



Tribhuvan University
Faculty of Humanities & Social Sciences
OFFICE OF THE DEAN
2024 (2019 Batch)

Bachelor in Computer Applications
 Course Title: Operational Research
 Code No: CAOR 451
 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. Describe in brief, the tools and techniques of operation research. [2.5+2.5]
3. Explain ABC inventory planning system. An auto industry purchases spark plugs at the rate of Rs 25 per piece. The annual consumption of spark plug is 18000 numbers. if the ordering cost is Rs 250 per order and carrying cost is 25% p.a., what would be the EOQ? If the supplier of spark plugs offers a discount of 5% for order quantity of 3000 numbers per order, do you accept the discount offer? [1+4]
4. Reduce the following two person zero sum game to 2x2 order by dominance rule and obtain the optimal strategies for each player and the value of the game.

Player A	Player B			
	B ₁	B ₂	B ₃	B ₄
A ₁	3	2	4	0
A ₂	3	4	2	4
A ₃	4	2	4	0
A ₄	0	4	0	8

5. A radio machine on an average finds 5 customers coming to his shop every hour for repairing their radio sets. He disposes of each of them within 10 minutes on an average. The arrival and servicing times follow Poisson and exponential distribution respectively. In the light of the above facts determine:
 - a) Proportion of time during which his shop remains empty.
 - b) The average no. of customers in his system and queue.
 - c) The average time spent by a customer in the queue and the service as well.
 - d) The probability of finding at least five customers in his shop.
6. Carew's machine shop has four machines on which three jobs have to be done. Each job can be assigned to one and only one machine. The cost (in Rs) of each job on each machine is given below:

Job	Machines			
	P	Q	R	S
A	45	60	70	80
B	20	32	42	47
C	25	37	47	55

Req: What are the job assignments which will minimize the total cost?

7. Write the meaning of duality. What are the major steps of formulating dual linear programming problems? Justify with example. [1+3+1]
 8. Write short notes on. (any two) [2.5+2.5]
 a) Meaning of Degeneracy in Transportation Problem.
 b) Queuing Theory.
 c) Assignment Problem Algorithm.

Group C

Attempt any TWO questions.

[2×10 = 20]

9. What is game theory? State the assumption underlying it. Discuss its importance to business decisions. [2+4+4]
 10. Solve the following LP problems using the simplex method.

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

Subject to Constraints

$$2x_1 + x_2 \leq 5$$

$$x_1 + x_2 \leq 4$$

and

$$x_1, x_2 \geq 0$$

11. Jack Evan owns several trucks used to haul crushed stone to road project in the country. The road contractor for whom Jack hauls, N Teer, has given Jack this schedule for next week:

Project	Requirement per week	Plant	Available per week
A	50	W	45
B	75	X	60
C	50	Y	60

Jack figures his cost from the crushing plant to each of the road projects to be these:

Cost information (in RS)

To / From	A	B	C
W	4	8	3
X	6	7	9
Y	8	2	5

Req: Compute Jack's optimal hauling schedule for next week and his transportation cost.



Tribhuvan University
Faculty of Humanities & Social Sciences
OFFICE OF THE DEAN
2024 (2019 Batch)

Bachelor in Computer Applications
Course Title: Information Security
Code No: CACS 459
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]

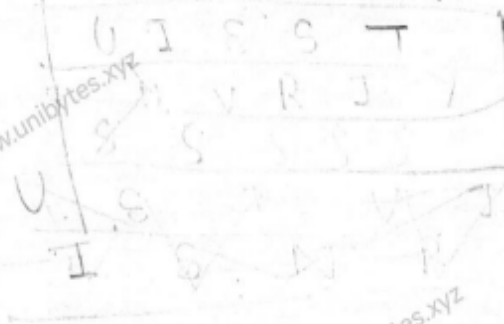
2. What is security services? Explain four fundamental security design principle. [1+4] 3 2
3. What do you mean by transportation cipher? Decrypt the cipher text UIESTNVRIY using the Rail fence cipher using rail size is 2. 3 [2+3]
4. What is Euler's totient function? Find multiplicative inverse of 87 in Z_{100} using Extended Euclidean algorithm. 3 [1+4]
5. What is Abelian group? Find whether 561 is prime or not using Miller-Rabin algorithm. [2+3]
6. What is Password aging? Explain process of biometric authentication. 3 [1+4]
7. What is malicious software? How worms are different from Trojan horses? 3 [1+4]
8. What is security Audit? Explain the architecture of security auditing. 3 [1+4]

Group C

Attempt any TWO questions.

[2×10 = 20]

9. How key generation, encryption and decryption is done in RSA. In a RSA cryptosystem, given $p=5$ and $q=19$, determine private key, public key and perform encryption and decryption for the message $m=4$. 4 [5+5]
10. Explain properties of hash functions. How hash value is generated using SHA-1 algorithm, explain with suitable diagram. [3+7]
11. What is difference between Access Control List (ACL) and Access Control Matrix (ACM)? Explain five services provided by PGP protocol to secure email. 4 [5+5]





Prepared by Uni Bytes / www.unibytes.xyz

Tribhuvan University
Faculty of Humanities and Social Science
Semester: VIII
Subject: Multimedia System
2019 Batch

Group B

Attempt any SIX questions

2. Define multimedia computing. Write the challenges for multimedia systems.
3. What is sound? Explain the speech generation method.
4. Difference between bitmap and vector graphics.
5. What are the multimedia interface components?
6. Compare arithmetic coding and Huffman Coding.
7. Discuss the colour dithering technique with example.
8. Calculate the file size in bytes for a 30 second recording at 44.1 khz, 8 bits resolution stereo sound.

Group C

Attempt any TWO questions.

9. Explain the JPEG compression process steps in detail with examples.
10. What do you mean by abstractions levels in multimedia? Explain each level in detail with an example.
11. Write and explain each phase of multimedia application development with example.

Don't Forget to Follow Uni Bytes



Tribhuvan University
Faculty of Humanities and Social Science
Semester: VIII
Subject: Database Programming
2019 Batch

Group B

Attempt any SIX questions

2. Explain Oracle database architecture in detail.
3. Explain the different DDL commands used in oracle.
4. What is identifier? Explain the different properties of identifier.
5. Explain the different types of collections in PLSQL.
6. Explain how user defined exception can be raised with example.
7. What is row level trigger? Explain BEFORE row triggers & AFTER row triggers with examples.
8. What are packages? What does a PL/SQL Package Consist of?

Group C

Attempt any TWO questions.

9. Differentiate between stored procedure and stored function with example. How parameterized stored procedure can be used? Explain with example.
10. Write the queries for following operations:
 - a) Create two tables (parent and child) maintaining referential integrity.
 - b) Display the record using inner join (natural join)
 - c) Demonstrate the Outer join (left outer, right outer and full outer join)
 - d) Demonstrate the cross join
11. Differentiate between implicit and explicit cursors. Write a program to display the name and salary of the employee using cursor explaining different control steps.

Don't Forget to Follow Uni Bytes



Tribhuvan University
Faculty of Humanities and Social Science
Semester: VIII
Subject: Knowledge Engineering
2019 Batch

Group B

Attempt any SIX questions

2. Discuss the advantages and limitations of using Knowledge-Based Systems in healthcare. Provide specific examples of how KBS can be applied in this domain.
3. What is Part-of-Speech (POS) tagging, and why is it important in Natural Language Processing? Provide an example of POS tagging for a simple sentence
4. Differentiate between Supervised and Unsupervised learning with example.
5. Explain the term "propositional logic" and its use in knowledge representation. How does it differ from predicate logic?
6. Compare and contrast the concepts of ontology and language in the context of Knowledge Engineering. How does each contribute to the representation and sharing of knowledge?
7. Describe the role of OWL (Web Ontology Language) in ontology engineering. How does it support the creation and use of ontologies?
8. Write short notes on (any two)
 - a) Random Forest
 - b) AI in Knowledge Engineering
 - c) social web

Group C

Attempt any TWO questions

9. Compare the performance of the Nearest Neighbor algorithm with other classification algorithms like Decision Trees and Support Vector Machines (SVM). Given the following dataset with two features (x1, x2) and a binary class label, use the k-Nearest Neighbor algorithm to classify a new data point. Calculate the Euclidean distance and determine the class of the new data point (5,6).

Don't Forget to Follow Uni Bytes

x1	x2	Class
2	3	A
4	7	B
5	5	A
6	8	B
7	2	A

10. Discuss the concept of the Semantic Web and its significance in modern data management and integration. Explain the role of RDF (Resource Description Framework) in the Semantic Web and how it facilitates the creation and use of linked data. Illustrate your answer with examples of practical applications where Semantic Web technologies, RDF, and Linked Data are effectively utilized.
11. Discuss the applications of Natural Language Processing (NLP) with a focus on how it leverages morphology, lexicon, syntax, and semantics. Provide examples of real-world applications where these components are crucial for processing and understanding human language.

Don't Forget to Follow Uni Bytes