Bachelor in Computer Applications
Course Title: Geographical Information System
Code No: CACS454
Semester: VIII

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions.

[6×5 = 30]

2. Define GIS. Describe benefits of GIS. [2+3]
3. Explain elements of map. [5]
4. What is remote sensing? How remote sensing works? [1+4]
5. What is digital terrain model? Describe its application. [1+4]
6. Explain about the functional components of GIS. [5]
7. Describe the characteristics of good database design. [5]
8. Write short notes on (Any Two): [2.5+2.5]

   a) Map layers

   b) Map projection

   c) Geodatabase

Group C

Attempt any TWO questions.

[2×10 = 20]

9. Define raster and vector data. Differentiate between their properties with advantages and disadvantages. [2+8]
10. Explain spatial database design with example. [10]
11. Describe the role of GIS in developing country like Nepal. Support your answer with reference of an application. [10]

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[6×5 = 30]

2. What is Information Security? List and briefly define fundamental security design principles. [1+4]

3. Explain HMAC with its objectives. [5]

4. What are the vulnerabilities of passwords? Explain different strategies used for the selection of effective password. [2+3]

5. Define access right, Explain the concept of trust framework. [1+4]

6. Describe about honeypot with the types of honeypots that may be deployed. [5]

7. How can you say that Intrusion Detection System is the backbone for Information Security? Justify along with its categories. [5]

8. Explain the terms SSL, TSL and handshake protocol. [5]

Group C

Attempt any TWO questions.

[2×10 = 20]

9. Define the terms threats and attacks in terms of Information Security. Explain different types of security threats in detail. [2+8]

10. What is a cryptosystem? Explain the concepts of Vignere and Rail Fence Ciphers in detail. [2+8]

11. What is a security audit? What is its importance? Explain the security auditing architecture in detail. [2+2+6]

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Bachelor in Computer Applications
Course Title: Operational Research
Code No: CAOR453
Semester: VIII

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to answer the questions in their own words as far as possible.

Group B

Attempt any SIX questions.   [6×5 = 30]

2. What is Operational Research? Explain the general methods for solving OR models   [1+4]

3. What do mean by mathematical formulation of LPP? A firm manufactures three products A, B, C. Time to manufacture product A is twice that for B and thrice that for C and to be produced in the ratio 3 : 4 : 5. The relevant data is given in the following Table. If the whole raw material is engaged in manufacturing product A, 1600 units of this product can be produced. There is demand for at least 300, 250, 200 units of products A, B and C and the profit earned per unit is Rs. 50, Rs. 40, Rs. 70, respectively. Formulate the problem as a linear programming problem.

[1+4]

Raw Material	Requirement per unit of product (kg)			Total Availability (kg)
	A	B	C	
P	6	5	9	5000
Q	4	7	8	6000

4. Write an algorithm to maximize the solution of LPP using Simplex method.

5. Find the optimal solution for the following transportation problem using any methods.

1	2	1	4	30
3	3	2	1	50
4	2	5	9	20
20	40	30	9	100

6. Write Hungarian algorithm to solve the assignment problem.

7. Classify the queueing models with example.

8. Write short notes on (Any Two):   [2.5+2.5]
   a) EOQ
   b) Kendall's Notation for Queueing Model
   c) Duality theorem