

## INSTRUCTIONS:

- (1) Question 1 is compulsory.
- (2) Attempt any **three** from the remaining questions.
- (3) Draw neat diagrams wherever necessary.

Q.1

5 marks each

- (a) From above given probability distribution find P (Cavity | Toothache)

	Toothache		¬ Toothache	
	Catch	¬ Catch	Catch	¬ Catch
Cavity	0.108	0.012	0.072	0.008
¬ Cavity	0.016	0.064	0.144	0.576

- (b) Explain the Centroid method of Defuzzification with a suitable diagram?
- (c) Describe Deep Learning concept with an example.
- (d) Describe in detail Holdout method and Random subsampling?

Q.2

10 marks each

- (a) How to improve the classification accuracy of class-Imbalanced data. Explain with suitable examples.
- (b) Define Cognitive Computing. Draw a neat diagram of elements of the cognitive system and explain the elements.

Q.3

10 marks each

- (a) Explain the components of CNN architecture.
- (b) What is Multi modal application? Explain the Data Science for Multi modal applications.

Q.4

10 marks each

- (a) Consider two fuzzy sets.

$$A = \left\{ \frac{0.2}{1} + \frac{0.3}{2} + \frac{0.4}{3} + \frac{0.5}{4} \right\}$$

$$B = \left\{ \frac{0.1}{1} + \frac{0.2}{2} + \frac{0.2}{3} + \frac{0.1}{4} \right\}$$

Find the algebraic sum, algebraic product, bounded sum, and bounded difference of the given fuzzy sets and also describe properties of fuzzy sets.

- (b) Illustrate inferencing in Bayesian Belief Network with an example.

Q.5

10 marks each

- (a) List steps in building a typical cognitive application. Explain the same for Healthcare application.
- (b) Illustrate the autoencoder with architecture diagram.

Q.6

10 marks each

- (a) Calculate Accuracy, Precision, Recall, Sensitivity and Specificity for the following example.

Actual Class \ Predicted Class	Cancer=yes	Cancer=no
Cancer=yes	90	210
Cancer=no	140	9560

- (b) Write a short note on- Trends in Data Science.

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[3 Hours]

[80 Marks]

- Note : 1. Question 1 is compulsory  
2. Answer any three out of remaining questions  
3. Assume suitable data where required

Q1 Solve any 4

- |   |   |
|---|---|
| a) Define IOT with Conceptual Framework                   | 5 |
| b) Compare and contrast RFID with Bluetooth               | 5 |
| c) What are the four big data strategies?                 | 5 |
| d) Explain IoT Data Analytics importance                  | 5 |
| e) Illustrate the components of IEEE 802.11 architecture. | 5 |

Q2

- |  |    |
|--|----|
| a) Describe IoT World Forum (IoTWF) Standardized Architecture. | 10 |
| b) Explain the concept of Fog Computing with Diagram.          | 10 |

Q3

- |  |    |
|--|----|
| a) Draw and explain Architecture of MQTT with diagram.         | 10 |
| b) Explain the role of NoSQL in IoT Data Analytics Challenges. | 10 |

Q4

- |   |    |
|---|----|
| a) Discuss Various IoT Application Transport Methods.         | 10 |
| b) Design the Forest Fire Detection system using IoT sensors. | 10 |

Q5

- |  |    |
|--|----|
| a) Explain the architecture of LoRaWAN with its major Characteristics. | 10 |
| b) What is the purpose of using a dashboard for data visualization?    | 10 |

Q6

- |   |    |
|---|----|
| a) Explain ecosystem for IoT enabled Smart Home with respect to sensors, actuators, framework, protocols, storage, data analysis, security etc. | 10 |
| b) Write short note on i) CoAP ii) Internet of Behaviour.   | 10 |

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Time 3 Hours

[Total Marks 80]

N. B.: 1. Question No. 1 is compulsory.

2. Solve any THREE from Question No. 2 to 6.

3. Draw neat well labelled diagram wherever necessary.

Q. 1 Answer any four

- a) Describe various password cracking attacks (05)
- b) Explain Business Continuity plan. (05)
- c) How does SSH help to achieve security. (05)
- d) Differentiate between OAuth and SAML. (05)
- e) Explain buffer overflow attack along with its causes. (05)

- Q. 2 a) Explain different types of Email Attacks (10)
- b) Explain different mobile device security threats in detail. (10)

- Q. 3 a) How Bell-LaPadula model work to achieve access control. (10)
- b) Explain in detail Enterprises Mobility Management EMM with its components. (10)

- Q. 4 a) What is VPN and what are different security concerns? (10)
- b) Explain in detail steps involved in risk analysis. (10)

- Q. 5 a) Explain Multilevel database security models in detail. (10)
- b) Explain penetration testing stages. (10)

- Q. 6 a) Explain File protection system in software security. (10)
- b) Discuss the Cloud Identity and Access Management and its importance. (10)

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Duration: 3hrs

[Max Marks:80]

- N.B. : (1) Question No 1 is Compulsory.  
 (2) Attempt any three questions out of the remaining five.  
 (3) All questions carry equal marks.  
 (4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR

[20]

- Define each software testing terminology:  
 i) Failure, ii) Defect, iii) Error, iv) Testware and v) Test oracle.
- What is Mutation testing? Differentiate between primary and secondary mutants.
- What criteria you will consider for selection of test tools for automation Testing.
- Explain structure of testing Group.
- Discuss Six Sigma.

2 a Consider a project with the following distribution of data and calculate its defect spoilage.

SDLC Phase	No. of Defects	Defect Age
Requirement Specs.	34	2
HLD	25	3
LLD	17	7
Coding	10	8

[10]

b Explain Agile Testing Life Cycle and its challenges.

[10]

3 a A program reads three numbers A, B and C, within the range [1,100] and prints the minimum number. Design test cases for this program using BVC and Robust testing methods.

[10]

b What is the need of software measurement? Discuss the various types of software metrics.

[10]

4 a What is the need of automation testing activities? Differentiate between static and dynamic tools?

[10]

b Consider following C code.

[10]

```
main()
{
    int number, index;
    1. printf("Enter a number");
    2. scanf("%d",&number);
    3. index=2;
    4. while(index<=number-1)
```

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```
5. {  
6.   if(number%index==0)  
7.   {  
8.       printf("Not a prime number");  
9.       break;  
10.  }  
11.  index++;  
12. }  
13. if(index==number)  
14.   printf("prime number");  
15. } // end main
```

Draw DD graph, Calculate cyclomatic complexity, List out independent paths and design test cases.

- 5 a What are the components of a test plan? Illustrate test plan hierarchy with a neat diagram. [10]  
b Explain McCall's Quality factors and Criteria. [10]
- 6 a Explain a bug life cycle with a neat diagram in detail. List down the states of a bug. [10]  
B Differentiate between Effective Software Testing and Exhaustive Software Testing. [10]

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(3 Hours)

(Total Marks : 80)

Please check whether you have got the right question paper.

N.B.:

- 1) Question No. 1 is compulsory.
- 2) Attempt any 3 questions from the remaining.
- 3) Make suitable assumptions wherever necessary.

1. a. Write down the Algorithm steps of Mixed Reality. 10  
b. List and discuss applications of Augmented Reality and Virtual Reality (AR-VR) in detail. 5  
c. Differentiate between Mixed Reality and Immersive Reality. 5
2. a. Discuss briefly Visual perception and spatial Display Model. List the characteristics of Tracking Technology. 10  
b. What do you mean by Augmentation? Describe the methods of Augmentation. 10
3. a. Discuss the Multi View Interfaces and Tangible Interfaces. 10  
b. What are all requirements of AR-Authoring? Briefly explain stand-alone Authoring Solutions. 10
4. a. Explain how does homogenous co-ordinate system simplifies geometric transformation in computer graphic with example. Write the Merits of using it. 10  
b. Discuss Viewport Transformation. How does it simplifies the process in virtual reality? 10
5. a. Discuss in detail VRML. 10  
b. Explain the classic component of VR System. 10
6. Write short note on (any two) : 20
  - a. Eye movement and issues with it in VR
  - b. Depth and motion perception
  - c. Tilt and Yaw drift correction.

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[Time: 3 Hours]

[ Marks:80]

- N.B:
1. Q 1 is compulsory.
  2. Attempt any three from the remaining five questions.
  3. Each Question carries equal marks.

- Q.1 Answers all 20
- a) Explain logical view of a document with diagram.
  - b) Differentiate between data retrieval and information retrieval.
  - c) How does search engine retrieves the information?
  - d) Describe metasearchers and it merits with example.
- Q.2 Answers all 20
- a) Explain taxonomy of information retrieval model with classification diagram.
  - b) Explain various phases of text preprocessing within a document. Discuss any one application for same.
- Q.3 Answers all 20
- a) Discuss Huffman Algorithm in detail with suitable example.
  - b) What is the purpose of using keyword based query? Briefly explain any 3 types of keyword based queries.
- Q.4 Answers all 20
- a) What is human-computer interaction? List and discuss any four design principles of human computer interaction.
  - b) Describe the process of creating inverted index with example. How this process can be optimized using block addressing?
- Q.5 Answers all 20
- a) What is starting point? Explain list of collections and overviews in detail.
  - b) Discuss sequential searching. Explain any one algorithm used in sequential searching.
- Q.6 Write a note on: (Any two) 20
- a) Interface support for the search process
  - b) Multimedia indexing approach
  - c) Document clustering

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Duration: 3hrs

[Max Marks: 80]

- N.B. :** (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any FOUR [20]
- a Differentiate between cybercrime and cyber fraud.
  - b Explain various threats associated with cloud computing.
  - c Explain methods of password cracking
  - d Explain E-contracts and its different types.
  - e Explain different attack vectors in cyber security
- 2 a Explain the classification of cybercrimes with examples. [10]  
b Explain various types of credit card frauds [10]
- 3 a Explain different buffer overflow attacks also explain how to mitigate buffer overflow attack [10]  
b Explain electronic banking in India and what are laws related to electronic banking in India [10]
- 4 a What do you understand by DOS and DDOS attack? Explain in detail. [10]  
b Write a note on Intellectual Property Aspects in cyber law. [10]
- 5 a Explain the objectives and features of IT Act 2000 [10]  
b What are Botnets? How it is exploit by attacker to cause cyber attack? [10]
- 6 a Explain SQL injection attack. State different countermeasure to prevent the attack. [10]  
b Explain what is Information Security Standard and Explain HIPAA act in detail [10]

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B.E./SEM VIII/IT/C-2019

Nov-Dec 2022

Time: 3 Hours

Max Marks:80

- Note: 1. Q1 is compulsory  
2. Solve any three from remaining

- Q1 Solve **any four** questions 20
- A. Role of science & Technology in Sustainable design of products
  - B. Simultaneous engineering
  - C. Explain Product design for Environment.
  - D. What is PLM? State its need and scope and phases.
  - E. What is digital mockup? State its benefits and list software used for it.
- Q.2 A. What do you mean by Design for X. How will you use design for X tools in the design process? 20
- B. Explain useful life extension strategies.
- Q.3 A. Explain the general framework of LCCA. 20
- B. What is sustainable development? Explain role of science & technology in it.
- Q.4 A. Discuss new product development process 20
- B. Explain cost analysis and life cycle approach in detail.
- Q.5 A. Explain the strategies for recovery at the end-of-life cycle 20
- B. What is the virtual product development process? Write its applications and advantages.
- Q.6 A. Explain the product life cycle in detail with suitable example 20
- B. Explain various reasons for implementation of PDM system. Explain various barriers for PDM implementation

Duration: 3hrs

[Max Marks: 80]

- N.B. :** (1) Question No 1 is Compulsory.  
 (2) Attempt any three questions out of the remaining five.  
 (3) All questions carry equal marks.  
 (4) Assume suitable data, if required and state it clearly.

- 1 Attempt any **FOUR** [20]
  - a What are the different types of MIS? [05]
  - b How is data governance achieved in case of MIS? [05]
  - c Analyse briefly to highlight the difference between Web 2.0 and Web 3.0? [05]
  - d Evaluate the MIS Hierarchy to comment on Decision Support System. [05]
  - e List the main difference between Wireless and Wired Technologies? [05]
- 2 a Give an understanding on types of Control to achieve Security. [10]
  - b What is Mobile Commerce? What are the new challenges that it has introduced in business? [10]
- 3 a What do you mean by CRM? Give its types and relate the role of SC on CRM. [10]
  - b What is Data Mart and Data Warehouses? Give two examples which show generation of Big Data. [10]
- 4 a Write short notes on (1) TPS (2) ERP [10]
  - b Evaluate the role of Confidentiality, Integrity and Availability in order to achieve security. [10]
- 5 a What is the need of Social Computing for Businesses? [10]
  - b Create MIS system for any hospital. [10]
- 6 a What is Big Data? What are the various challenges and characteristics of Big Data? [10]
  - b Describe various Cloud Computing Models and highlight their evolution. [10]

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