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BCA Vth Semester Examination, 2025

COMPUTER NETWORK

Paper : NBCA-501

Time : 2 Hours]

[M.M. : 70

Note :- Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A

[10×1=10]

Note :- Attempt any *one* question.

1. Explain the services of each layer of ISO/OSI model in detail with suitable diagram.

Or

2. Define Topology and their types with appropriate example.

Section-B

[20×3=60]

Note :- Attempt any *three* questions.

3. (a) Explain modes of transmission with proper example.
- (b) Explain ISDN (Internet Services Digital Network) and the types of services provided by ISDN.
4. (a) Explain communication medium with appropriate example.
- (b) Discuss Channel Allocation in Medium Access Control (MAC) layer. Explain all the cases of Stop and Wait ARQ with appropriate diagram.

5. (a) Explain IP addressing, the classification of addressing and ranges with suitable diagram. Define subnetting and default subnet mask for each class.
- (b) Explain Leaky Bucket and Token Bucket Congestion Control techniques in detail.
6. (a) Explain various traffic shaping algorithms.
- (b) Differentiate TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) with proper explanation also discuss segmentation and reassembly service of transport layer in detail.
7. (a) Discuss e-Mail architecture with its components.
- (b) Define network security and discuss various network security services in computer network.
8. (a) Discuss Network Virtual Terminal with example.
- (b) Differentiate classful and classless IP addresses.

9. (a) Explain IPV4 datagram with proper explanations of all the fields.
- (b) Differentiate subnetting and super-netting with example.
10. (a) Explain Domain Name System architecture.
- (b) Differentiate SMTP protocol and FTP protocol in application layer.

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BCA Vth Semester Examination, 2025

DATA ANALYTICS

Paper : NBCA-502

Time : 2 Hours]

[M.M. : 70

Note :- Attempt Four questions in all. One question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining three questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A

[10×1=10]

Note :- Attempt any one question.

1. Explain in detail the sources and nature of data used in analytics. Discuss the difference between structured, semi-structured, and unstructured data with real-world examples.

Or

- (a) 2. List the types of data analysis, explain how each type supports data-driven decision making in organizations with example.
- b)

Section-B

[20×3=60]

Note :- Attempt any *three* questions.

3. What is data profiling ? Explain the steps and significance of data exploration in analytics. How does target data analysis help in model development ?
4. Differentiate between continuous and discrete probability distributions. Explain Normal Distribution, sample mean, population mean, bias, and variance with examples.
5. Explain hypothesis testing in detail. Describe all steps from hypothesis formulation to conclusion and illustrate using a business analytics example.

6. What is Regression Analysis ? Explain the differences between simple and multiple regression. Discuss how ANOVA supports regression model evaluation.
7. Define data streams. Explain the architecture of a stream data model and describe how sampling and filtering techniques are applied for stream data analytics.
8. What is Data Cleaning ? Discuss the causes and impacts of missing values and outliers. Explain different imputation and outlier-handling techniques with examples.
9. Define Data Visualization and explain its importance in analytics. Discuss how visual storytelling enhances understanding and communication of analytical results.
10. Explain the advantages and limitations of different chart types such as line, bar, pie, histogram, box plot, and heat map. Provide examples where each type of visualization is best suited.

4022**BCA Vth Semester Examination, 2025****ARTIFICIAL INTELLIGENCE****Paper : NBCA-503***Time : 2 Hours]**[M.M. : 70*

Note :- Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A**[10×1=10]**

Note :- Attempt any *one* question.

1. What do you mean by Artificial intelligence ? Discuss AI applications with suitable example in context of natural language processing, Computer Vision, Robotics and Expert System.

Or

2. What do you mean by Intelligent Agent ? Discuss its types. Draw the structure, key features and working principle of learning based agents. Also write its advantage and disadvantage.

Section-B

[20×3=60]

Note :- Attempt any three questions.

3. What is meant by searching for solutions in Artificial Intelligence ? Differentiate between uninformed search and informed search strategies. Explain the working of Breadth-First Search with a suitable example, and discuss how it differs from Depth-First Search in terms of strategy, efficiency, and completeness.
4. Explain the working of algorithms such as Hill Climbing, best first search, and branch and bound also compare their advantages and limitations in solving complex optimization problems.

5. Discuss the role of First Order Predicate Logic, unification, forward and backward chaining in knowledge-based reasoning systems. Illustrate with suitable examples how these techniques help in automated inference and decision-making.
6. What is a Rule-Based System in Artificial Intelligence ? Explain its structure and working principle. Discuss how knowledge is represented using production rules and describe the role of the inference engine in deriving conclusions with suitable examples.
7. Discuss how exceptions and default frames are handled within semantic networks to represent real-world knowledge. Illustrate your answer with suitable examples showing inheritance and exception handling in a semantic hierarchy.
8. What is an Expert System ? Discuss the need and justification for developing expert systems in Artificial Intelligence. Explain the process of knowledge acquisition and describe the main components of an expert system with suitable examples.

9. Explain the concepts of non-monotonic reasoning and probabilistic reasoning in Artificial Intelligence. Discuss how certainty factors and fuzzy logic are used to handle uncertainty and approximate reasoning in knowledge-based systems. Illustrate your answer with suitable examples.
10. Explain the concept of learning in Artificial Intelligence. Discuss the role of learning automata and learning by induction in machine learning systems. Describe how neural networks support learning from data, highlighting their structure and working with suitable examples.

Sungam

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BCA Vth Semester Examination, 2025
SOFTWARE TESTING AND AUDIT
Paper : NBCA-5052

Time : 2 Hours]

[M.M. : 70

Note :- Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A

[10×1=10]

Note :- Attempt any *one* question.

1. Explain Software Testing Life Cycle. Also differentiate between verification and validation.

Or

2. Discuss the role of SRS in software testing and project management. What is SRS Verification ?

Section-B

[20×3=60]

Note :- Attempt any three questions.

3. Explain boundary value analysis and equivalence class testing in detail.
4. Explain cyclomatic complexity in detail. Discuss its purposes, methods of calculation, advantages and limitations with an example.
5. What are Test Cases ? Explain regression test cases selection and code coverage prioritization technique in detail.
6. Describe in detail various measures for reducing number of test cases.

7. Explain various levels of testing along with few testing techniques and their applicability. Also, discuss exploratory testing.
8. Define Test Data. Explain test data generation using genetic algorithm.
9. Explain Object Oriented Testing and various issues associated with it. Also, compare object oriented integration and system testing.
10. Explain class level testing in object oriented systems. Also, explain usability testing and post deployment testing in context of testing web applications.

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BCA Vth Semester Examination, 2025

UNIX OPERATING SYSTEM

Paper : NBCA-5053

Time : 2 Hours]

[M.M. : 70

Note :- Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A

[10×1=10]

Note :- Attempt any *one* question.

1. Differentiate between UNIX and LINUX historically and technically. Discuss how LINUX evolved from UNIX. [10]

Or

2. Discuss the features of UNIX operating system and the concept of parent-child relationship in the UNIX file system. [10]

Section-B

[20×3=60]

Note :- Attempt any *three* questions.

3. Explain the working of the command-line interface (CLI) in UNIX-like systems. How are user commands interpreted and executed ? [20]
4. Explain the structure of UNIX architecture with a neat diagram. Also discuss internal and external commands. Give examples and explain how UNIX identifies them. [20]
5. Explain how file permissions are represented in UNIX. How can they be modified using `chmod` ? Also describe the mechanism of background process execution using examples. [20]

6. Write a detailed explanation of process creation in UNIX, including **fork()**, **exec()**, and **wait()** system calls. Also explain zombie processes. How are they created and handled by the system ? [20]
7. Discuss the significance of the **uniq** and **sort** commands in UNIX data processing. Additionally, explain how the **head**, **tail**, and **pr** commands are used for file handling with suitable examples. [20]
8. Explain the concept of filters in UNIX. Discuss the working and combined usage of **cut**, **paste**, and **sort** with suitable examples. [20]
9. Explain the shell interpretive cycle in UNIX. What are shell variables ? How do they differ from environment variables ? [20]

10. Discuss in detail the concept of pattern matching in UNIX shells. Include the use of wildcards and metacharacters. Also explain the complete process of input/output redirection and piping. How do these enhance shell usability ? [20]

4027**BCA Vth Semester Examination, 2025****DATA MINING AND DATA
WAREHOUSING****Paper : NBCA-5054***Time : 2 Hours]**[M.M. : 70*

Note :- Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A**[10×1=10]**

Note :- Attempt any *one* question.

1. Define data mining and explain its main functionalities.
Discuss real-life applications of data mining.

Or

- 10.
2. What is data pre-processing ? Explain how missing and noisy data are handled in pre-processing.

Section-B

[20×3=60]

Note :- Attempt any three questions.

3. Describe concept description and analytical characterization in data mining. How are statistical measures applied ?
4. Discuss association rule mining, and illustrate with an example from transactional databases.
5. Explain the classification process using decision trees and the k-nearest neighbour classifier.
6. What are the challenges of prediction in data mining ? Discuss the Bayesian classification method.
7. Compare partitioning and hierarchical clustering methods. Explain CURE and Chameleon algorithms.

8. Describe density-based and grid-based clustering (DBSCAN, OPTICS, STING, CLIQUE) methods with examples.
9. Explain the architecture of a data warehouse. How does it differ from a database system ? Describe 3-tier architecture and the role of data marts.
10. Illustrate the star, snowflake, and fact constellation schema. Describe the concept hierarchy and its relevance in the multi-dimensional model.

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BCA VIth Semester Examination, 2026

(Old Course)

**CYBER LAW AND INTERNET
SECURITY**

Paper : BCA-602

Time : 2 Hours]

[M.M. : 70

Note :- Attempt *Four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A

[10×1=10]

Note :- Attempt any *one* question.

1. Explain security issues in hardware and data storage devices.

Or

2. Discuss digital signatures and their legal recognition in India.

Section-B

[20×3=60]

Note :- Attempt any *three* questions.

3. What are traditional and extra-territorial jurisdiction ?
Also explain cyber space jurisdiction.
4. Explain issues in E-commerce in India and describe what is E-governance.
5. Explain in detail the concept of IPR in the internet era including cybersquatting and trademark disputes.
6. Discuss concept of trademarks in internet era. Also explain copyright in digital medium and computer programs.
7. Discuss information security governance and risk management.

8. Write a short note on CCTV and physical security of IT assets.
9. Discuss the development and implementation of security policies in organizations.
10. What are WWW policies and e-mail security policy ?
Also discuss publishing and notification requirement of policies.

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B.C.A. VIth Semester Examination, 2025

**CYBER LAW AND INTERNET
SECURITY**

Paper : BCA-602

Time : 2 Hours]

[M.M. : 70

Note :- Attempt *four* questions in all. *One* question out of two questions (10 marks each) is to be attempted from Section 'A'. Remaining *three* questions (each carrying 20 marks) are to be attempted out of eight questions given in Section 'B'.

Section-A

[10×1=10]

Note :- Attempt any *one* question.

1. What are the traditional principles of Jurisdictions ?
Explain Jurisdiction issues under IT Act, 2000.

Or

2. Describe electronic signature in Indian Law. Explain E-commerce issues in Indian Law.

Section-B

[20×3=60]

Note :- Attempt any *three* questions.

3. Explain jurisdictions in Trademark Disputes. Differentiate Cyber-squatting and Reverse Hijacking. Furthermore, illustrate issues and provisions in Indian Law.
4. Discuss the concept and principle of Trademark in Internet Era. Differentiate copyright in digital medium and copyright in computer programs.
5. What is Risk Management ? Discuss the different features of security architecture. Furthermore, define CCTV with its features in detail.

6. Describe Data Storage and Access Control in system.
Explain backup security measures.
7. Discuss the term physical security of IT Assets. What is the way to achieve physical security of IT assets ?
Discuss intrusion detection systems in detail.
8. Explain the term copyright with its benefits.
Differentiate copyright in digital medium and copyright in computer programs.
9. What do you mean by Development of Policies ? What are the WWW Policies ? Discuss the features and drawbacks of policies development.
10. Describe Security Policies. Explain publishing and notification requirement of the different security policies.