Tribhuvan University

Faculty of Humanities and Social Science

Semester: VIII

Subject: Operational Research

2017 Batch

Group B

Attempt any SIX questions

2. What is Operational Research? Explain the general methods for solving OR models.
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 giv 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.

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):
   a) EOQ
   b) Kendall's Notation for Queueing Model -
   c) Duality theorem

Group C

Attempt any TWO questions.

9. Using duality to solve the LLP.

   Minimize $z = 4x_1 + 2x_2 + 3x_3$

   Subject to $2x_1 + 4x_3 >= 5$

   $2x_1 + 3x_2 + x_3 >= 4$ and $x_1, x_2, x_3 >= 0$

10. Define various costs related to inventory. Explain the ABC analysis with better example.

11. a) A Scooter with first cost Rs. 80,000 has depreciation and service pattern as given below:

Year	1	2	3	4	5	6
Depreciation during year	28000	20000	14000	5000	4000	4000
Annual Service charge	18000	21000	25000	29000	34000	40000

How many years should the Scooter be kept in service before replacement?

b) Explain the theory of Two-Person Zero-Sum game with example.

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Semester: VIII

Subject: Database Programming

2017 Batch

Group B

Attempt any SIX questions

2. What is subquery? Explain it with example.
3. What is record in PLSQL? Explain different types of records used in PLSQL.
4. Define the variables and constants in PASOL Explain how variable is differ from constants.
5. Explain the components of package with example.
6. What is trigger in PLSQL? Explain the differences between Statement and Row level triggers?
7. What is function in PLSQL? Explain how it is differed from procedure.
8. Write a stored procedure to display the number of records in a table.

Group C

Attempt any TWO questions.

9. What is cursor in PLSQL? Why is it required? Explain the different steps of explicit cursor in PLSQL.
10. Explain different joins (Inner join (natural join), outer join (left outer, right outer, full outer), cross join) with example.
11. What is repetitive control statement? Explain different looping statements with example.

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Semester: VIII

Subject: Geographical Information System

2017 Batch

Group B

Attempt any SIX questions

2. Define GIS. Describe benefits of GIS.
3. Explain elements of map.
4. What is remote sensing? How remote sensing works?
5. What is digital terrain model? Describe its application.
6. Explain about the functional components of GIS.
7. Describe the characteristics of good database design.
8. Write short notes on (Any Two):
   a) Map layers
   b) Map projection
   c) Geodatabase

Group C

Attempt any TWO questions.

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

Tribhuvan University

Faculty of Humanities and Social Science

Semester: VIII

Subject: Information Security

2017 Batch

Group B

Attempt any SIX questions

2. What is Information Security? List and briefly define fundamental security design principles.
3. Explain HMAC with its objectives.
4. What are the vulnerabilities of passwords? Explain different strategies used for the selection of effective password.
5. Define access right. Explain the concept of trust framework.
6. Describe about honeypot with the types of honeypots that may be deployed.
7. How can you say that Intrusion Detection System is de backbone for Information Security? Justify along with its categories.
8. Explain the terms SSL, TSL and handshake protocol.

Group C

Attempt any TWO questions.

9. Define the terms threats and attacks in terms of Information Security. Explain different types of security threats in detail.
10. What is a cryptosystem? Explain the concepts of Vignere and Rail Fence Ciphers in detail.
11. What is a security audit? What is its importance? Explain the security auditing architecture in detail.

Tribhuvan University

Faculty of Humanities and Social Science

Semester: VIII

Subject: Machine Learning

2017 Batch

Group B

Attempt any SIX questions

2. What is Machine learning? Describe the types of learning.
3. What is clustering? Describe the approaches used for clustering.
4. What is sensitivity and specificity? Describe Confusion matrix with example.
5. What is linear regression? Explain gradient descent algorithm.
6. Describe training set, validation set and test set. Differentiate between training and testing.
7. Describe line of best fit.
8. What is naïve bayes algorithm? How does it work? What are its merits and demerits?

Group C

Attempt any TWO questions.

9. How does k-means algorithm work? Suppose following data. k = 2 use k-means algorithm to cluster
   O1(1, 1.5), O2(1, 4.5), O3(2, 1.5), O4(2, 3.5), O5(3, 2.5), O6(3, 4)
10. What is perceptron? Explain backpropagation algorithm with suitable example.
11. How dose SVM works? Describe functional margin, geometric margin and optimum margin classifier. Show the relationship between functional and geometrical margin.
