UG-C-6001—BCA

2026

Full Marks : 70

Time : 3 hours

Answer all questions

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 × 4

1. Discuss the characteristics of the Operations Research approach. Explain how Operations Research differs from conventional decision-making techniques.

2. Discuss the structure of a Linear Programming Model. Explain objective function,

decision variables, constraints and non-negativity restrictions with examples.

3. A manufacturer produces two products P1 and P2. Profit on P1 is ₹40 per unit and Profit on P2 is ₹30 per unit. Each unit requires

Resource	P1	P2	Available
Machine Hours	2	1	100
Labor Hours	1	1	80

Formulate the Linear Programming Model and solve it graphically.

4. Describe the Simplex Algorithm for solving Maximization Problems. Explain each step with a suitable example.

5. Solve the following Minimization Problem using the Simplex Method.

(*Continued*)

Minimize $Z = 4x_1 + 3x_2$

Subject to

$2x_1 + x_2 \geq 8$

$x_1 + 2x_2 \geq 6$

$x_1, x_2 \geq 0$

6. A department has four subordinates and four tasks have performed. How should the task be allocated, so as to minimize the total man hours.

	I	II	III	IV
A	8	26	17	11
B	13	28	4	26
C	38	19	18	15
D	19	26	24	10

7. Obtain the Initial Basic Feasible Solution using the Least Cost Method for the following transportation problem.

	D1	D2	D3	Supply
S1	6	8	10	30
S2	7	11	11	40
S3	4	5	12	20
Demand	20	30	40	

8. Explain Project Management. Differentiate between PERT and CPM with suitable examples.

GROUP-B

Answer all questions : 3×10

9. What are the objectives of Operations Research ?

10. List any three applications of Operations Research.

11. Differentiate between feasible solution and optimal solution.

12. Why are slack variables introduced in the Simplex Method ?

13. Differentiate between maximization and minimization problems.

14. What is the North-West Corner Rule ?

15. Write the mathematical model of the Transportation Problem.

16. What is the significance of Critical Path Analysis ?

$$\sum_{i=1}^{n} x_{ij} = 0$$

17. Determine whether the point (2,3) satisfies the following constraints.

$$x + y \leq 6$$

$$2x + y \leq 8$$

18. Identify the slack variable for the constraint $3x + 2y \leq 12$.

Total Pages—3

UG-C-6002—BCA

2026

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 of the following : 10 × 4

1. Define Management. Discuss its function.

2. Describe the different levels of Management and explain their functions.

3. Describe any seven Fayol's principle of management.

4. Define Planning. Also explain its process.

5. Define Communication. Describe its process.

6. Describe the different types of organization.

7. Define Controlling. Discuss the steps involved in the process of controlling.

8. Define Leadership. Also explain the functions of leader.

GROUP–B

9. Answer *all* the questions : 3×10

(a) What is planning ?

(b) What do you know about management skill ?

(c) Explain any three barriers of Effective Planning.

(d) Define Delegation of Authority.

(e) What is coordination ?

(f) Define Directing.

(g) What is meant by Business Ethics ?

(h) Define Leadership.

(i) Explain any four qualities of a good leader.

(j) Briefly explain the importance of controlling.

Total Pages – 4

UG-C-6003—BCA

2026

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 of the following : 10×4

1. Explain the hierarchical (tree-like) structure of the Linux File System. Why is it beneficial ?

2. Define Shell. What are the different types of Shells available in Linux ? Explain with suitable examples.

(*Turn Over*)

3. Explain different editors available in Linux. Discuss the Vi Editor in detail with its modes and commonly used commands.

4. What are Filters in Linux ? Explain any four filter commands with suitable examples. Also differentiate between Redirection and Piping.

5. Explain the while and until loops with suitable examples. Write a shell script to print the first 10 natural numbers.

6. Explain the if-else and case statements with suitable examples.

7. What is the primary role and responsibility of a Linux System Administrator ? Explain the functions performed by a System Administrator.

(*Continued*)

8. Explain the following commands with suitable examples :

(*a*) chmod

(*b*) grep

(*c*) awk

(*d*) gzip

SECTION-B

(Short Answer type Question)

Answer **all** questions : 3 × 10

9. What is an Inode Number ?

10. What is Bash ?

11. What is the Root Directory ? What is its symbol ?

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

13. What is a file system ?

14. What is a System Call ?

15. What is Piping in Linux ?

16. What are Environment Variables ?

17. Differentiate between head and tail commands.

18. Write the Linux command to ;

(*a*) Count the number of lines, words and characters in document.txt.

(*b*) Display the current working directory.

Total Pages—4

UG-C-6004—BCA

2026

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 only **four** of the following questions : 10 × 4

1. Explain the CIA Triad (Confidentiality, Integrity, and Availability). Discuss how each security service protects computer networks against attacks.

2. Compare Symmetric Key Cryptography and Public Key Cryptography. Explain their advantages, disadvantages, and applications.

3. Explain the RSA Public Key Encryption Algorithm with key generation, Perform encryption and decryption using RSA algorithm with p=3,q=11,e=7 and N = 7.

4. Explain the concept of Digital Signature. Describe the Digital Signature Generation and Verification Process with a neat diagram. Discuss its applications.

5. Explain different Malware Threats including Worms, Trojan Horses, and Logic Bombs. Compare them with suitable examples.

6. Explain the Secure Socket Layer (SSL) protocol in detail. Describe SSL architecture, Handshake Protocol, and Session Establishment with neat diagrams.

(*Continued*)

7. Explain the role of the different servers in kerberos protocol.

8. What is firewall ? Explain different types of Firewall.

SECTION–B

All questions are compulsory : 3×10

9. Describe Brute Force Attack.

10. Write difference between Block Cipher and Stream Cipher.

11. Discuss various types of Security Attacks.

12. What is Authentication.

13. Explain Digital Wallet.

14. What is X.509 certificate ? List its importance.

15. What is Intrusion Detection System ?

16. Write difference between IP spoofing and IP phishing.

17. What is Zombie ?

18. What is Steganography ?

UG -E-6007—BCA

2026

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 of the following : 10 × 4

1. Define Management Information System (MIS). Explain its technical and business perspectives with suitable examples.

2. Describe the organizational structure of MIS. Explain the role of MIS within a company.

3. What is decision making ? Explain how MIS supports decision making in an organization.

4. Explain the evolution of Information Systems. Discuss the different types of basic Information Systems.

5. Describe the methodology used in the development of MIS. Explain any four tools or techniques used in MIS development.

6. What is Advanced MIS ? Explain its need and discuss the problems in achieving Advanced MIS.

7. Define Decision Support System (DSS). Explain its features, components and advantages.

(*Continued*)

8. Explain the common pitfalls in MIS development. Discuss the planning and design problems with suitable examples.

SECTION - B

(*Compulsory*)

Answer **all** questions : 3 × 10

9. Explain main challenges faced by CRM.

10. Define Transaction Processing System ?

11. List any three objectives of MIS.

12. What is Executive Information System ?

13. Define Information Support System (ISS).

14. What is meant by Balanced MIS ?

15. Differentiate between Data and Information.

16. List the functions usually performed by managers.

17. What are the main criteria used to evoluate MIS performance ?

18. How does user feedback contribute to MIS modification ?

