2025

Full Marks : 70

Time : 3 hours

Answer from **both** the Sections as directed.

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

SECTION—A

Answer any *four* questions : 10×4

1. State Operation Research and explain its scope.

2. Explain the guideline on linear programming model formula with an example.

3. Solve the linear programming problem graphically

Max. $Z = 5x_1 + 3x_2$

s.t $3x_1 + 5x_2 \leq 15$

$5x_1 + 2x_2 \leq 10$

$x_1, x_2 \geq 0$

4. Solve the linear programming problem graphically :

Min. $Z = 3x_1 + 5x_2$

s.t $x_1 + 3x_2 \geq 3$

$x_1 + x_2 \geq 2$

$x_1, x_2 \geq 0$

5. Using, simplex method to solve the linear programming problem :

Max. $Z = 7x_1 + 5x_2$

s.t $x_1 + 2x_2 \leq 6$

$4x_1 + 3x_2 \leq 12$

$x_1, x_2 \geq 0$

6. Determine, basic feasible solution by Vogal's method

	W_1	W_2	W_3	Supply
F_1	2	7	4	5
F_2	3	3	1	8
F_3	5	4	7	7
F_4	1	6	2	14
Demand	7	9	18	

7. Find the optimal assignment for the assignment problem with the following cost matrix :

Machines

		I	II	III	IV
Jobs	A	5	3	1	8
	B	7	9	2	6
	C	6	4	5	7
	D	5	7	7	6

8. A project schedule has the following characteristics :

Activity	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-10	9-10
Time (day)	4	1	1	1	6	5	4	8	1	2	5	7

(i)   Construct Network diagram

(ii)   Compute the earliest event time and latest event time

(iii)   Determine the critical path and total project duration

SECTION—B

Answer *all* the questions.   3 × 10

9. What is linear programming problem ?

10. Write Degenerate and non-degenerate basic feasible solution.

11. Define an assignment model for *m*-machines and *n* jobs.

12. Write the name of four methods to find the basic feasible solution of a transportation problem.

13. Define the slack and surplus variable in linear programming problem.

14. Write about PERT.

15. Discuss the role of computers in operation research.

16. Write down the general form of objective function in LPP.

17. How Assignment problem is different from Transportation problem ?

18. What is Basic feasible solution ?

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SECTION—A

Answer any *four* questions :   10 × 4

1. Define Management and its importance.

2. Discuss the principles of Management.

3. Discuss the Social Responsibility of Business.

4. Define Planning and its objectives.

5. Define Staffing and its importance.

6. Define communication and barriers of communication.

7. Define Leadership and qualities of a good leader.

8. Define Coordination and its importance.

SECTION—B

All questions are compulsory.   3 × 10

9. Define the different levels of Management.

10. Define Business Ethics.

11. Define Organising.

12. Define Delegation of authority.

13. Define Direction.

14. Define Motivation and its types.

15. What is Decentralization ?

16. Define Controlling.

17. Discuss the importance of Planning.

18. Define Administration.

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2025

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GROUP—A

Answer any *four* questions: 10 × 4

1. Explain the hierarchical (tree-like) structure of the Linux file system. Why is this beneficial ?

2. Define Shell. What are different types of shells available in Linux ? Explain.

3. Explain different editors in Linux. Discuss **vi** editor in detail with functional keys.

4. What is a "filter" in the context of Linux command-line utilities ? Give three examples of common filter commands. Write a **grep** command to display the lines which does not matches all the given pattern.

5. Explain the difference between while and until loop in linux ? Write a shell script to print first 10 natural number in reverse order.

6. What are metacharacters in the context of the shell ? Give examples of at least three different metacharacters and explain their typical function.

7. What is the primary role and responsibility of a Linux System Administrator ?

8. Explain the following commands with an example.

   (a) kill

   (b) touch

   (c) chmod

   (d) gzip

GROUP—B

Answer *all* the questions: 3×10

9. What is Inode number ?

10. What is sed primarily used for ?

11. What is the root directory and what is its symbol ?

12. Explain the difference between **df** and **du**. When would you use each ?

13. What are some common options for the 1s command and what do they do ?

14. What is a system call ?

15. Describe about I/O Redirection operations.

16. What is Pipping in Linux ?

17. Differentiate between **head** and **tail** command in Linux.

18. What does the we command do ? How would you count the number of lines, words, and characters in document.txt ?

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2025

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GROUP–A

Answer any *four* questions: 10 × 4

1. What is Network Security ? Identify and explain the three fundamental security goals or principles.

2. What do you mean by cryptography ? Define the fundamental components of a basic encryption process.

(2)

3. Explain the fundamental concept of Public Key Encryption. Explain RSA algorithm with suitable example.

4. What is a Digital Signature ? Briefly explain the concept of the "Trust Problem" in digital communication. How does a Digital Signature provide "non-repudiation" ?

5. What is Transport Layer Security ? Describe the key phases of a typical TLS handshake process.

6. What is Kerberos ? Explain how it provides secure authentication in a distributed network.

7. What are the types of Firewall ? Explain each of them in detail.

8. What is Computer Virus ? How Viruses Spread ? How can you protect against viruses ?

(3)

GROUP–B

Answer *all* the questions. 3 × 10

9. What is Cryptanalysis ?

10. What is Ransomware ?

11. Define steganography.

12. Differentiate between stream cipher and block cipher.

13. Differentiate between Active and Passive attack.

14. Define Secure Electronic Transaction (SET) protocol.

15. What is Intrusion Detection System (IDS)?

16. What is non-repudiation ?

17. Define X.509.

18. What is IP Spoofing ?

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GROUP–A

Answer any *four* questions.   10 × 4

1. Define MIS. Discuss the important objectives of MIS. Also, list the important characteristics of MIS.

2. Discuss the various approaches and criteria used to evaluate the effectiveness and efficiency of Management Information System (MIS) within an organization.

3. Discuss in detail the pitfalls of using MIS in an organization.

4. Explain the role of IT for gaining competitive advantage for a business organization.

5. What is data and information ? List the important characteristics of information. With the help of suitable example prove that "every information is a processed data but the reverse is not true". Accuracy, Relevance, completeness, timeliness, clarity.

6. Explain the key stages involved in the implementation of a Management Information System (MIS) within an organization. Discuss the challenges faced during implementation.

7. What are different levels of management? Also, explain various decision characteristics.

8. Define DSS. Differentiate between active, passive, and cooperative DSS.

GROUP–B

Answer *all* questions.   3 × 10

9. What is executive information system ?

10. Which information system is useful for middle level management ? Why ?

11. Define ESS.

12. Define zero-based decision making.

13. What are the personal biases in decision making ?

14. List the functions usually performed by managers.

15. Justify the statement with example "there is no right and wrong decision for an organization, it should be rational decision." Comment.

16. 'Managers are looking for information and not data" Justify the statement with examples.

17. What are the recent developments in the field of information technology in India ?

18. How does information system help in Strategic planning ?

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