

2024

*Full Marks : 70*

*Time : 3 hours*

Answer from **both** the Groups 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.*

GROUP—A

Answer any *four* questions:  $10 \times 4$

1. Define Operation Research and discuss its scope.
2. Explain General mathematical model of linear programming problem.
3. Solve the linear programming problem graphically:

( 2 )

$$\text{Max. } z = 3x_1 + 5x_2$$

$$\text{S.t. } x_1 + 2x_2 \leq 20$$

$$x_1 + x_2 \leq 15$$

$$x_2 \leq 8$$

$$x_1, x_2 \geq 0$$

4. Solve the linear programming problem graphically:

$$\text{Min. } z = 2x_1 - x_2$$

$$\text{S.t. } x_1 + x_2 \leq 5$$

$$x_1 + 2x_2 \leq 8$$

$$x_1 \geq 0, x_2 \geq 0$$

5. Using Simplex method to solve the linear programming problem.

$$\text{Max. } z = x_1 + 2x_2 + 3x_3$$

$$\text{S.t. } 4x_1 + 2x_2 + x_3 \leq 4$$

$$x_1 + 2x_2 + 3x_3 \geq 8$$

$$x_1, x_2, x_3 \geq 0$$

( 3 )

6. Determine the initial basic feasible solution to the following transportation problem using North-West Corner method.

	$W_1$	$W_2$	$W_3$	$W_4$	$W_5$	Supply
$F_1$	3	4	6	8	9	20
$F_2$	2	10	1	5	8	30
$F_3$	7	11	20	40	3	15
$F_4$	2	1	9	14	16	13
Demand	40	6	8	18	6	

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

	Machine			
	A	B	C	D
1	2	3	4	5
2	4	5	6	7
3	7	8	9	8
4	3	5	8	4

( 4 )

8. For a Certain activity the total float is 12 weeks and the head event slack in 3 weeks compute the free float for this activity.

GROUP—B

Answer *all* the questions:  $3 \times 10$

9. Define linear programming problem.
10. What are the dummy row and dummy column in assignment problem ?
11. Define Optimal solution and Basic feasible solution.
12. What are the limitations of Operation Research ?
13. Name the four methods to find the Basic feasible solution of a transportation problem.
14. How CPM differs from PERT ?

( 5 )

15. Plot the graph for:

$$\begin{aligned}x - 2y &\leq 1 \\x + 2y &\geq 3 \\x, y &\geq 1\end{aligned}$$

16. Define Float and give its types.
17. Define assignment model.
18. Define Non-degenerate basic feasible solution.

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**SECTION-A**

**Answer any *four* questions: 10 × 4**

- 1. Define file system. Explain the file system tree architecture of Linux OS.**
- 2. Define Linux OS. Describe the features of Linux.**
- 3. Who is system administrator ? Explain the role of system administrator in linux OS with commands.**

*( Turn Over )*

4. What are shells ? Write a shell program to count the number of lines in a given file.

5. What are various editors available in Linux ? Explain any one with its features and modes.

6. Define loop. Describe while loop and until loop with the suitable example.

7. (a) Compare and contrast pipes and redirections.

(b) Write short notes on wildcard character.

8. Explore the following commands with example.

(a) rm

(b) awk

(c) grep

(d) Kill

(e) Sed

SECTION-B

All questions are compulsory: 3 × 10

9. What is Kernel ?

10. What is bash ?

11. Write the advantages of open source.

12. How do you change file permissions in Linux ?

13. What are filters ?

14. What is GRUB ?

15. Name the command to see the disk free space.

16. Write a shell script to calculate the simple interest.

17. Describe IF Statement with example.

18. Define environment variable.

**UG-C-6002-BCA**

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**GROUP—A**

Answer any *four* questions:  $10 \times 4$

1. Define Planning and its features.
2. Describe any five Fayol's principle of management.
3. Define Management and its functions.
4. Describe the importance of management.
5. Define Decentralisation and its advantages.

( Turn Over )

( 2 )

6. What is communication ? Describe it's process.
7. Distinguish between Formal and Informal Organisation.
8. Define coordination and describe it's importance.

GROUP—B

Answer *all* the questions: 3 × 10

9. Describe any three characteristics of Motivation.
10. Explain three features of Planning.
11. Explain any three types of Leadership Styles.
12. Define Staffing.
13. Define Directing.
14. Describe the levels of Management.

( 3 )

15. Explain any three barriers to communication.
16. Explain any three qualities of a good leader.
17. Explain any three barriers to planning.
18. Explain any three steps of organizing.

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GROUP—A

Answer any *four* questions:  $10 \times 4$

1. What do you mean by network security ? Explain the various types of security mechanism used in network security.
2. Define cryptography. State and explain the principles of public key cryptography.
3. Explain RSA algorithm in detail. Perform decryption and encryption using RSA algorithm with  $p = 3$ ,  $q = 11$ ,  $e = 7$  and  $N = 5$ .

( Turn Over )



( 2 )

4. What is digital signature ? What are the properties a digital signature should have? Explain the working of digital signature with a neat diagram.
5. Discuss various authentication functions. Explain the format of the X.509 certificate.
6. Describe about SSL/TLS Protocol. Briefly explain the architecture of SSL.
7. Explain the technical details of firewall and describe any three types of firewall with neat diagram.
8. Define intrusion detection and the different types of detection mechanisms, in detail.

GROUP—B

Answer all questions: 3 × 10

9. List out the features of SET.

( 3 )

10. Differentiate between symmetric key cryptography and asymmetric key cryptography.
11. Define S/MIME.
12. Name three viruses & describe it.
13. What is Zombie ?
14. Specify the requirements for message authentication.
15. Define Kerberos.
16. Compare stream cipher with block cipher.
17. Differentiate between Active and Passive attack.
18. Define Steganography.

**UG-C-6007-BCA**

**2024**

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**GROUP—A**

Answer any *four* questions:  $10 \times 4$

1. Define MIS. Explain structure of MIS. List important advantages of MIS.
2. Information requirements vary at different levels of management in an organisation. Discuss various types of information system that might be useful to managers depending on their roles and responsibility with the help of an example.

( Turn Over )

3. Why are data, information, business intelligence, and knowledge important to Apple? Give an example of each type in relation to the iPhone.

4. "Perhaps the biggest challenge in the effectiveness of MIS in any organisation is Maintenance". Explain with suitable examples.

5. What are the various methods for development of MIS? Discuss them along with their advantages and disadvantages.

6. Explain the concept and meaning of knowledge work. Describe the technology support and its significance in knowledge work.

7. What is decision making in an organization? Describe Simon's decision making model. Identify the important use of Decision Making System.

8. What are the fundamental weakness and pitfalls in Management Information System development?

GROUP—B

Answer all questions: 3 × 10

9. Describe the operating demerits of MIS.

10. How do you evaluate the performance of MIS?

11. Define Transaction Processing System (TPS).

12. Explain Information Support System (ISS).

13. Explain main challenges faced by CRM.

14. How IT and IS may be used to help the company operate and achieve its objective?

15. What is MIS Office automation?

16. What is Supply chain management?