

Duration: 3 hours

Max. Marks: 80

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

2) Attempt any THREE questions out of remaining FIVE questions.

3) Figures to the right indicates full marks.

4) Assume suitable data if necessary.

- Q1 Attempt any FOUR of the following 20**
- a What are Mobile Vulnerabilities?
  - b What are different Security Risks for Organizations?
  - c Difference between virus and worm.
  - d How cybercrimes differ from most terrestrial crimes?
  - e Explain the objectives of IT Act 2000.
- Q.2**
- a What is WIPO? List treaties prepared by WIPO. 10
  - b Explain about the impact of Cybercrimes in Social Engineering. 10
- Q.3**
- a Explain steps for SQL Injection attack. How to prevent SQL Injection attacks? 10
  - b Explain E-contracts and its different types. 10
- Q.4**
- a What is Cybercrime? Who are Cybercriminals? Explain 10
  - b What is e-commerce? Discuss types of e-commerce. 10
- Q.5**
- a What are basic security precautions to be taken to safeguard Laptops and Wireless devices? Explain. 10
  - b What are illegal activities observed in Cyber Cafe? What are safety and security measures while using the computer in Cyber Cafe? 10
- Q.6 Write short notes on any FOUR 20**
- a Digital evidence
  - b HIPAA
  - c Buffer overflow attack
  - d Planning of cyberattacks by criminal.
  - e Vishing attack
  - f Trojan horse and backdoor
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N.B

1. Q.1 is compulsory
2. Attempt any three from the remaining five questions.
3. Assume suitable data, if required and state it clearly.

Q 1 Attempt all. (20 marks)

- a. Recall objectives of Information Retrieval Process
- b. Differentiate between Information versus Data Retrieval.
- c. Identify the various task performed by web search engine.
- d. Importance of metadata and its types.

Q 2. Attempt all. (20 marks)

- a. Show taxonomy of IR models and recall browsing models in detail.
- b. Consider a very small collection C that consists in the following three documents:
  - d1: "beautiful garden"
  - d2: "evening garden time"
  - d3: "garden time is beautiful"

Given the following query: "garden time", calculate the rank of each document using vector space retrieval model. (Use tf-idf vector for the query, and compute the score of each document in C relative to this query, using the cosine similarity measure.)

Q3. Attempt all. (20 marks)

- a. Explain Boolean Models in detail with example.
- b. Explain Natural language modelling issues and its solution

Q.4. Attempt all. (20 marks)

- a. What is the purpose of using keyword based query? Briefly explain any 3 types of keyword based queries.
- b. Apply Boyer Moore algorithm to construct bad match table and find the index of the given pattern for the string below with steps

**String: STUDENTS ARE SMART I LIKE SMART STUDENTS**

**Pattern: SMART**

Q 5. Attempt all. (20 marks)

- a. Summarize various visualization techniques with respect to user interface design.
- b. Construct a Suffixes, suffix trie and suffix tree, suffix array and supra index for the above sample text.

**Roses are red. Red roses are beautiful. Many people like red roses.**

Q 6. Write short note on (20 marks)

- a. Different types of Information Systems
- b. Different markup languages and its applications.

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[3 hrs]

[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 four

- a) Define Smart Object in IoT and its characteristics. **5 marks**
- b) Write short note on RFID **5 marks**
- c) Draw the Architecture diagram of Advanced Message Queuing Protocol (AMQP) with advantages **5 marks**
- d) Explain the importance of IoT Data Analytics. **5 marks**
- e) Explain data acquisition in IoT. **5 marks**

**Q2**

- a) Describe IoT World Forum (IoTWF) standardized architecture. **10 marks**
- b) State various operating modes of Zigbee and its topologies with diagrams. **10 marks**

**Q3**

- a) Draw and explain the architecture of MQTT with diagram. **10 marks**
- b) Explain working of Constraint Application Layer protocol (CoAP). **10 marks**

**Q4**

- a) Illustrate the following i) How to create and visualize alerts in IoT? **10 marks**  
ii) What are the main challenges of IoT?
- b) Explain the following terms: i) CoAP ii) Internet of Behaviour **10 marks**

**Q5**

- a) Explain the architecture of LoRaWAN with its major characteristics. **10 marks**
- b) Design the Forest Fire Detection system using IoT sensors. **10 marks**

**Q6**

- a) Describe IoT enabled Smart Home Automation. **10 marks**
  - b) Explain the role of NoSQL in IoT data analytics. **10 marks**
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**Time : ( Three Hours)**

**Total Marks: 80**

- Note: 1. Q1 is compulsory  
2. Solve any three from remaining  
3. Assume suitable data wherever required

- |        |   |           |
|--------|---|-----------|
| Q.1    | Write notes on. <b>(Any Four)</b>   | <b>20</b> |
|        | a) Product Lifecycle Phases   |           |
|        | b) Reason for implementing a PDM system   |           |
|        | c) Tools for virtual product development  |           |
|        | d) Methodological Evolution in Product Design   |           |
|        | e) Model analysis   |           |
|        | f) General framework for LCCA   |           |
| Q.2 a. | State and explain end of life cycle strategies.   | <b>10</b> |
| b.     | Define PDM. What are the barriers to PDM implementation.  | <b>10</b> |
| Q.3 a. | Define Change Management. Why Change Management is important in PLM?                            | <b>10</b> |
| b.     | Explain the Product Design Process and its phases in the Development Process.                   | <b>10</b> |
| Q.4 a. | Explain phases of Life Cycle Analysis in ISO Standards  | <b>10</b> |
| b.     | Explain the Role of FEM and CAD in VPD.   | <b>10</b> |
| Q.5 a. | What is New Product Development (NPD)? Explain its Strategies.                                  | <b>10</b> |
| b.     | Importance of Product Design in the Context of the Product Development Process.                 | <b>10</b> |
| Q.6 a. | Define Life Cycle Assessment (LCA). Explain the fields of Application of Life Cycle Assessment. | <b>10</b> |
| b.     | Define Design for Environment. Explain the guidelines for design for environment.               | <b>10</b> |

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**(3 Hours)**

**[Marks: 80]**

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

**2) Answer any three out of the remaining questions.**

**3) Assume suitable data if necessary.**

**4) Figures to the right indicate full marks.**

**Q1. Attempt any FOUR**

**(20)**

- (a) Differentiate between Effective Software Testing vs Exhaustive Software Testing.
- (b) Explain Acceptance Testing.
- (c) What are the benefits of Test Suite Minimization?
- (d) Explain the cost incurred in Automation testing tools.
- (e) Compare Traditional Software Testing and Web based Software Testing..

Q2 (a) Explain the verification of Requirements and Objectives in Software testing. (10)

Q2 (b) A program reads an integer number within the range [1,100] and (10)  
determines whether it is a prime number or not. Design test cases for this program using  
BVC, robust testing, and worst-case testing methods.

Q3 (a) Explain in detail the Structure of Testing Group. (10)

Q3 (b) Explain any two Automation tools in detail. (10)

Q4 (a) Explain Agile Testing Life Cycle, along with the challenges in Agile Testing. (10)

Q4 (b) Explain McCall's quality factors and Criteria (10)

Q5 (a) What are graph metrics? Explain with an example how to calculate (10)  
cyclomatic complexity using graph metrics.

Q5 (b) Explain Mutation Testing in detail (10)

**Q6 Write a short note on any four. (20)**

- (a) ISO 9000:2000
- (b) Inspection
- (c) Classification of software matrices
- (d) Integration Testing
- (e) Validation in Software Testing

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