

**B.L.D.E.A's V.P.Dr.P.G.HALAKATTI COLLEGE OF ENGINEERING AND
TECHNOLOGY VIJYAPUR 586103**

INDEX FILE 7 & 8th SEMESTER QUESTION PAPERS JAN/FEB 2023

5th, 7TH and 8th SEMESTER

COMPUTER SCIENCE AND INFORMATION SCIENCE

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023
Web Technology and Its Applications

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 standard HTML structure and syntax with an example to demonstrate the same. (10 Marks)
b. Illustrate with an example the different types of selectors used in CSS. (10 Marks)

OR

- 2 a. Explain the different types of list elements available in HTML5 with example. (10 Marks)
b. Illustrate with an example the three different levels of CSS. (10 Marks)

Module-2

- 3 a. Explain the different table attributes and write the HTML code for the following table:

		Fruit Juice		
		Apple	Grape	Orange
Diet	Lunch	00	00	01
	Dinner	01	00	00
	Breakfast	00	01	00

- b. Differentiate between GET and POST method. (10 Marks)
c. List and describe the various types of Text input controls. (05 Marks)
(05 Marks)

OR

- 4 a. Explain the various types of positioning elements used in CSS3 with example. (10 Marks)
b. Explain briefly the different types of approaches to CSS layout. (06 Marks)
c. Briefly explain the importance of Responsive Design. (04 Marks)

Module-3

- 5 a. Illustrate with an example the three different ways of Linking Javascript to HTML. (10 Marks)
b. Define Document Object Model. Explain its different nodes along with its properties and methods. (10 Marks)

OR

- 6 a. List and explain the different types of events specified by the W3C. (10 Marks)
b. Illustrate with an example to embed the PHP code into the HTML. (06 Marks)
c. Illustrate with a simple example for defining and calling functions in PHP. (04 Marks)

Module-4

- 7 a. Illustrate with a simple code to Add and Delete the elements to the array in PHP. (06 Marks)
b. List and describe the different types of super global array used in PHP. (07 Marks)
c. List and explain the various built in functions of Array in PHP. (07 Marks)

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

- 8 a. Explain the different file handling functions used in PHP. (08 Marks)
b. How constructors are defined in PHP? Explain with example. (06 Marks)
c. How exceptions are handled in PHP? (06 Marks)

Module-5

- 9 a. Explain the different ways of passing information to the server. (08 Marks)
b. Define cookie. Write a PHP code to read and write cookie. (08 Marks)
c. Discuss briefly the HTML5 web storage. (04 Marks)

OR

- 10 a. Define XSLT. Explain the XSLT workflow with a neat diagram. (08 Marks)
b. Define jQuery. List and describe the different forms selectors of the jQuery. (06 Marks)
c. Discuss the following : (06 Marks)
i) JSON ii) Web services.

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17CS72

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Advanced Computer Architectures

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. What are Performance factors? How system attributes affects on Performance factors? Explain. (08 Marks)
- b. Explain the Architecture of the Vector Super Computer, with diagram. (07 Marks)
- c. Explain the Flynn's classification briefly. (05 Marks)

OR

- 2 a. What is Data Dependence? Explain types of Data dependence with dependency graph. (08 Marks)
- b. Explain Static Interconnection Networks with examples. (07 Marks)
- c. What are the metrics affecting the scalability of Computer Architecture? Explain. (05 Marks)

Module-2

- 3 a. With diagram, explain the basic architecture of the scalar computers. (08 Marks)
- b. Distinguish Architectures between CISC and RISC computers, with neat diagram. (05 Marks)
- c. What is Super Scalar Architecture? Explain the superscalar RISC processor architecture. (07 Marks)

OR

- 4 a. With diagram, explain the hierarchy of the Memory Technology. (05 Marks)
- b. Explain the Inclusion property and locality of reference along with its type in Memory hierarchy. (07 Marks)
- c. Explain TLB, Paging and Segmentation. (08 Marks)

Module-3

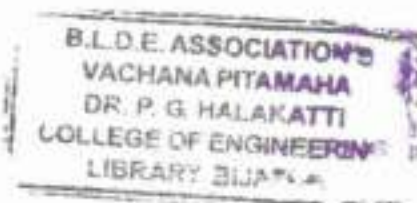
- 5 a. What is Bus Arbitration? Explain distributed Bus Arbitration. (07 Marks)
- b. Explain Cache Memory modes with neat diagram. (08 Marks)
- c. Explain Sequential Consistency Memory Model. (05 Marks)

OR

- 6 a. Explain Speedup, Efficiency and through put of Linear Pipeline Processors. (05 Marks)
- b. Consider the reservation table given below and determine the
 - i) For bidden latencies ii) MAL iii) Initial collision vector and
 - iv) Stat diagram for the non linear pipeline. (07 Marks)

	1	2	3	4	5	6
S1	X					X
S2		X			X	
S3			X			
S4				X		
S5		X				X

1 of 2



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- c. What are Instruction Pipeline Processors? Explain Pipeline design multiplication 8 – bit arithmetic, with diagram. (08 Marks)

Module-4

- 7 a. What are the Dynamic Interconnect Networks? Explain Routing in Dynamic OMEGA 8×8 Interconnect Network using 2×2 switch modules. (08 Marks)
 b. What is Vector Processing? Explain Vector schemes and memory with diagram. (07 Marks)
 c. Write a note on Cross Bar Networks design V/s Multiport Memory. (05 Marks)

OR

- 8 a. Explain Hierarchical Bus System with diagram. (05 Marks)
 b. Explain four Context – Switching Policies in Multiprocessing Modes. (08 Marks)
 c. Explain Connection Machine CM – 2 Architecture, with diagram. (07 Marks)

Module-5

- 9 a. Define Parallel Programming Model. Explain shared and distributed parallel models. (08 Marks)
 b. Explain Concurrent OOP and Actor model in Object Oriented Parallel Programming Model. (05 Marks)
 c. Explain principles of Synchronization in Parallel Programming in Multiprocessing. (07 Marks)

OR

- 10 a. With the help of neat diagram, explain Computation phases in code generation in parallel computation. (07 Marks)
 b. Explain different language features of Parallel programming. (08 Marks)
 c. Write a note on Dependency Testing. Briefly. (05 Marks)

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17CS73

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Machine Learning

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 following problems with respect to tasks, performance and experience
- i) A checkers learning problem
 - ii) A handwriting recognition learning problem
 - iii) A robot driving learning problem. (06 Marks)
- b. List out any four applications of machine learning. (04 Marks)
- c. Find the maximally general hypothesis and maximally specific hypothesis taking the enjoy sport concept and training instances given in Table 1(c) and discuss the advantages of the algorithm. (10 Marks)

Table 1(c)

Examples	Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

OR

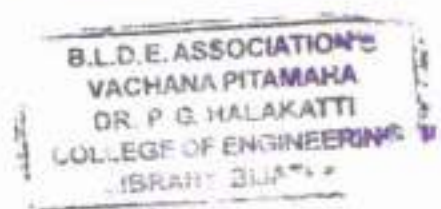
- 2 a. Explain the steps in designing learning system in details. (10 Marks)
- b. Describe the find-s algorithm. Find the most specific hypothesis by taking data set given in Table 2(b) and discuss the issues with the algorithm. (10 Marks)

Table 2(b)

Example	Eyes	Nose	Head	Color	Hair	Smile
1	Round	Triangle	Round	Purple	Yes	Yes
2	Square	Square	Square	Green	Yes	No
3	Square	Triangle	Round	Yellow	Yes	Yes
4	Round	Triangle	Round	Green	No	No
5	Square	Square	Round	Yellow	Yes	Yes

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Module-2

- 3 a. Explain the concept of entropy and information gain. (04 Marks)
b. Apply ID3 algorithm for constructing decision tree for the training example shown in Table 3(b). Here the target attribute is classification. Draw the complete decision tree. (12 Marks)

Table 3(b)

Day	A1	A2	A3	Classification
1	True	Hot	High	No
2	True	Hot	High	No
3	False	Hot	High	Yes
4	False	Cool	Normal	Yes
5	False	Cool	Normal	Yes
6	True	Cool	High	No
7	True	Hot	High	No
8	True	Hot	Normal	Yes
9	False	Cool	Normal	Yes
10	False	Cool	High	No

- c. Explain Inductive bias in decision tree. (04 Marks)

OR

- 4 a. Discuss the following issues in detail:
i) Alternative measures for selecting attributes
ii) Incorporating continuous valued attributes
iii) Handling training examples with missing attribute values. (06 Marks)
b. Discuss the two approaches to prevent over-fitting the data. (06 Marks)
c. Construct decision trees to represent the Boolean functions:
i) $A \&\& \neg B$
ii) $A \vee [B\&\&C]$
iii) $A \text{ XOR } B$
iv) $[A\&\&B] \vee [C\&\&D]$ (08 Marks)

Module-3

- 5 a. What is Artificial Neural Network? Explain appropriate problem for neural network learning with its characteristics. (08 Marks)
b. Define perception. Explain the concept of single perception with neat diagram and represent the Boolean function of AND, OR using perceptron. (12 Marks)

OR

- 6 a. Write a note on: i) Perceptron training rule ii) Gradient descent and Delta rule. (08 Marks)
b. Describe the multilayer neural network. Derive the back propagation rule considering the output layer and training rule for output unit weights. (12 Marks)

Module-4

- 7 a. Define Bayesian theorem and explain Maximum A Posteriori (MAP) and Maximum Likelihood (ML) hypothesis. (10 Marks)
- b. Estimate conditional probabilities of each attributes {colour, type, origin} for the stolen classes: {yes, no} using the data given in the Table 7(b) using these probabilities estimate the probability values for the new instance - (color = red, type = SUV, origin = domestic). (10 Marks)

Table 7(b)

Colour	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	SUV	Imported	No
Yellow	SUV	Imported	Yes
Yellow	SUV	Domestic	No
Red	SUV	Imported	No
Red	Sports	Imported	Yes

OR

- 8 a. Explain the Naïve Bayes classifier algorithm and Bayesian belief networks with example. (14 Marks)
- b. Explain EM algorithm. (06 Marks)

Module-5

- 9 a. Define the following terms:
 i) Sample error ii) True error iii) Expected value. (06 Marks)
- b. Explain the K-nearest neighbor algorithm for approximating a discrete valued function $f: R^n \rightarrow V$ with pseudo code. (08 Marks)
- c. Explain case based reasoning with example. (06 Marks)

OR

- 10 a. What is reinforcement learning and explain the reinforcement learning problem with neat diagram. (07 Marks)
- b. Explain locally weighted linear regression. (07 Marks)
- c. Define ϕ - learning and write down ϕ - learning algorithm. (06 Marks)

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18CS71

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023
Artificial Intelligence and Machine Learning

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. The water jug problem states : You are provided with two jugs, one with 4 gallons of capacity and the other one with 3 gallons of capacity. Neither have any measuring markers on it. How can we get exactly two gallons of water in 4 gallon jug?
 (i) Write down the production rules for the above problem.
 (ii) Write any one solution for the above problem. (08 Marks)
- b. Explain Steepest Ascent Hill Climbing technique with an algorithm. Comment on its drawbacks and how to overcome these drawbacks. (12 Marks)

OR

- 2 a. Explain problem reduction with respect to AND-OR graph with suitable example. (07 Marks)
 b. Write AO* algorithm. (07 Marks)
 c. Discuss about constraint satisfaction and solve the below crypt arithmetic problem.
 CROSS + ROADS = DANGER (06 Marks)

Module-2

- 3 Consider the following sentences :
- John likes all kinds of food
 - Apples are food
 - Chicken is food
 - Anything anyone eats and isn't killed is food
 - Bill eats peanuts and is still alive
 - Sue eats every everything Bill eats.
- (i) Translate these sentences into formulas in predicate logic. (05 Marks)
 (ii) Prove that John likes peanuts using backward chaining. (05 Marks)
 (iii) Convert the formulas of (i) into clause form. (05 Marks)
 (iv) Prove John likes peanuts using resolution. (05 Marks)

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OR

- 4 a. Distinguish forward and backward reasoning with an example. (04 Marks)
 b. Find maximally specific hypothesis for the training instances given below. Also write Find-S algorithm. The concept of this particular problem will be on what days does a person lines to go on walk.

Time	Weather	Temperature	Company	Humidity	Wind	Goes
Morning	Sunny	Warm	Yes	Mild	Strong	Yes
Evening	Rainy	Cold	No	Mild	Normal	No
Morning	Sunny	Moderate	Yes	Normal	Normal	Yes
Evening	Sunny	Cold	Yes	High	Strong	Yes

(08 Marks)

- c. Define version space. Discuss the limitations of finds algorithm over candidate elimination algorithm. (08 Marks)

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Module-3

- 5 a. Explain the concept of decision tree learning. Write about attribute selection measure used to build the decision tree using ID3 algorithm. (07 Marks)
- b. How a single perceptron can be used to represent the Boolean functions such as AND, OR. (06 Marks)
- c. Write Gradient Descent algorithm to train a linear unit along with the derivation. (07 Marks)

OR

- 6 a. What do you mean by Gain and entropy? How it is used to build the decision tree. (08 Marks)
- b. Explain back propagation algorithm. Why is it not likely to be trapped in local minima? (08 Marks)
- c. Discuss the perceptron training rule and delta rule that solves the learning problem of perceptron. (04 Marks)

Module-4

- 7 a. Explain Naïve Bayes classifier. (08 Marks)
- b. Explain Bayesian Belief network and conditional independence with example. (08 Marks)
- c. Let us assume dangerous fires are rare (1%) but smoke is fairly common (10%) due to barbecues, and 90% of dangerous fires make smokes. Find the probability of dangerous fire when there is smoke. (04 Marks)

OR

- 8 a. Discuss minimum description length principle in brief. (08 Marks)
- b. Explain brute force MAP learning algorithm. (08 Marks)
- c. Explain EM algorithm. (04 Marks)

Module-5

- 9 a. Explain k-Nearest neighbor learning algorithm. (08 Marks)
- b. Explain Locally weighted regression. (08 Marks)
- c. What is reinforcement learning? (04 Marks)

OR

- 10 a. Distinguish Eager learning vs Lazy learning algorithms. (04 Marks)
- b. Write short notes on Q-learning. (08 Marks)
- c. Discuss about Radial basis function in detail. (08 Marks)

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Big data Analytics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define Big data. Explain the classification of Big data. (10 Marks)
b. Define Scalability and its types along with examples. (10 Marks)

OR

- 2 a. Explain the functions of each layer in Big data architecture design with a diagram. (10 Marks)
b. Define data preprocessing. Explain in brief the needs of preprocessing. (10 Marks)

Module-2

- 3 a. What is HDFS? Highlight the important design features of the HDFS. (10 Marks)
b. Bring out the concepts of the HDFS block replication with an example. (10 Marks)

OR

- 4 a. Explain Apache sqoop import and export method with neat diagram. (10 Marks)
b. Demonstrate any six HBase commands with output. (10 Marks)

Module-3

- 5 a. Explain about NOSQL data store and its characteristics. (10 Marks)
b. Describe the principle of working of the CAP theorem. (10 Marks)

OR

- 6 a. Demonstrate the working of key-value store with an example. (10 Marks)
b. Describe the features of MangoDB, and its industrial application. (10 Marks)

Module-4

- 7 a. Describe the Map tasks, Reduce tasks and Map Reduce Execution process. (10 Marks)
b. Describe the Hive architecture and its characteristics. (10 Marks)

OR

- 8 a. Demonstrate the pig architecture for scripts data flow and processing. (10 Marks)
b. Differentiate between Pig and Map Reduce, give industrial applications for each. (10 Marks)

Module-5

- 9 a. Explain the simple linear regression analysis. (10 Marks)
b. Demonstrate frequent item set mining and association rule mining. (10 Marks)

OR

- 10 a. With a neat diagram, write the steps in K-means clustering. (10 Marks)
b. Explain the purpose of web usage analytics and the significance of web graphs. (10 Marks)

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18CS731

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Software Architecture and Design Patterns

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define design pattern. Explain four essential elements of design pattern. (07 Marks)
- b. Briefly explain the design problems faced by object oriented designers. (13 Marks)

OR

- 2 a. Define Unified Modeling Language (UML). Discuss different types of UML structure diagrams. (13 Marks)
- b. What are business rules? Outline the four categories of business rules. (05 Marks)
- c. Mention the uses of defining conceptual classes and relationships. (02 Marks)

Module-2

- 3 a. Explain the Intent, Applicability and Structure of Adapter pattern. (10 Marks)
- b. Discuss the consequences and implementation issues of bridge pattern. (10 Marks)

OR

- 4 a. Explain the Intent, Applicability, Structure, Participants and Collaboration sections of proxy pattern. (14 Marks)
- b. Discuss the benefits and implementation issues of façade pattern. (06 Marks)

Module-3

- 5 a. Define behavioral patterns. Discuss Applicability, Structure, Participants, Collaborations of chain of responsibility design pattern. (12 Marks)
- b. Explain the implementation issues of command pattern. (08 Marks)

OR

- 6 a. What are the benefits and drawbacks of mediator pattern? (05 Marks)
- b. Define memento pattern and mention its applicability. (03 Marks)
- c. Discuss the implementation issues of observer pattern. (12 Marks)

Module-4

- 7 a. With a neat diagram, explain MVC architecture and its alternate view. (10 Marks)
- b. What are the benefits of MVC architectural pattern? (05 Marks)
- c. Illustrate the sequence of operations involved in drawing a line with a neat diagram. (05 Marks)

OR

- 8 a. Explain the design of model subsystem and controller subsystem. (10 Marks)
- b. Discuss pattern based solutions in detail. (10 Marks)

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Module-5

- 9 a. Define distributed systems. Explain the advantages and disadvantages of distributed systems. (05 Marks)
- b. With a neat diagram, explain the basic architecture of client/server systems in detail. (10 Marks)
- c. Write a short note on GET and POST methods. (05 Marks)

OR

- 10 a. Briefly explain the steps involved in setting up remote object system. (12 Marks)
- b. Draw and explain state transition diagrams for adding book and renewing books in Library System. (08 Marks)

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18CS734

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 User Interface Design

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define User Interface. Discuss the benefit of good design. (10 Marks)
b. Discuss the characteristics of the Graphical User Interface. (10 Marks)

OR

- 2 a. Compare GUI versus Web Page Design with respect to Devices, Data, Presentation Elements, Navigation, User tasks. (10 Marks)
b. Discuss the following general principles of user interface
i) Aesthetically pleasing ii) Compatibility iii) Consistency
iv) Control v) Simplicity. (10 Marks)

Module-2

- 3 a. List and explain common usability problems in graphical systems. (10 Marks)
b. Discuss any five Human characteristics in interface design. (10 Marks)

OR

- 4 a. Explain Indirect methods of requirement determination in Business Function. (10 Marks)
b. Discuss briefly the guidelines for designing conceptual models. (10 Marks)

Module-3

- 5 a. List and explain different structures of Menus with suitable diagrams. (12 Marks)
b. Discuss Functions and content of Menus. (08 Marks)

OR

- 6 a. Explain the purpose, advantages, disadvantages, guidelines to be followed in designing following menu choices. i) Mark Toggles ii) Toggled Menu Items. (08 Marks)
b. Discuss in detail the following Graphical menus
i) Pull - Down Menu ii) Cascading Menus iii) Popup Menus. (12 Marks)

Module-4

- 7 a. List and discuss in different ways, windows are useful. (12 Marks)
b. Explain filed windows, overlapping windows, and cascading windows their advantages and disadvantages. (08 Marks)

OR

- 8 a. Explain model and modeless and cascading and unfolding windows. (08 Marks)
b. Explain the following with respect to windows
i) frame ii) Window sizing Buttons iii) Scroll bars iv) Split box. (08 Marks)
c. Describe Joystick with advantages and disadvantages. (04 Marks)

Module-5

- 9 a. Explain different command button guide lines. (12 Marks)
b. Describe check boxes, list boxes, palettes with advantages and disadvantages. (08 Marks)

OR

- 10 a. List common presentation controls and discuss any four of them. (08 Marks)
b. Explain the following kinds of tests
i) Cognitive walk through ii) Think-Aloud Evaluations iii) Usability Test. (12 Marks)

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Cryptography

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Explain Playfair Cipher Algorithm. Find the Ciphertext for plaintext = "instruments" with key = "MONARCHY". (10 Marks)
- b. Explain with neat diagram Feistel Cipher structure for Encryption and Decryption. (10 Marks)

OR

- 2 a. Explain Hill Cipher Algorithm. Using Hill-Cipher perform encryption and decryption for plaintext = "paymoremoney" using key $K = \begin{bmatrix} 17 & 17 & 5 \\ 21 & 18 & 21 \\ 2 & 2 & 19 \end{bmatrix}$. (10 Marks)
- b. Explain with neat diagram DES encryption algorithm. (10 Marks)

Module-2

- 3 a. Explain RSA algorithm. Using RSA algorithm perform encryption and decryption using $p = 17, q = 11, e = 7$ and $M = 88$. (10 Marks)
- b. Explain Diffie-Hellman key exchange algorithm and also show that the calculations produce the identical results. (10 Marks)

OR

- 4 a. Explain Elgamal cryptosystem. Perform encryption and decryption using $q = 19, \alpha = 10, k = 6, M = 17, X_A = 5$ and $Y_A = 3$. (10 Marks)
- b. Explain the requirements and applications for public key cryptography. (10 Marks)

Module-3

- 5 a. Explain the concept of PRNG based on RSA. (10 Marks)
- b. Explain the distribution of public keys with public key Authority. (10 Marks)

OR

- 6 a. Explain with neat diagram control vector encryption and decryption. (10 Marks)
- b. Explain distribution of public keys using public key certificates. (10 Marks)

Module-4

- 7 a. Explain X.509 certificate format. (10 Marks)
- b. Bring out the differences between Kerberos version 4 and version 5 and also mention the technical deficiencies in Kerberos version 4 protocols. (10 Marks)

OR

- 8 a. Explain PKIX architectural model. (10 Marks)
- b. Explain with neat diagram the key components of Internet Mail Architecture. (10 Marks)

Module-5

- 9 a. Explain the benefits and applications of IPsec. (10 Marks)
- b. Explain the IP traffic processing for outbound and inbound packets. (10 Marks)

OR

- 10 a. Explain ESP packet format. (10 Marks)
- b. Explain the concept of transport and tunnel modes. (10 Marks)

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Python Application 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 rules of precedence used by python to evaluate an arithmetic expression. Also explain the arithmetic operators used in python. (07 Marks)
- b. With a neat diagram, explain computer hardware architecture. List and explain three types of errors encounter in python programs. (08 Marks)
- c. Write a user defined function named "Read_age" that reads and returns age of a person. Call the function to read the age of Amar, Akbar and Antony. Print the youngest and Eldest age among three friends. (05 Marks)

OR

2. a. Explain if, if-else and elif statements in python. (06 Marks)
- b. Write a program to prompt a score between 0.0 and 1.0. If the score is out of range. Print an error. If the score is between 0.0 and 1.0, print a grade using the following table:

Score	Grade
>=0.9	A
>=0.8	B
>=0.7	C
>=0.6	D
>=0.5	E
<0.5	F

- c. Define the following: (i) Functions (ii) Parameters and arguments
(iii) Fruitful functions and void functions
 Also write the reasons to divide the program into functions. (07 Marks)

Module-2

3. a. Explain while and for loop statements in python. Write a program to display First 'n' Natural numbers using while loop. (08 Marks)
- b. Write a python program to accept a filename from the user :
 (i) Display the first N-lines of the file.
 (ii) Find the frequency of occurrences of the word accepted from the user in the file. (07 Marks)
- c. Define string. Explain string slicing in python with examples. (05 Marks)

OR

4. a. Write a python program to accept a sentence from the user and display the longest and smallest word of that sentence along with its length. (07 Marks)
- b. Explain the following:
 (i) read () (ii) string traversing (iii) open () (iv) break keyword (08 Marks)
- c. Write a python program to print the sum of the following series : $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$. 'n' is read from the user. (05 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-3

- 5 a. Write a python program to read all the lines in a file accepted from the user and print all email addresses contained in it. Assume the email addresses contain only non_white space characters. (06 Marks)
- b. Explain how to traverse and slice a list with suitable example. Also explain how to delete elements from a list with different methods. (08 Marks)
- c. Write a program progress to accept a string from user and print the frequency of each character in the string. Use Dictionary. (06 Marks)

OR

- 6 a. Given three points as list of tuples i.e., $[(x_1, y_1), (x_2, y_2), (x_3, y_3)]$, write a program to check if they are collinear. (06 Marks)
- b. Explain the following functions:
 (i) `append()` (ii) `extend()` (iii) `sort()` (iv) `keys()` and `values()` (08 Marks)
- c. Write a python program that matches a string that has an 'a' followed by zero or more 'b's'. Use Regular Expressions `search()` method. (06 Marks)

Module-4

- 7 a. Explain `__init__` method with an example. (05 Marks)
- b. What is a pure function? Write a python program to find duration of event if start and end time is given by defining class TIME. (08 Marks)
- c. Explain operator overloading. How `__add__` method is invoked when operator + used between the objects. Explain its working. (07 Marks)

OR

- 8 a. Create a Temperature class. Include two methods:
 Method 1 : `ConvertFahrenheit`-takes Celsius and print in Fahrenheit
 Method 2 : `ConvertCelsius`-takes Fahrenheit and print in Celsius
 Derive the above methods through objects of temperature class. (07 Marks)
- b. Explain `__str__` method with an example. (05 Marks)
- c. Define polymorphism. Write a class Rectangle that has attributes length and breadth and a method `area` which returns the area of the Rectangle. Also add a method `move_rectangle()` that takes an object of Rectangle class and two numbers named dx and dy. It should change the location of the rectangle by adding dx to the X coordinate of corner and adding dy to the y coordinate of corner. (08 Marks)

Module-5

- 9 a. What is socket? Explain how socket connection can be established to the internet using python code over the TCP IP connection and http protocol to get the web document. (08 Marks)
- b. Write a python code for creating employee database inserting records and selecting the employees working in the company. (08 Marks)
- c. Write a note on JSON. (04 Marks)

OR

- 10 a. Explain the significance of XML over the web development. Design a python program to retrieve a node present in XML tree. Illustrate with an example. (08 Marks)
- b. What is embedded SQL? Explain the importance of SQLite database. With suitable example, explain functions involved in creation of database table in python. (08 Marks)
- c. What is service oriented architecture? Discuss its benefits. (04 Marks)

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Introduction to Artificial Intelligence

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:
 - i) Artificial Intelligence (10 Marks)
 - ii) Agent (10 Marks)
 - iii) Search space
 - iv) Logical Reasoning
 - v) Expert tasks.
- b. What are AI problem characteristics? Explain each with an example. (10 Marks)

OR

2. a. Define production system. Discuss the different categories (characteristics) of production system. (10 Marks)
- b. There are 2 water Jugs of 3 and 4 litre. Neither has any measuring marker. There is a tap that can be used to fill the Jugs with water. Indicate how 4-litre Jug can be filled half. Solve this water – Jug problem by giving complete set of production rules and state space tree. (10 Marks)

Module-2

3. a. Briefly explain the four approaches of knowledge representation with an example. (10 Marks)
- b. List the drawbacks of propositional logic. (04 Marks)
- c. Differentiate between procedural v/s declarative knowledge. (06 Marks)

OR

4. a. Define forward and backward reasoning formulate and show the complete steps of 8-puzzle for the following data:

Start State		
2	8	3
1	6	4
7		5

⇒

Goal State		
1	2	3
8		4
7	6	5

(10 Marks)

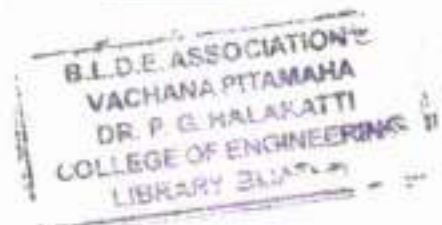
- b. Consider the following predicates:
 - i) Man (Marcus)
 - ii) Pompeian (Marcus)
 - iii) Born (Marcus, 40)
 - iv) $\forall x : \text{man}(x) \rightarrow \text{mortal}(x)$
 - v) $\forall x : \text{pompeian}(x) \rightarrow \text{died}(x, 79)$
 - vi) erupted (Volcano, 79)
 - vii) $\forall x : \forall t_1 : \forall t_2 : \text{mortal}(x) \wedge \text{born}(x, t_1) \wedge \text{gt}(t_2 - t_1, 150) \rightarrow \text{dead}(x, t_2)$
 - viii) now = 1991
 - ix) $\forall x : \forall t_1 : [\text{alive}(x, t_1) \rightarrow \neg \text{dead}(x, t_1)] \wedge [\neg \text{dead}(x, t_1) \rightarrow \text{alive}(x, t_1)]$
 - x) $\forall x : \forall t_1 : \forall t_2 : \text{died}(x, t_1) \wedge \text{gt}(t_2, t_1) \rightarrow \text{dead}(x, t_2)$

Prove that : $\neg \text{alive}(\text{marcus}, \text{now})$.

(10 Marks)

1 of 2

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-3

- 5 a. What is non monotonic reasoning? Explain the 2 approaches of default reasoning. (10 Marks)
b. Discuss the importance of truth maintenance system and their types. (10 Marks)

OR

- 6 a. Explain Dempster-Shafer theory with example. (10 Marks)
b. State and prove (Bayes) theorem for conditional probability. (10 Marks)

Module-4

- 7 a. Briefly explain the MINIMAX algorithm with example. (10 Marks)
b. Explain iterative deepening. Write algorithms for depth first iterative deepening and iterative deeping A*. (10 Marks)

OR

- 8 a. Explain the different steps in natural language understanding process. (10 Marks)
b. List and explain the various spell checking techniques. (10 Marks)

Module-5

- 9 a. Define Learning. Explain rote learning with example. (10 Marks)
b. Discuss the different learning techniques with respect to problem-solver. (10 Marks)

OR

- 10 a. You work for a software company. You receive an order to develop an expert system for movie feedback analysis. Iterate how you would efficiently design it. (10 Marks)
b. Given a chatbot how would you acquire and accumulate knowledge needed for it to work seamlessly. (10 Marks)

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Eighth Semester B.E. Degree Examination, Jan./Feb. 2023 Internet of Things Applications

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define IoT. With a neat diagram discuss the genesis of IoT in detail. (05 Marks)
- b. Discuss the different challenges of IoT. (05 Marks)
- c. Explain the One M2M IoT architecture with a neat diagram. (10 Marks)

OR

- 2 a. Describe the IoTWF standardized architecture in detail with a diagram. (10 Marks)
- b. Explain the concept of IoT Data management and Compute Stack with Fog Computing using relevant diagrams. (05 Marks)
- c. List out the defining characteristics of Fog Computing. (05 Marks)

Module-2

- 3 a. With a neat diagram explain how the actuators and sensors interact with the physical world. Classify the actuators based on energy types. (08 Marks)
- b. Explain the physical layer frame format, MAC layer frame format and security implementation in IEEE 802.15.4 technology. (12 Marks)

OR

- 4 a. Briefly discuss the various communication criteria. (06 Marks)
- b. Explain LoRaWAN architecture and MAC layer frame format with neat diagrams. (10 Marks)
- c. Explain briefly the 4 defining characteristics of smart objects. (04 Marks)

Module-3

- 5 a. Explain in detail the key advantages of IP. (08 Marks)
- b. Explain the following with respect to 6LoWPAN technology:
 - i) Header Stacks
 - ii) Header Compression
 - iii) Fragmentation
 - iv) Mesh Addressing(12 Marks)

OR

- 6 a. Explain MQTT framework and message format with neat diagrams. (08 Marks)
- b. Explain in detail CoAP communication in IoT infrastructure, CoAP message frame format and a suitable example to demonstrate reliable transmission with relevant diagrams. (12 Marks)

Module-4

- 7 a. Explain in detail the core functions of Edge streaming analytics with neat diagrams. (08 Marks)
- b. Describe the different types of data analysis results with a neat diagram. (06 Marks)
- c. Explain Lambda architecture with a neat diagram. (06 Marks)

OR

- 8 a. Explain in detail the Purdue Model for Control Hierarchy and OT Network characteristics with a neat diagram. (10 Marks)
- b. Discuss OCTAVE and FAIR formal risk Analysis structures with neat diagrams. (10 Marks)

Module-5

- 9 a. Explain the different of pin parts of Arduino UNO board with a diagram. (06 Marks)
- b. Explain Smart City Parking Architecture with a neat diagram. (08 Marks)
- c. Explain the structure of an Arduino program. (06 Marks)

OR

- 10 a. Write a program to blink an LED using Raspberry Pi. (08 Marks)
- b. Explain Smart City IoT Architecture with a neat diagram. (12 Marks)

CBGS SCHEME

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17CS82

Eighth Semester B.E. Degree Examination, Jan./Feb. 2023 Big Data Analytics

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 HDFS? List and explain the components of HDFS. (10 Marks)
b. Write the Java code for MAP and Reduce of word count problem. Describe the steps of compiling and Removing the Map Reduce program. (10 Marks)

OR

- 2 a. With example, explain the different general HDFC commands. (08 Marks)
b. Elaborate the steps required for Map Reduce parallel data flow. (06 Marks)
c. How the problem of Name Node as a single point of failure is overcome in Hadoop installations? (06 Marks)

Module-2

- 3 a. With a neat diagram describe the Two-Step Apache Sqoop and Export and import method. (10 Marks)
b. Define Apache pig. List and explain the usage modes of Apache pig. (10 Marks)

OR

- 4 a. With a neat diagram, explain Oozie DAG workflow and the types of Nodes in the workflow. (10 Marks)
b. Explain the features and benefits of Apache HIVE in Hadoop. (10 Marks)

Module-3

- 5 a. Illustrate and explain the Architecture of Data-warehouse with the help of a neat diagram. (08 Marks)
b. Why should organizations invest in business intelligence solutions? (06 Marks)
c. Draw the flow of BIDM cycle. Explain the strategic and operational decisions. (06 Marks)

OR

- 6 a. What are the objectives for graphical excellence in data visualization suggested by Tufte? Illustrate the same with an example. (08 Marks)
b. Explain CRISP-DM Data Mining cycle. (06 Marks)
c. Describe the process of selecting and cleansing of data for mining. (06 Marks)

Module-4

- 7 a. Explain the design principles of Artificial Neural Network (ANN) by constructing a model representation for a single and multilayer ANN. Describe the steps to build an ANN. (10 Marks)
b. Construct a decision tree to predict the play decision given the atmospheric conditions. (Data set – Table Q7(b)).

Outlook	Temperature	Humidity	Windy	Play
Sunny	Hot	Normal	True	?

Outlook	Temperature	Humidity	Windy	Play
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

(10 Marks)

OR

- 8 a. Discuss the three key elements which differentiate the algorithms for decision making. (08 Marks)
- b. Explain the advantages and disadvantages of Regression models. (06 Marks)
- c. Explain K-Means algorithm for clustering. (06 Marks)

Module-5

- 9 a. Explain three types of web mining. Use appropriate flow diagram to represent the same. (08 Marks)
- b. What is Naïve Bayes technique? Explain its model. (06 Marks)
- c. Discuss the application and practical consideration of social network analysis. (06 Marks)

OR

- 10 a. Explain the Text Mining process and the Architecture. (10 Marks)
- b. Compute the rank values for the network in the Fig.Q10(b). When is the highest ranked node? Solve the same with 8 iterations.

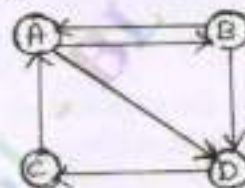


Fig.Q10(b)

(10 Marks)

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Eighth Semester B.E. Degree Examination, Jan./Feb. 2023 System Modelling and Simulation

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Assume data if necessary.*

Module-1

- 1 a. With a neat flow chart explain the various steps in a simulation study. (10 Marks)
b. Discuss the advantages and disadvantages of simulation. (10 Marks)

OR

- 2 a. Define the following terms:
i) System ii) Model iii) System state iv) Entity v) Attributes vi) List vii) Event
viii) Event notice ix) Activity x) Delay (10 Marks)
b. A grocery store has one checkout counter. Customers arrive at this checkout counter at random from 1 to 8 minutes apart and each inter-arrival has the same probability of occurrences. The service times vary from 1 to 6 minutes with probability given below.

Service time	1	2	3	4	5	6
Probability	0.10	0.20	0.30	0.25	0.10	0.05

Develop a simulation table for 10 customers. Consider the random digits for arrivals as -, 64, 112, 678, 289, 871, 583, 139, 423, 39 and service times as 84, 18, 87, 81, 06, 91, 79, 09, 64, 38 in sequence.

Find:

- i) Average waiting time of a customer
ii) Average service time
iii) Probability that a customer has to wait in the queue.
iv) Probability of idle time of the server. (10 Marks)

Module-2

- 3 a. Explain uniform distribution. (10 Marks)
b. Explain exponential distribution. (10 Marks)

OR

- 4 a. Explain queuing notation for parallel server systems. (10 Marks)
b. Discuss characteristics of queuing systems. (10 Marks)

Module-3

- 5 a. The sequence of numbers 0.44, 0.81, 0.14, 0.05, 0.93 has been generated. Use the Kolmogorov-Smirnov test with $\alpha = 0.05$ to learn whether the hypothesis that the numbers are uniformly distributed on the interval $[0, 1]$ can be rejected. [$D_\alpha = 0.565$]. (10 Marks)
b. Generate five random numbers by linear congruential method with $X_0 = 27$, $a = 17$, $c = 43$ and $m = 100$. (10 Marks)

OR

- 6 a. Suggest step by step procedure to generate random variates using inverse transform technique for exponential distribution. (08 Marks)
- b. Generate three poisson variates with mean $\alpha = 0.2$, $e^{-\alpha} = e^{-0.2} = 0.8187$. (12 Marks)

Module-4

- 7 a. Discuss suggested estimators for distributions often used in simulation. (08 Marks)
- b. Discuss four steps in the development of a useful model of input data. (04 Marks)
- c. Discuss various ways of obtaining information about a process even if data are not available. (08 Marks)

OR

- 8 a. Discuss measures of performance and their estimation. (10 Marks)
- b. Discuss types of simulations with respect to output analysis. (05 Marks)
- c. Discuss stochastic nature of output data. (05 Marks)

Module-5

- 9 a. Explain Initialization Bias in steady-state simulations and error estimation for steady-state simulations. (10 Marks)
- b. Discuss replication method for steady-state simulations and batch means for interval estimation in steady-state simulations. (10 Marks)

OR

- 10 a. Explain with neat diagram, model building, verification and validation. (10 Marks)
- b. Explain three step approach for validation process as formulated by Naylor and Finger. (10 Marks)

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18CS81

Eighth Semester B.E. Degree Examination, Jan./Feb. 2023 Internet of Things

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 IoT? Discuss the evolutionary phases of the internet with neat diagram. (06 Marks)
- b. List the difference between Operation Technology (OT) and Information Technology (IT) with their challenges. (06 Marks)
- c. Explain the M2M IoT Architecture with neat diagram. (08 Marks)

OR

- 2 a. Discuss the significant challenges and problems facing by IoT. (05 Marks)
- b. With neat diagram explain the simplified IoT architecture. (08 Marks)
- c. Describe the Fog layer in the IoT data management and computer stack with neat diagram and Fog computing characteristics. (07 Marks)

Module-2

- 3 a. Define sensors. List the different categories of the sensors. (05 Marks)
- b. Describe the different sensor types with an example. (Consider any 8 sensor type). (08 Marks)
- c. What is actuator and smart object? Explain the different characteristics of smart object. (07 Marks)

OR

- 4 a. With neat diagram explain ZigBee IP protocol stack. (10 Marks)
- b. Define LoRaWAN. Explain LoRaWAN layers with neat diagram. (10 Marks)

Module-3

- 5 a. Explain any six key advantages of the IP suite for IoT. (06 Marks)
- b. With neat diagram explain 6 LoWPAN with and without header compression. (08 Marks)
- c. Define RPL and list the different RPL routing metrics and constraints of RFC 6551. (06 Marks)

OR

- 6 a. Describe CoAP message format with neat diagram. (08 Marks)
- b. Explain MQTT message format and its types with neat diagram. (08 Marks)
- c. Explain IoT – Data Broker with an example. (04 Marks)

Module-4

- 7 a. Explain in detail how the IoT data is categorized. (06 Marks)
- b. With neat diagram explain the edge analytics processing unit with its functions. (08 Marks)
- c. Explain MPP Databases with its architecture. (06 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

- 8 a. Explain the Lambda architecture with neat diagram. (08 Marks)
- b. With neat diagram explain the OCTAVE risk assessment frameworks. (08 Marks)
- c. List the advantages of FNF. (04 Marks)

Module-5

- 9 a. Write an Arduino program to implement the traffic light simulation for pedestrians. (08 Marks)
- b. With neat diagram explain the parts of Raspberry Pi board. (08 Marks)
- c. Write a Raspberry Pi program to implement blinking an LED. (04 Marks)

OR

- 10 a. Explain in detail IoT smart parking architecture. (08 Marks)
- b. With neat diagram explain the role of the cloud for smart city applications. (10 Marks)
- c. Write a short note on Arduino. (02 Marks)

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 Python Application programming

Time: 3 hrs.

Max. Marks: 100

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

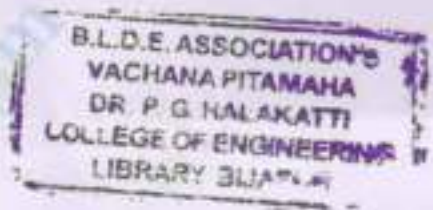
Module-1

1.
 - a. Explain the rules of precedence used by python to evaluate an arithmetic expression. Also explain the arithmetic operators used in python. (07 Marks)
 - b. With a neat diagram, explain computer hardware architecture. List and explain three types of errors encounter in python programs. (08 Marks)
 - c. Write a user defined function named "Read_age" that reads and returns age of a person. Call the function to read the age of Amar, Akbar and Antony. Print the youngest and Eldest age among three friends. (05 Marks)

OR

2.
 - a. Explain if, if-else and elif statements in python. (06 Marks)
 - b. Write a program to prompt a score between 0.0 and 1.0. If the score is out of range. Print an error. If the score is between 0.0 and 1.0, print a grade using the following table:

Score	Grade
≥ 0.9	A
≥ 0.8	B
≥ 0.7	C
≥ 0.6	D
≥ 0.5	E
< 0.5	F



- (i) Functions
 - (ii) Parameters and arguments
 - (iii) Fruitful functions and void functions
- Also write the reasons to divide the program into functions. (07 Marks)

Module-2

3.
 - a. Explain while and for loop statements in python. Write a program to display First 'n' Natural numbers using while loop. (08 Marks)
 - b. Write a python program to accept a filename from the uses :
 - (i) Display the first N-lines of the file.
 - (ii) Find the frequency of occurrences of the word accepted from the user in the file. (07 Marks)
 - c. Define string. Explain string slicing in python with examples. (05 Marks)

OR

4.
 - a. Write a python program to accept a sentence from the user and display the longest and smallest word of that sentence along with its length. (07 Marks)
 - b. Explain the following:
 - (i) read ()
 - (ii) string traversing
 - (iii) open ()
 - (iv) break keyword (08 Marks)
 - c. Write a python program to print the sum of the following series : $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$. 'n' is read from the user. (05 Marks)

Module-3

5. a. Write a python program to read all the lines in a file accepted from the user and print all email addresses contained in it. Assume the email addresses contain only non_ white space characters. (06 Marks)
- b. Explain how to traverse and slice a list with suitable example. Also explain how to delete elements from a list with different methods. (08 Marks)
- c. Write a program progress to accept a string from user and print the frequency of each character in the string. Use Dictionary. (06 Marks)

OR

6. a. Given three points as list of tuples i.e., $[(x_1, y_1), (x_2, y_2), (x_3, y_3)]$, write a program to check if they are collinear. (06 Marks)
- b. Explain the following functions:
(i) `append()` (ii) `extend()` (iii) `sort()` (iv) `keys()` and `values()` (08 Marks)
- c. Write a python program that matches a string that has an 'a' followed by zero or more 'b's'. Use Regular Expressions `search()` method. (06 Marks)

Module-4

7. a. Explain `__init__` method with an example. (05 Marks)
- b. What is a pure function? Write a python program to find duration of event if start and end time is given by defining class TIME. (08 Marks)
- c. Explain operator overloading. How `__add__` method is invoked when operator + used between the objects. Explain its working. (07 Marks)

OR

8. a. Create a Temperature class. Include two methods:
Method 1 : ConvertFahrenheit-takes Celsius and print in Fahrenheit
Method 2 : ConvertCelsius-takes Fahrenheit and print in Celsius
Derive the above methods through objects of temperature class. (07 Marks)
- b. Explain `__str__` method with an example. (05 Marks)
- c. Define polymorphism. Write a class Rectangle that has attributes length and breadth and a method area which returns the area of the Rectangle. Also add a method `move_rectangle()` that takes an object of Rectangle class and two numbers named dx and dy. It should change the location of the rectangle by adding dx to the X coordinate of corner and adding dy to the y coordinate of corner. (08 Marks)

Module-5

9. a. What is socket? Explain how socket connection can be established to the internet using python code over the TCP IP connection and http protocol to get the web document. (08 Marks)
- b. Write a python code for creating employee database inserting records and selecting the employees working in the company. (08 Marks)
- c. Write a note on JSON. (04 Marks)

OR

10. a. Explain the significance of XML over the web development. Design a python program to retrieve a node present in XML tree. Illustrate with an example. (08 Marks)
- b. What is embedded SQL? Explain the importance of SQLite database. With suitable example, explain functions involved in creation of database table in python. (08 Marks)
- c. What is service oriented architecture? Discuss its benefits. (04 Marks)

18CS51

CBGS SCHEME

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18CS51

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 Herzberg'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)

1 of 2

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

- 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)

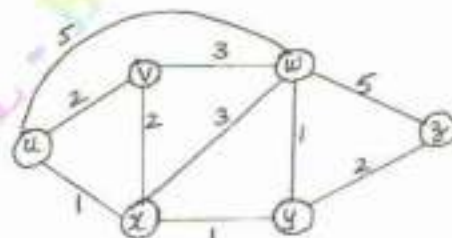


Fig Q.6(a)

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

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-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 (10 Marks)
- iv) Canned transaction v) Data Manipulation Language (DML).

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)

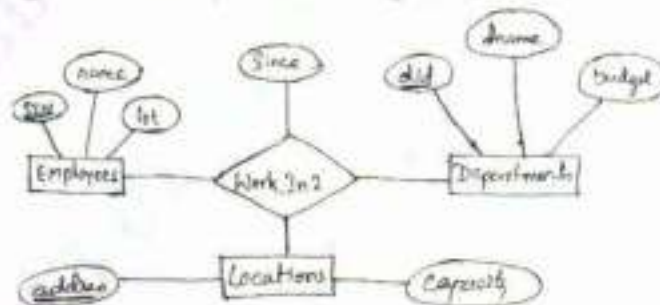


Fig. Q3(c)

OR

- 4 Considered the COMPANY DATABASE
 EMPLOYEE (Fname, Minit, Lname, Ssn, Bdate, 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)

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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 $L = \{m(ab + ba) \mid m \in \{a, b\}^*\}$
 - iii) To accept $L = \{obab \mid o \in \{a, b\}^*\}$ (10 Marks)
- b. Define distinguishable and indistinguishable states. Minimize the following DFSM.

δ	0	1
\rightarrow A	B	A
B	A	C
C	D	B
\bullet 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 $\Sigma = \{a, b\}$
 - (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)].

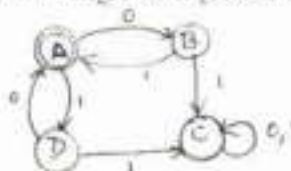


Fig.Q3(a)

(05 Marks)

- b. State and prove pumping Lemma theorem for regular languages. Show that $L = \{a^n b^n \mid n \geq 0\}$ 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) $L = \{ a^n b^m c^p \mid n \leq 4, m \geq 2, p \leq 2 \}$
 - (ii) $L = \{ \omega \mid |\omega| \bmod 3 = 0 \ \& \ \omega \in \{a, b\}^* \}$
 - (iii) $L = \{ a^m b^n \mid m + n \text{ is even} \}$ (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
 $L = \{ \omega \omega^R \mid \omega \in (a, b)^* \}$ where ω^R is reverse of ω }
 and show the moves made by PDA for the string "aabcbbaa" and "abacbbba". (10 Marks)
- b. Define Leftmost derivation, Rightmost derivation and Parse tree. Consider the grammar.
- $$S \rightarrow AbB \quad A \rightarrow aA \mid \epsilon$$
- $$B \rightarrow aB \mid bB \mid \epsilon \quad D \rightarrow a \mid \epsilon$$
- 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) $L = \{ 0^m 1^n 2^k \mid m \geq 1 \text{ and } n \geq 0 \}$
 - (ii) $L = \{ \omega \omega^R \mid \omega \in (a, b)^* \}$
 - (iii) $L = \{ a^n b^m c^k \mid n+2m = k \text{ for } m \geq 0 \text{ and } n \geq 0 \}$ (10 Marks)
- b. Define CNF. Convert the following CFG into CNF.
- $$S \rightarrow ASB \mid \epsilon \quad A \rightarrow aAS \mid a \quad B \rightarrow SbS \mid A \mid bb$$
- (10 Marks)

Module-4

- 7 a. Define TM and design a turing machine for $L = \{ \omega \mid \omega \in (0+1)^* \text{ containing the substring } 001 \}$
 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 $L = \{ 0^n 1^n \mid n \geq 1 \}$. 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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Question Paper Version : B

Fifth Semester B.E Degree Examination, Jan./Feb. 2023

Environmental Studies

(COMMON TO ALL BRANCHES)

Time: 2 hrs.]

[Max. Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **hundred** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners on the OMR sheets are strictly prohibited.**

-
1. The Karnataka State Pollution Control Board (KSPCB) was established in the year.
a) 1974 b) 1982 c) 1973 d) 1983
 2. Which of the following is not a part of the hydrological cycle?
a) Precipitation b) Infiltration
c) Transpiration d) Perspiration
 3. First International Earth Summit was hold at
a) USA b) Russia
c) Rio-de-Janerio d) Johannesburg
 4. Which among the following has highest percentage of calorific value?
a) Anthracite b) Peat
c) Lignite d) Bituminous coal
 5. Nitrogen fixing bacteria exists in
a) Leaf b) Stem
c) Roots d) Flower
 6. The two major components of ecosystem are
a) Adiabatic and isotropic b) Ecologic and climatologic
c) Cyclic and biologic d) Abiotic and biotic
 7. Geothermal energy is a
a) Heat energy b) Wind energy
c) Current energy d) Solar energy

8. The average life expectancy around the world is currently,
a) Decreasing
b) Increasing
c) Stabilizing
d) Not changing
9. The universal declaration of Human Rights was proclaimed by the UN in the year.
a) 1946
b) 1947
c) 1948
d) 1949
10. The objective of Integrated Child Development Service (ICDS) are
a) Immunization
b) Health check up and referral services
c) Pre-school non formal education
d) All of these
11. GIS stands for
a) Geostationary Interact Sector
b) Geographical Information System
c) Geotechnical Information Society
d) Geothermal Investigation Site
12. LPG is a mixture of
a) N_2 and H_2S
b) CO_2 and N_2
c) Propane and butanes
d) Methane and CO_2
13. The Tiger Conservation Project was started in
a) 1973
b) 1975
c) 1981
d) 2000
14. The leader of "Chipko Movement" is
a) Sunderlal Bahuguna
b) Medha Patkar
c) Vandana Shiva
d) Mahatma Gandhi
15. Which of the following is the source of Fly-ash?
a) Vehicular exhaust
b) Sewage
c) Thermal power plant
d) All of these
16. The permissible range of pH for drinking water as per the Indian Standard is
a) 6 to 9
b) 6.5 to 8.5
c) 6 to 8.5
d) 6.5 to 7.5
17. Water logging is a phenomena in which
a) Water patterns are rotated
b) Soil root zone becomes saturated due to over irrigation
c) Erosion of soil
d) Soil degradation
18. Carbon content is higher in
a) Living matter
b) Soil
c) Water
d) Atmosphere
19. Springs means
a) Surface water
b) Atmosphere water
c) Both (a) and (b)
d) Ground water
20. Bio-remediation means deliberately introducing micro organisms to break pollutants.
a) Soil
b) Waste water
c) Ground water
d) Both soil and groundwater

21. In geosynchronous orbit altitude of the satellite is about
 - a) 36,000 kms
 - b) 10,000 kms
 - c) 50,000 kms
 - d) None of these
22. The Air (Prevention and Control of Pollution) Act was enacted in the year.
 - a) 1987
 - b) 1981
 - c) 1991
 - d) 1988
23. Kudremukh Iron ore mine, Karnataka was closed due to
 - a) River pollution and threat to biodiversity
 - b) Land encroachment
 - c) Radioactive hazards
 - d) Serious health hazard
24. On the eve of Gandhi Jayanthi which andolan was launched by our Honorable Prime Minister
 - a) Swedeshi
 - b) Sarvashikshana Abhiyana
 - c) Suvamagrama
 - d) Swach Bharath
25. An international agreement signed in the year 1987, to protect stratospheric ozone is known as
 - a) Montreal protocol
 - b) Kyoto protocol
 - c) Earth summit
 - d) None of these
26. The explosion of First Atomic Bomb was done in Hiroshima and Nagasaki in
 - a) 1946
 - b) 1986
 - c) 1945
 - d) 1947
27. A dangerous pesticide which has been reported to cause physical deformities to people of Kerala and Karnataka states
 - a) Endosulfan
 - b) Fluorides
 - c) DDT
 - d) Dioxygene
28. Visible portion of EMR ranges between
 - a) 0.4 - 0.76 μm
 - b) 10.5 - 12.5 μm
 - c) 8.0 - 14.0 μm
 - d) None of these
29. Data representation in Raster data is by
 - a) pixel
 - b) points, lines and polygon
 - c) latitude and longitude
 - d) none of these
30. In water treatment, alum is used for
 - a) softening
 - b) coagulation
 - c) filtration
 - d) disinfection
31. Among the fresh water available in the earth the percentage of surface water is about
 - a) 50%
 - b) 10%
 - c) 5%
 - d) less than 1%
32. Hepatitis is caused by
 - a) Protozoa
 - b) Virus
 - c) Bacteria
 - d) Fungus
33. In India groundwater resources are rich in
 - a) Plains of river Kaveri and Krishna
 - b) The Deccan plateau
 - c) The Gangetic plains
 - d) The plains of Netravati and Kapila
34. The required iron content in drinking water as specified by BIS is
 - a) 300 mg/l
 - b) 30 mg/l
 - c) 3 mg/l
 - d) 0.30 mg/l

35. Molasses from sugar industry is used to generate
 a) Biodiesel
 b) Hydrogen
 c) Bioethanol
 d) Biomethanol
36. Wind Farms are located in
 a) River basin
 b) Plain area
 c) Hilly area
 d) Valley area
37. Biomass consists of
 a) Lignin
 b) Hemi cellulose
 c) Cellulose
 d) All of these
38. Natural gas contains
 a) Carbon dioxide
 b) Hydrogen
 c) Methane
 d) Nitrogen
39. Anti tobacco day is mentioned on
 a) 31st May
 b) 30th June
 c) 31st July
 d) 31st August
40. Population explosion will cause
 a) Socio-Economic Problems
 b) Food Scarcity
 c) Energy crises
 d) All of these
41. Which of the following element make e-waste hazardous in nature?
 a) Land
 b) Glass
 c) Plastic
 d) Iron
42. What is the hazardous pollutant released from batteries?
 a) Arsenic
 b) Barium
 c) Cobalt
 d) Cadmium
43. What is the term used for reuse of sewage sludge?
 a) Compost
 b) Solids
 c) Biosolids
 d) Sludge
44. Reduction in brightness of the famous Taj Mahal is due to
 a) Global warming
 b) Air pollution
 c) Ozone depletion
 d) Afforestation
45. E.I.A. can be expanded as
 a) Environment and Industrial Act
 b) Environment of Impact Activities
 c) Environmental Impact Assessment
 d) Environmentally Important Activity
46. Organic Farming is
 a) Farming without using pesticides and chemical fertilizer
 b) Enhances biodiversity
 c) Promotes soil biological activity
 d) All of these
47. Bio-remediation means the removal of contaminants from
 a) Soil
 b) Wastewater
 c) Groundwater
 d) Both soil and ground water

48. Plants use _____ gas for photosynthesis.
 a) Oxygen
 b) Methane
 c) Nitrogen
 d) Carbon dioxide
49. What is the maximum allowable concentration of fluorides in drinking water?
 a) 1.0 mg/l
 b) 1.25 mg/l
 c) 1.50 mg/l
 d) 1.75 mg/l
50. Forest rich area in Karnataka is found in _____.
 a) Western Ghats
 b) Bandipur
 c) Nagarhole
 d) Mangalore
51. "Minamata Disease" is caused due to
 a) Lead
 b) Arsenic
 c) Mercury
 d) Cadmium
52. Alternative eco-friendly fuel for automobiles is
 a) Petrol
 b) Diesel
 c) CNG
 d) Kerosene
53. Population explosion will cause
 a) Biodiversity
 b) Stress on ecosystem
 c) More employment
 d) None of these
54. Which of the following is having high population density?
 a) India
 b) China
 c) USA
 d) Western Europe
55. Demography is the study of
 a) Animals behaviour
 b) Population growth
 c) River
 d) None of these
56. Forest are called as _____.
 a) Air purifier
 b) Earth's lungs
 c) Oxygen reservoir
 d) CO₂ absorbers
57. Which of the following is the facility that the urban people enjoy?
 a) Better quality of air
 b) Better communication access
 c) Large land at cheap rates
 d) None of these
58. Which of the following is an air pollutant?
 a) Carbon dioxide
 b) Oxygen
 c) Nitrogen
 d) Particulate matter
59. Cyto toxic and expired drugs are disposed of by
 a) damping
 b) autoclave
 c) incineration
 d) chemical disinfection
60. The colour code of plastic bag for disposing of microbial laboratory culture waste.
 a) Black
 b) Red
 c) Blue
 d) White
61. South Africa is leading exporter of which mineral?
 a) Copper
 b) Diamond
 c) Silver
 d) Gold

62. The word 'sustainable development' came into existence in the year.
 a) 1992 b) 1978 c) 1980 d) 1987
63. The other word of landscaping is
 a) Reduction b) Restoration
 c) Removing topsoil d) Restore
64. Cloud seeding with silver iodide is based on the
 a) Bergeron process b) Collision-coalescence process
 c) Both a and b d) None of these
65. Environmental pollution is due to
 a) Rapid urbanization b) Deforestation
 c) Afforestation d) a and b
66. The liquid waste from bathroom and kitchen is called
 a) Sullage b) Domestic sewage
 c) Storm water d) Runoff
67. BOD means
 a) Biochemical Oxygen Demand b) Chemical oxygen demand
 c) Biophysical Oxygen Demand d) All of these
68. Which of the following source is surface water?
 a) Springs b) Streams
 c) Deep wells d) All of these
69. Which of the following is biodegradable?
 a) Plastics b) Domestic sewage
 c) Detergents d) a and c
70. Blaring sounds known to cause
 a) Mental distress b) High cholesterol
 c) Neurological problems d) All of these
71. Eutrophication is
 a) an improved quality of water in lakes
 b) a process in carbon cycle
 c) the result to accumulation of plant nutrients in water bodies
 d) a water purification technique
72. Primary consumer is
 a) Herbivores b) Carnivores
 c) Macro consumers d) Omnivores
73. Which among the following is a climatic factor?
 a) pressure b) humidity
 c) temperature d) all of these
74. Biodiversity can be broadly classified into how many types?
 a) 2 b) 5 c) 3 d) 4

75. Hot spot areas have
 a) Low density of biodiversity
 b) Only endangered plants
 c) High density of hot springs
 d) High density of biodiversity
76. About _____ % of the earth's surface is covered by water.
 a) 53% b) 19% c) 71% d) 90%
77. Deforestation means
 a) preservation of forests
 b) destruction of forests
 c) monocrop cultivation
 d) agriculture
78. When did National Disaster Management Authority formed?
 a) 2000 b) 2005 c) 2010 d) 2015
79. Disaster is an event arising out of
 a) result of hazard event
 b) causes of hazard event
 c) causes of disaster event
 d) all of these
80. The scientific study of earthquake is called
 a) seismograph
 b) seismology
 c) both a and b
 d) none of these
81. World Environmental day is held every year on
 a) June 5th b) October 2nd c) April 22nd d) November 1st
82. Ozone layer thickness is measured in _____
 a) mm b) cm c) Dobson unit d) Db
83. First of the major environmental protection acts to be promulgated in India was
 a) The Water Act
 b) The Air Act
 c) The Environment Act
 d) Noise Pollution Rules
84. Blue baby syndrome is caused due to _____
 a) Manganese b) Ozone c) Silver d) Nitrate
85. World Earth's day is annually celebrated on
 a) April 22nd b) June 5th c) January 1st d) May 1st
86. The most important fuel used by nuclear power plant is
 a) U-235 b) U-238 c) U-245 d) U-248
87. Which of the following is a biotic component of ecosystem?
 a) Fungi
 b) Solar light
 c) Temperature
 d) Humidity
88. Abiotic component includes
 a) Soil
 b) Temperature
 c) Water
 d) All of these
89. The word "Environment" is derived from
 a) Greek
 b) French
 c) Spanish
 d) English

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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)

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, $42 \div 8 = 50$, will be treated as malpractice.

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 `__str__()` 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.

l	Census tract	State	County	POP2010
9841	06075010500	CA	SanFrancisco	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)

CBCS SCHEME

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18CS56

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 commands, 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 f₁-C f₂-C f₃-C cprogs
iii) if my pwd is /home/ravi/progs then Cd ../
iv) ls -l | wc -l
v) cp f₁ f₂ f₃ files
vi) rm -i chap1
vii) cat >> test.txt
viii) mkdir 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\[0-9]. (05 Marks)
d. Explain the grep command with all its options. (05 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 equities written, e.g., A2+K-50, will be treated as malpractice.

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.
- `grep "Anil" std-1st || echo "pattern not found"`
 - `test $x -gt $y`
 - `[-Z $stg]`
 - `[-r $file]`
 - `[! -n $stg]`
- c. Explain all the looping statements with syntax. (05 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 pat₁ pat₂ pat₃ pat₄ pat₅]. (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)
