(2½ Hours) [Total Marks: 75]

N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

1. **Attempt *any three* of the following:** 15
a. What is the difference between data, information and knowledge?
b. Draw and explain architecture of business intelligence.
c. Describe different phases in the development of a decision support system (DSS).
d. Describe the extended architecture of decision support systems.
e. Explain structured, unstructured and semi-structured decisions.
f. What are the factors that affect rational choice of the decision-making?

2. **Attempt *any three* of the following:** 15
a. What is a model? Describe the phases in a development of the mathematical model for decision making.
b. Explain predictive and optimization models.
c. Describe categorical and numerical attributes with example for each one of them.
d. Describe different transformation techniques for standardization (normalization).
e. Write short note on principal component analysis (PCA).
f. List and explain various applications of data mining.

3. **Attempt *any three* of the following:** 15
a. Write short note on confusion matrix.
b. What is classification? Write a short note on Bayesian Method of classification.
c. Write a short note on logistic regression used for prediction.
d. Write k-means algorithm for clustering.
e. Draw and explain a structure of classification tree with a suitable example.
f. Explain agglomerative hierarchical clustering method.

4. **Attempt *any three* of the following:** 15
a. Explain a lifetime of a customer in a cycle of relational marketing.
b. What do you understand by market-basket analysis?
c. What is supply chain management? Give an example of global supply chain.
d. List and explain basic principles of revenue management?
e. Explain data envelopment analysis (DEA)? How efficiency is measured?
f. Write short note on CCR (Charnes-Cooper-Rhodes) model.

5. **Attempt *any three* of the following:** 15
a. What are the differences between the process approach and the practice approach in a knowledge management system (KM)?
b. How does Information Technology(IT) contribute to the management of knowledge?
c. Describe different phases in the Knowledge Management Systems (KMS) cycle
d. Who is chief knowledge officer (CKO)? What are the responsibilities of the CKO?
e. Differentiate between conventional system and expert systems
f. What is expert system? How it is different from Decision Support System (DSS)?

(2½ Hours)

[Total Marks: 75]

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(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: 15

a. What is hacker? What are the different types of hackers?
b. Write a short note on arrest but no punishment.
c. Explain Non-cognizable offense.
d. Explain cyber-Pornography.
e. Why there is necessity of arrest without warrant from any place, public or otherwise?
f. What is cybercrime? How the classification of cybercrime is done?

2. Explain *any three* of the following: 15

a. The elements of E-contract.
b. The jurisdiction disputes w.r.t the intent in the United State of America.
c. Shrink and wrap contracts.
d. The Jurisdiction and The Information Technology Act, 2000.
e. The validity of the present law of Jurisdiction.
f. The exclusion clauses in contracts.

3. Attempt *any three* of the following: 15

a. Explain the legislative and other innovative moves against Cyber Squatting.
b. Write a short note on license of copyright.
c. Explain meta tagging.
d. Explain linking.
e. Explain computer software piracy.
f. Explain Framing.

4. Attempt *any three* of the following: 15

a. Explain commencement of operation by licensed certifying authorities.
b. Explain the recognition of foreign certifying authorities.
c. Explain certifying authorities and their liability in the event of digital signature compromise.
d. Write a short note on The United Nations Model Tax Treaty.
e. Write a short note on the Impact of the Internet on Customer duties?
f. Explain Taxation Policies in India.

5. Attempt *any three* of the following: 15

a. What are the different types of Evidences?
b. Explain proving Digital Signature.
c. Explain the other amendments in the Indian Evidence Act by the IT Act.
d. What are the objectives of Consumer Protection Act?
e. What is Complaint? Who can file a Complaint?
f. Explain the District forum.

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B.Sc IT Exam Sem-VI May-2023 18/05/202

Paper / Subject Code: 88705 / Enterprise Networking

(2½ Hours) **[Total Marks: 75]**

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Explain E-Commerce and Internet Connectivity Module
b. Write short note on Network Checklist
c. Write short note on Data Center and Virtualization
d. Explain hierarchical network models and state advantages of it.
e. Explain Load Balancing.
f. List and explain Project Deliverables.

2. Attempt *any three* of the following: **15**

a. What is edge distribution? What are the security measures provided by edge distribution against threats?
b. Explain Data center cooling.
c. Explain steps of STP switch ports
d. Explain the devices used in LAN designs
e. Write a short note on SDN.
f. Explain Gigabit ethernet types.

3. Attempt *any three* of the following: **15**

a. Explain WLC components and types of WLC interface.
b. Write a short note on ISDN.
c. Explain different types of Queuing Methods.
d. Explain Full mesh topology, Partial Mesh topology and Point to point topology
e. Explain DMZ Connectivity.
f. What do you mean by redundancy? Explain N+1 WLC redundancy, N+N WLC redundancy, N+N+1 WLC redundancy.

4. Attempt *any three* of the following: **15**

a. Write a short note on IPV6 Neighbour Discovery Protocol
b. Write a short note on Route Summarization.
c. Define following BGP attributes: i)Next-Hop Attribute ii)Local Preference Attribute iii) Origin Attribute iv)Weight v)MED Attribute
d. Define internet Protocol version 4(IPv4). Explain Ipv4 Header
e. Explain OSPF LSA Types.
f. What is DNS? Explain process of DNS name resolution.

5. Attempt *any three* of the following: **15**

a. Write short note on SNMP protocol.
b. Write a short note on Risk Assessment.
c. What are different methods to check and authorize identity credentials?
d. Explain different types of attacks that can impact the security of IT systems?
e. Explain Encryption Keys in detail.
f. Explain the guidelines for firewall.

(2½ Hours) [Total Marks: 75

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(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: 15

a. Write a short note on GIScience, GISystem and GIS application.
b. What is a Spatial Data and Spatial Analysis? Explain using suitable example.
c. Define Model. Explain how models help in representing real world in GIS.
d. Represent the given three valued raster using quad tree.
F- Forest Land
I-Industrial Area
R- Residential Area

I	I	I	I	R	R	I	F
I	I	I	I	R	R	F	I
F	F	I	I	R	R	R	R
F	F	F	F	R	R	R	R
F	F	F	F	F	F	I	I
F	F	F	F	F	F	F	F
F	F	F	F	R	R	R	R
F	F	F	F	R	R	R	R

e. Explain the mathematical properties of geometric space used in spatial data using suitable diagram.
f. Define spatiotemporal data model. Explain the concept of representing time in GIS.

2. Attempt *any three* of the following: 15

a. Define GIS. Explain its range of capabilities to handle georeferenced data.
b. Explain the GIS Architecture and functionality using suitable diagram.
c. Differentiate between Vector and Raster data representation.
d. What are the reasons for using DBMS in GIS? Explain any five
e. Write a short note on the Relational Data Model
f. Explain the process of linking GIS and DBMS.

3. Attempt *any three* of the following: 15

a. Explain the reference surface for mapping the Earth's surface.
b. Explain the 2D geographic coordinate system.
c. How Map projections are classified? Explain.
d. Explain the working of GPS.
e. Write a short note on vectorization.
f. What is Interpolation? Explain interpolation of continuous Data.

[*Contd...*

4. **Attempt *any three* of the following:** 15

a What are Neighborhood functions in GIS? Explain any four.

b Write a short note on vector overlay operation.

c Explain the two main techniques of determining Automatic classification.

d Perform the raster overlay operation to project Ground Water Level Raster in 2025
R2 = con(R1 > 5 , **R1 - 5** , 0)

R1 – Ground Water Level Raster in 2023

7	8	5	4	3	3
6	4	12	5	4	4
7	10	12	8	7	4
4	8	9	8	7	4
1	1	0	3	0	0
1	0	0	7	0	0

e Write a short note on Network Analysis.

f How Error Propagates in GIS? Explain using suitable diagram.

5. **Attempt *any three* of the following:** 15

a. Explain using suitable diagram the Visualization strategy.

b. Define the following terms:
   i. Symbology
   ii. Cartography
   iii. Map Legend
   iv. Pixel
   v. Voxel

c. Explain the statement "How do I say what to whom, and is it effective?" with reference to map in GIS.

d. List and explain Bertin's six categories of Visual Variables.

e. How to map time series? Explain using suitable example.

f. Write a short note on map dissemination.

(Time: 2½ hours)

Total Marks: 75

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(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Explain in brief about business processes.
b. Write a short note on processes and functions across service lifecycle of ITSM.
c. Explain type I and type III service providers in detail.
d. Explain four P's of Service Strategy with a neat labelled diagram.
e. How are markets defined in service strategy? Explain.
f. What is risk? Explain the phases and different types of risk in detail.

2. Attempt *any three* of the following: **15**

a. Write a short note on balanced service design.
b. What is service design model? List and explain different aspects required during its assessments.
c. Explain any six components of service availability management process.
d. Explain service level management process in detail.
e. Explain in detail supplier management process of service design.
f. What are the challenges associated for achieving successful service design process? Explain in brief.

3. Attempt *any three* of the following: **15**

a. Describe service transition. Explain its objectives, purpose and goal.
b. How to align service transition plans with the business needs? Explain.
c. What is Change? What are the different types of Changes? List and explain Seven R (7 R's) of ITIL Change management.
d. Explain in detail service validation and testing process.
e. Explain the factors affecting the approach to service transition.
f. Write a detail short note on critical success factors of service transition phase

4. Attempt *any three* of the following: **15**

a. Define service operation. Explain the principles of service operation stage.
b. State reasons why service operation staff should be involved at service design and transition stage?
c. What are different types of meetings conducted in organization as mode of communication? Explain.
d. Write short note on Incident Management Lifecycle activities.
e. Explain in detail access management process.
f. List and explain the challenges and risks in service operation phase.

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5. Attempt *any three* of the following: **15**

a. Explain benchmarking in CSI with respect to its procedure, cost and value to the organization.
b. Explain the RACI model.
c. With a neat labeled diagram explain seven steps improvement process of CSI.
d. Write short note on CSI inputs and outputs for the various stages.
e. Explain the tools used to support CSI activities.
f. What are the factors to be considered when preparing a communication plan? Explain.

(2½ Hours)

[Total Marks: 75]

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(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

1. **Attempt *any three* of the following:** 15
a. Explain the principles of TQM in detail.
b. What do you mean by quality? Explain customer's view on quality.
c. Write a short note on continual improvement cycle.
d. What are the constraints of product quality assessment?
e. Explain relationship between quality and productivity.
f. Explain quality assurance elements in detail.

2. **Attempt *any three* of the following:** 15
a. What is a defect? What are the categories of defects?
b. Explain the basic principles on which the testing is based.
c. Write a short note on mutation testing.
d. Explain the process of developing by test methodology.
e. Explain types of prototyping software development model in detail.
f. What are the challenges faced by tester?

3. **Attempt *any three* of the following:** 15
a. What do you mean by random testing? Explain its advantages and disadvantages in detail.
b. Explain equivalence class testing concept with example and its types.
c. What do you mean by decision table? Explain with examples.
d. What is path testing? What are the features of path testing?
e. Write a short note on slice based testing.
f. What do you mean by define/use testing? Explain du and dc path.

4. **Attempt *any three* of the following:** 15
a What are the different entities involved in verification?
b Explain the concept of validation workbench in detail.
c Explain testing during requirement stage.
d Explain the V model for software.
e What are the critical roles and responsibilities in verification and validation?
f Explain types of reviews on the basis of stage/phase during development life cycle.

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5. **Attempt *any three* of the following:** 15

a. Explain the different stages in requirement based testing.

b. Describe code review and unit testing process.

c. Write short notes on stress testing and recovery testing.

d. Explain the concept of critical path analysis (CPA) in detail.

e. Why do software organizations use commercially of the shelf software (COTS)? Explain COTS features in detail.

f. What is regression testing? Explain its importance in detail.

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(2½ Hours)

[Total Marks: 75]

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(6) Use of **Non-programmable** calculators is **allowed**.

1. **Attempt *any three* of the following:** 15

a. Explain 3D's (Defense, Detection, and Deterrence) aspects of security can be applied to any situation.

b. Explain various Application-layer attacks which include any exploit directed at the applications running on top of the OSI protocol stack.

c. Write a short note on CIA Triad Model with reference to Security in Computing.

d. With the help of diagram, explain how Onion Defence Model is better than other Model for security.

e. What is meant by Zone of Trust? Explain the importance of Zone of Trust for communication through with diagram.

f. What are the various countermeasures that, anyone can implement to minimize the risk of a successful attack?

2. **Attempt *any three* of the following:** 15

a. Explain different types of Authentication in detail.

b. How Kerberos Authentication Process takes place? Explain each step with diagram.

c. Write a short note on Certificate-Based Authentication.

d. What is meant by Extensible Authentication Protocol (EAP)? Explain its different types.

e. Explain role of PKI (Public Key Infrastructure) in Security in Computing and Structure and Function of PKI.

f. "Each layer of security is designed for a specific purpose and can be used to provide authorization rules". Explain this statement with reference to Database Security Layers and its types.

3. **Attempt *any three* of the following:** 15

a. Explain different layers of two-tier network fundamentals.

b. With reference to OSI model in which layer does Router operate? Explain the working of Routing Protocols.

c. Write a short note on different generation of Firewalls.

d. Explain role of ICMP, SNMP and ECHO in network hardening.

e. With the help of diagram, explain working of Bluetooth Protocol Stack.

f. What is meant by Wireless Intrusion Detection and Prevention? Explain working of it.

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4.	**Attempt *any three* of the following:**	15
a	Write a short note on two types of IDS Generation in brief.	
b	What is Private Branch Exchange (PBX)? Explain how it can be secured	
c	How Mandatory Access Control Lists (MACL) differ from Discretionary access control lists (DACLs)? Explain.	
d	Explain working of Biba and Clark Wilson Classic Security Models.	
e	What is meant by Security Reference Monitor? Explain Windows Security Reference Monitor in detail.	
f	Explain main problems of TCP/IP's lack of security.	

5.	**Attempt *any three* of the following:**	15
a.	What is meant by Hypervisor machine? Explain Why it is necessary to protect this machine.	
b.	Write a short note on Security Benefits of Cloud Computing.	
c.	With the help of diagram explain the concept of Secure development lifecycle in Agile.	
d.	Explain phishing mechanism and 3D's aspects of security with reference to it.	
e.	Give a reason in brief, why it is mandatory to update application patches? Explain various mechanisms for easily updating applications.	
f.	Explain various concerns for web application security to be considered with reference to Security in Computing.	

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