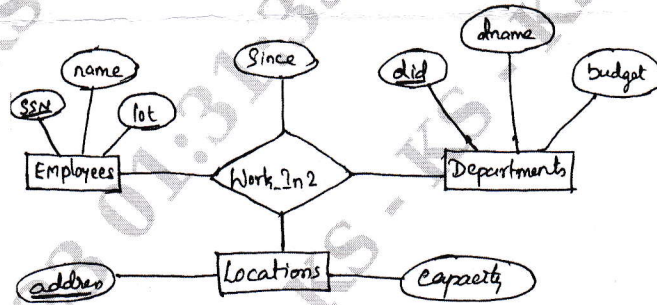
4   Considered the COMPANY DATABASE
    EMPLOYEE (Fname , Minit , Lname , Ssn , Bdata , Address , Sex , Salary , Super_Ssn , Dno).
    DEPARTMENT (Dname , Dnumber , Mgr_Ssn , Mgr_Start_data)
    DEPART_LOCATIONS (Dnumber , DLocation)
    PROJECT (Pname , Pnumber , PLocation , Dnum)
    WORKS_ON (ESsn , Pno , Hours)
    DEPENDENT (ESsn , Dependent_name , Sex , Bdate , Relationship).
    Specify the following queries in SQL on the database schema given above.
    a.   For every project located in 'Stafford' , list the project number, the controlling department number and the department managers last name , address and birth date.   (06 Marks)
    b.   Retrieve the birth date and address of the employees whose name is 'John B, Smith'.
                                                                                         (06 Marks)
    c.   Retrieve the name and address of all employees who work for the 'Research' department.
                                                                                         (06 Marks)
    d.   Retrieve the salary of every employee.   (02 Marks)

Module-3

5 a. Discuss EXISTS and UNIQUE functions in SQL. Consider the COMPANY database given in Question number 04, write a query to list the name of the Manager who have atleast one dependent. **(08 Marks)**

b. With a real World example, explain the following :
   i) JDBC   ii) Correlated nested queries   iii) Stored Procedures
   iv) Schema change statements in SQL. **(12 Marks)**

OR

6 a. Explain the usage of Aggregate function in SQL. Write an SQL query to find sum of the salaries of all employees, the maximum salary, the minimum salary and the average salary by renaming the columns in a single row table. **(10 Marks)**

b. Create an HTML form to collect user id and password fields and it also has to have two buttons one for reset and another for login. **(06 Marks)**

c. Write a short note on : i) JavaScript   ii) CGI. **(04 Marks)**

Module-4

7 a. Describe the 3 main techniques to achieve first normal form for the relation by taking following examples schema. **(04 Marks)**

b. Discuss the Informal guidelines to determine the quality of relations schema design with a suitable example. **(10 Marks)**

c. Discuss the Insertion , Deletion and Modification anomalies. Illustrate, why are they considered bad, with an example. **(06 Marks)**

OR

8 a. What do you mean by Normalization? Explain 2NF and BCNF, with a suitable example. **(06 Marks)**

b. Consider the universal relation R = {A, B, C, D, E, F, G, H, I, J} and the set of functional dependencies
   F = {{A, B} → {C} {A} → {D, E} , {B} → {F} , {F} → {G, H} , {D} → {I, J}}.
   i) What is key of R?   ii) Decompose R into 2NF and then 3NF relation.   **(06 Marks)**

c. Write an algorithm to find a minimal cover F for a set of functional dependencies E. **(08 Marks)**

Module-5

9 a. Discuss the ACID properties of database transaction. **(08 Marks)**

b. Why concurrency control is needed? Demonstrate with an example. **(12 Marks)**

OR

10 a. Briefly explain 2 phase locking protocols. **(05 Marks)**

b. Explain Transaction support in SQL. **(05 Marks)**

c. Write a short note on :
   i) Single user and Multiuser system.
   ii) Transaction roll back and Cascadding roll back.
   iii) Shadow paging.
   iv) Database backup and recovery from catastrophic failure.
   v) Deadlock prevention protocol. **(10 Marks)**

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18CS54

Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
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 DFSM. Design DFSM
         i)   To accept strings over {a, b} such that each block of 5 (length five) consecutive symbols have atleast two a's.
         ii) To accept L = {ω(ab + ba) | ω ∈ {a, b}* }
         iii) To accept L = {ωbab | ω∈ {a, b}* }   **(10 Marks)**
     b. Define distinguishable and indistinguishable states. Minimize the following DFSM.

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

(10 Marks)

OR

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

Fig.Q2(a)   **(08 Marks)**
     b. Explain the simulators for Finite State Machine.   **(06 Marks)**
     c. Design
         (i) Mealy Machine that accepts the string that ends either with aa or bb and Σ = {a, b}
         (ii) Moore Machine that produces 'A', 'B' and 'C' depending on inputs that end with '10', '11' and others respectively.   **(06 Marks)**

Module-2

3   a.   Build regular expression from the following FSM. [Refer Fig.Q3(a)].
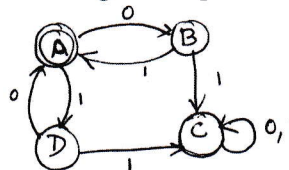
Fig.Q3(a)   **(05 Marks)**
     b. State and prove pumping Lemma theorem for regular languages. Show that L = {a^m b^n | n ≥ 0} is not Regular.   **(10 Marks)**
     c. Show that regular languages are closed under complement and intersection.   **(05 Marks)**

OR

4 a. Obtain Regular Expression for the following languages.
   (i)   L = { $a^n b^m c^p$ | n ≤ 4 , m ≥ 2 , p ≤ 2 }
   (ii) L = { ω : |ω| mod 3 = 0 & ω ∈ {a, b}* }
   (iii) L = { $a^n b^m$ | m + n is even } **(08 Marks)**

   b. Prove Kleen's theorem – Any language that can be defined with a regular expression can be accepted by some FSM and so is regular. **(08 Marks)**

   c. Obtain NDFSM for the following regular expression (a + b)* abb. **(04 Marks)**

Module-3

5 a. Design a PDA for the language
   L = { $\omega c \omega^R$ | ω ∈ (a, b)* where ω^R is reverse of ω }
   and show the moves made by PDA for the string "aabcbaa" and "abacbba". **(10 Marks)**

   b. Define Leftmost derivation, Rightmost derivation and Parse tree. Consider the grammar.
   S → AbB   A → aA |∈
   B → aB | bB | ∈   D → a |∈
   Obtain LMD, RMD and parse tree for the string "aaabab". **(10 Marks)**

OR

6 a. Define CFG and design a CFG for the following language.
   (i)   L = {$0^m 1^m 2^n$ | m ≥1 and n ≥ 0}
   (ii) L = { $\omega \omega^R$ | ω ∈ (a, b)* }
   (iii) L = {$a^n b^m c^k$ | n+2m = k for m ≥ 0 and n ≥ 0 } **(10 Marks)**

   b. Define CNF. Convert the following CFG into CNF.
   S → ASB | ∈   A → aAS | a   B → SbS | A | bb **(10 Marks)**

Module-4

7 a. Define TM and design a turing machine for L = {ω | ω ∈ (0+1)* containing the substring 001}
   Write transition diagram and show the moves made by the Turing machine for input string 10010. **(14 Marks)**

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

OR

8 a. With a neat diagram explain the working of Multitape Turing Machine. **(08 Marks)**

   b. Design a Turing machine to accept L = {$0^n 1^n$ | n ≥ 1 }. Show the moves made for the string 0011 and 00111. **(12 Marks)**

Module-5

9 Write short notes on :
   a. Linear Bound Automata **(06 Marks)**
   b. Church Turing Thesis **(07 Marks)**
   c. Non-Deterministic Turing Machine **(07 Marks)**

OR

10 a. Explain Halting Problem and Post Correspondence problem in Turing Machine. **(10 Marks)**

   b. Discuss the following :
   i) Decidable and Undecidable Language **(05 Marks)**
   ii) Quantum Computers **(05 Marks)**

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CBCS SCHEME

Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
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.   **(04 Marks)**
   b. Explain the math operators in python from highest to lowest precedence with an example for each. Show steps to evaluate $(5 - 1) * (7 + 1) (3 - 1)$ in python.   **(08 Marks)**
   c. Write a program to find the sum of all odd and even numbers of n elements. Here skip the numbers which are divisible by 3.   **(08 Marks)**

OR

2 a. Give one example for each of the operation below in python language:
      i)   String concatenation and replication.
      ii) Read input and display.   **(10 Marks)**
   b. Explain:
      i)   Def statements with parameters
      ii) Return values and return statements with an example.   **(10 Marks)**

Module-2

3 a. Discuss the different ways of traversing a list. Explain each with an example.   **(10 Marks)**
   b. Write a python program that allows a player to guess a secret number within 6 chances. The code that lets the player enter a guess and checks that guess is right or not by printing appropriate message. List of numbers are taken as an input from the user.   **(07 Marks)**
   c. Write a program to demonstrate the use of pretty function.   **(03 Marks)**

OR

4 a. Compare list and dictionary data structures with respect to python language.   **(04 Marks)**
   b. Write a program in python that counts. The number of occurrences of each letter in a string. Display the results in column fashion.   **(08 Marks)**
   c. Write the string method syntax in python to perform below operations.
      i)   Removing white space characters from beginning, end or both sides of a string.
      ii) To right-justify, left-justify and center a string.   **(08 Marks)**

Module-3

5 a. List out the different character classes. Give representation, regular expression symbols, example and meanings for each character class.   **(10 Marks)**
   b. Describe the following with suitable python code snippet:
      i)   Greedy and Non Greedy pattern matching.
      ii) Findall( ) method of RegeX object.   **(10 Marks)**

OR

6 a. Write a python program to rename the filename contains American style dates (MM – DD – YYYY) to European style dates (DD – MM – YYYY) in the working directory. (10 Marks)
   b. What are Assertions in python? Explain with an example. (05 Marks)
   c. Explain the file reading and writing process with suitable python program. (05 Marks)

Module-4

7 a. How objects are mutable by nature justify with an example? (04 Marks)
   b. Discuss the methods isinstance( ) and hasattr( ) with suitable example for each. (06 Marks)
   c. What is operator over loading? Write a program to add two point objects by overloading + operator. Also, overload – str – ( ) to display point as an ordered pair. (10 Marks)

OR

8 a. Define Inheritance. Explain with an example. (06 Marks)
   b. Briefly discuss the importance of - -init- -( ) and - - sti - ( ) methods in python. (04 Marks)
   c. Demonstrate the polymorphism to generate histogram to count the number of times each letter appears in word and in sentence. (10 Marks)

Module-5

9 a. Analyze the steps involved in downloading and saving web page on to local system along with program. (06 Marks)
   b. List any 4 CSS selectors of bs4 module. Using Beautiful soup passel, retrieve all of the paragraph tags in the web page www.amazon.com. (06 Marks)
   c. How selenium module is useful to deal with web pages. What methods do it uses to simulate mouse clicks and keyboard keys? (08 Marks)

OR

10 a. Write a program to read the census data from the excel spreadsheet, count the number of census tracts in each country, count the total population of each country and prints the results.

1	Census tract	State	County	POP2010
9841	06075010500	CA	SanFrancsico	2685
9842	06075010600	CA	SanFrancisco	3894
9843	06075010700	CA	SanFrancisco	5592

(08 Marks)
   b. How to zip the files and folders. Demonstrate with one example. (04 Marks)
   c. Write a script that will go through every PDF in a folder and encrypt the PDFS using a password provided on the command line. Save each encrypted PDF with an-encrypted pdf suffix added to the original filename. (08 Marks)

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Fifth Semester B.E. Degree Examination, Jan./Feb. 2023
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. Compare internal commands and external commends, files and processes.   **(06 Marks)**
    b. Explain all the features of UNIX operating system.   **(09 Marks)**
    c. Write the output for the following commands :
        i)   cal 10 2021
        ii) date +"%D%T"
        iii) type echo
        iv) passwd
        v)   who.   **(05 Marks)**

OR

2   a. Explain the different categories of files with examples.   **(06 Marks)**
    b. Describe the parent child relationship in UNIX file system and differentiate absolute pathnames with relative path names.   **(06 Marks)**
    c. Write the description for the following commands.
        i)   mkdir college college/ISE college/CSE
        ii)   mV $f_1 \cdot C$ $f_2 \cdot C$ $f_3 \cdot C$ cprogs
        iii) if my pwd is /home/ravi/progs then Cd ··/··
        iv)   ls – l ¦ wc – l
        v)   cp f_1 f_2 f_3 files
        vi)   rm – i chap1
        vii) cat >> test·txt
        viii) rmdir college/ISE   **(08 Marks)**

Module-2

3   a. Explain all the options of ls commands with examples.   **(06 Marks)**
    b. Consider a file test·txt with default permissions as – rw – r – – r – –, grant execute permission to owner, write and execute permission to group members and execute permission to others using both relative and absolute approaches.   **(04 Marks)**
    c. Write the output for the following commands.
        i)   cp ???? progs
        ii) rm 'chap*'
        iii) mV *·[!C][!P][!P] progs
        iv) cat *·txt ¦ wc – C
        v)   cp chap\[0 – 1\].   **(05 Marks)**
    d. Explain the grep command with all its options.   **(05 Marks)**

OR

4 a. Write a program to read pattern and filename from the user and search the pattern in the given file. **(05 Marks)**

b. Write the output for the following commands.
   i) grep "Anil" std·lst ¦¦ echo "pattern not found"
   ii) test $x – gt $y
   iii) [–Z $stg]
   iv) [–r $file]
   v) [!– n $stg] **(05 Marks)**

c. Explain all the looping statements with syntax. **(06 Marks)**

d. Write a shell script to read multiple patterns from the command line and search these patterns in the given file which is also read from command line by using shift command.
   [Ex. Command line arguments as below #>script.sh pat$_1$ pat$_2$ pat$_3$ pat$_4$ pat$_5$]. **(04 Marks)**

Module-3

5 a. Explain the General File API's open( ), read( ), write( ), lseek( ) with their prototype. **(10 Marks)**

b. Describe the memory layout of a C program with a diagram and explain memory allocation API's with their prototypes. **(10 Marks)**

OR

6 a. Explain setjmp and longjmp, getrlimit and setrlimit function with examples. **(10 Marks)**

b. Describe how the process is created by using fork( ) and vfork( ). List out the properties inherited from the parent when the child process is created? **(10 Marks)**

Module-4

7 a. Explain the implementation of system function using fork( ), exec( ), wait( ) API's. **(10 Marks)**

b. Define pipes, write a program to send data from parent to child using pipe API and also list its limitations. **(10 Marks)**

OR

8 a. Define semaphores and explain how the IPC is implemented using various semaphore API's. **(10 Marks)**

b. Explain the implementation of shared memory IPC mechanism with all its API's and their prototypes. **(10 Marks)**

Module-5

9 a. Define signal and list the actions taken by a process when the signal is raised. Explain the signal API's signal( ), sigset( ), sigaction( ). **(10 Marks)**

b. Explain how kill API is used for sending a signal to a process and explain the implementation of sleep API using alarm API. **(10 Marks)**

OR

10 a. Define the Daemon process. Explain all the coding rules to be followed while coding a daemon process **(10 Marks)**

b. Write a note on interval timer. **(05 Marks)**

c. Explain the BSD syslog facility for handling Daemons error messages. **(05 Marks)**

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