

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (Sem.-1)
TECHNICAL COMMUNICATION

Subject Code : PGCA-1905

M.Code. : 79039

Date Examination : 18-05-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- a) What is the process of communication?
- b) What is emotional barrier to communication?
- c) Name the 7Cs.
- d) What is grapevine?
- e) What do you mean by communication flow?
- f) What is a resume?
- g) What is extempore?
- h) What is index?
- i) What is primary Bibliography?
- j) What is plagiarism?



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SECTION-A

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SECTION-B

2. Define Communication. Discuss in detail, the functions of communication.
3. What do you mean by Networks? Explain the importance of networks.
4. Write a descriptive paragraph on Your Graduation Ceremony.
5. **Write a precis of the following:**

There is an enemy beneath our feet—an enemy more deadly for his complete impartiality. He recognizes no national boundaries and no political parties. Everyone in the world is threatened by him. The enemy is the Earth itself. When an earthquake strikes, the world trembles. The power of a quake is greater than anything man himself can produce. But today scientists are directing a great deal of their effort into finding some way of combating earthquakes and perhaps at some time shortly, mankind will have discovered a means of protecting itself from earthquakes. An earthquake strikes without warning. When it does, its power is immense. If it strikes a modern city, the damage it causes is as great as if it has struck a primitive village. Gas mains burst, explosions are caused and fires are started. Underground railways are wrecked. Buildings collapse, bridges fall, dams burst and gaping crevices appear in busy streets.

SECTION-C

6. Draft a newsletter for your college activities this month, include at least five activities.
7. Write a memo for the accounts branch reprimanding them to prepare the accounts ledger in a proper and flawless manner.
8. Enumerate and explain the effective presentation techniques.
9. What are the basic essentials of Group discussion? Also discuss the don'ts of Group discussion.

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Total No. of Pages : 02

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MCA (Sem.-1)

ADVANCED DATABASE MANAGEMENT SYSTEM

Subject Code : PGCA-1953

M.Code : 79038

Date of Examination : 22-05-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1) Write short notes on :

- a) Data Independence
- b) Cardinality of Relation
- c) Referential Integrity Constraints
- d) Relational Calculus
- e) Cartesian Product
- f) Intra query parallelism
- g) Distributed Database Storage
- h) NoSQL Databases
- i) Document Type Definition (DTD)
- j) Distributed DBMS Commit Protocols.



SECTION-B

2. What is the purpose of database management system and its applications? Discuss in detail.
3. What is ER data model? Explain ER diagram with suitable example and their terminology.
4. What is the process of normalization? Explain type of normal forms and dependencies.
5. What is Concurrency? Discuss different concurrency control techniques.

SECTION-C

6. What are the types of parallel database? What is intra vs. inter parallelism?
7. What are the concepts of distributed databases? How queries are processed in DDBMS?
8. What is Big data and its types? Discuss open source NOSQL databases.
9. What are the types of XML databases? What is an XML schema type?



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MCA (Sem-1)
DISCRETE STRUCTURES AND OPTIMIZATION

Subject Code : PGCA-1917

M.Code : 79035

Date of Examination : 25-05-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write briefly :

- a) If $f, g : R \rightarrow R$ be defined by $f(x) = x^2 + 2x + 2, g(x) = 2x - 3$. Find fog, gog.
- b) Find generating function for series $-5, 25, -125, \dots$

c) Define B-Tree.

d) Consider following relation on set $A = \{1, 2, 3\}$, $S = \text{Empty relation}$, $T = \text{Universal Relation}$. Determine whether or not each of above relation on A is an equivalence relation.

e) Differentiate between POSET and equivalence relation.

f) Prove that maximum number of edges in a simple graph having n vertices is $n(n-1)/2$.

g) How many permutations of the letter ABCDEFGH contains the string ABC?

h) How many edges are there in a tree having n vertices.

i) Define kernel of a Homomorphism.

j) Give an example of a relation which is both symmetric and anti symmetric.

SECTION-B

2. a) Let R be relation on the set of ordered pair of positive integers such that $(a,b), (c,d) \in R$ if and only if $a+d=b+c$. Show that R is an equivalence relation.

b) Draw Hasse diagram for divisibility on D_{30} .

3. a) How many bit strings of length ten contains either three consecutive 0s or four consecutive 1s?

b) What is the minimum number of students required in a discrete mathematics class to be sure that at least six will receive the same grade, if there are five possible grades A, B, C, D and F.

4. a) Construct circuits from NOT, AND gates and OR gates to produce these outputs.

i) $x y z + x' y' z'$

ii) $((x'+z)(y+z))'$

b) Let $(A, +, \cdot)$ be a ring such that $a \cdot a = a$ for all a in A . Show that $a + a = 0$ for all a , where 0 is the additive identity. Also show that operation is commutative.

5. Solve recurrence relation $a_n = 4a_{n-1} - 4a_{n-2} + (n+1) \cdot 2^n$.

SECTION-C

6. Show that $<Z, + >$ is a group.

7. a) State and prove Lagrange's theorem.

b) Prove that equality relation is a congruence relation on any algebra

8. a) State and prove Euler's theorem.

b) Show that every connected graph with n vertices has at least $n-1$ edges.

9. a) Draw all subgraphs of the graph with edges $(d,a), (d,c)$ and (d,b) .

b) Determine whether the graph with the edges $(a,b), (a,c), (b,c), (b,d), (c,d), (d,e)$ has a Hamilton circuit.

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Total No. of Questions : 09

MCA (Sem.-1)
ADVANCED DATA STRUCTURES
 Subject Code : PGCA-1952

M.Code : 79037
 Date of Examination : 20-05-2023

Max. Marks : 70

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION - B & C have FOUR questions each.
- Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
- Select atleast TWO questions from SECTION - B & C.

SECTION-A

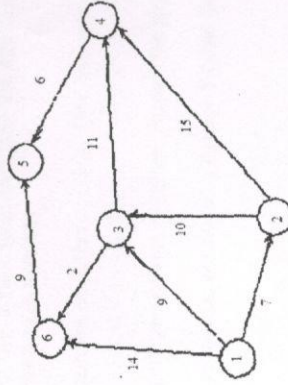
I. Write short notes on :

- What is the importance of Red Black tree?
- Explain Rehashing methods.
- Draw the single rotation for AVL tree.
- List out the properties of Red-Black trees.
- What is the main advantage of hashing?
- What are the applications of minimal spanning trees?
- What are the properties of B-Trees?
- Name the various algorithms for string matching.
- What are the ways to represent a graph in the memory of a computer system?
- What is working principle of Quick sort?

- What is an AVL tree? What are the types of rotations that may be performed on a AVL tree?
- Write the properties of B+T, AVL tree, B-Tree and Red-black tree.
- Develop a max heap from the following sequence of nodes and apply heap sort. Show all the intermediate steps.
 10 36 12 18 54 50 73 51 43 23 44
- What is the concept of Hashing? Explain various techniques used for hashing. How collisions are handled while addressing?

SECTION-C

6. Apply Dijkstra's algorithm on the following directed weighted graph with source 1.



- Explain the Knuth-Morris-Pratt algorithm for string searching through an illustrative example.
- Modify Dijkstra's algorithm to solve AFSP problem.
- What are minimal spanning trees? Compare the Kruskal's and Prim's algorithms for finding the Minimal Spanning tree from a graph.

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Roll No.

Total No. of Questions : 02

MCA (Sem.-1)
PROGRAMMING IN PYTHON
Subject Code : PGCA-1951
M. Code : 79036
Date of Examination : 16-05-2023

Time : 3 Hrs. Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

- I. Write short notes :
- a. List the limiting features of Python.
 - b. Illustrate how multiple assignment is done.
 - c. Differentiate between type casting and type coercion.
 - d. What are the various logical operators available in Python?
 - e. Explain the usage of break statement.
 - f. How are strings
 - i) Concatenated and
 - ii) Appended?
 - g. Demonstrate how lambda functions are used?
 - h. How are files deleted?
 - i. What do you mean by garbage collection?
 - j. How are class attributes edited?



SECTION-B

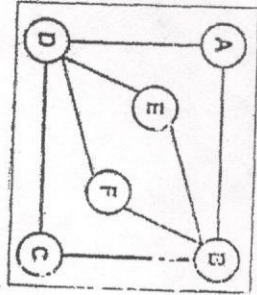
2. "Python is a complete programming language." Discuss the features of Python that makes it a powerful language. What are the limitations of Python? Write about the history and development of Python over past years.
3. What are the different types of variables available in Python? Write a program to read two floating point numbers. Add these numbers and assign the result to an integer.
4. What are the various conditional branching statements used in Python? Write a program to find the greatest number from three numbers using if-elif-else statement.
5. Write a detailed note on dictionary. Discuss various functions and methods of dictionaries with the help of examples.

SECTION-C

6. What is the need of user-defined functions? How are functions defined? Write a program that adds two numbers using function.
7. Write a detailed note on exception handling. How are user-defined exceptions defined and used?
8. Discuss the object oriented features of Python. Explain the process of creation of classes.
9. Discuss how files are opened and closed in Python. Explain the various access modes.

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9. Define Euler graph and discuss its applications. Also describe the difference between Euler path and circuit. Find the Euler path and circuit in the following graph.



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Dec-2022

Total No. of Pages : 04

MCA (Sem-1)
PROGRAMMING IN PYTHON
Subject Code : PCCA-1061
M. Code : 70036
Date of Examination: 12-01-2023

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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- SECTION - B & C. have FOUR questions each.
- Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
- Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on/Fill in the blank :

- Application of python
- Scope of variables in python
- List vs. tuple
- Decorators in Python.
- Non-associative operator
- Python input and output function
- Python package.
- Define class in Python
- Constructors in python
- init method.

SECTION-C

- What is python module and briefly explain the ways of importing a module?
- Briefly explain any four string object methods.
- Briefly explain the difference between pass by value and pass by reference with suitable example.
- Briefly explain lambda function in python with suitable example. Also explain filter(), map() and reduce() functions.
- Write a short note on :
 - Built in vs. user defined exceptions.
 - Garbage collection

SECTION-B

- Briefly describe the features of python language and how it is different from other languages?
- How to set up path and environment variables in python?
- What are mutable data types in python? Also, explain the differences between these mutable data types.
- Briefly explain python control statements and why they are needed. Discuss various control statements used in Python.
- Explain any four methods on each of the following storage collection types
 - file
 - set
 - dictionary with examples.



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Total No. of Questions : 09

MCA (Sem.-1)
TECHNICAL COMMUNICATION
Subject Code : PGCA-1905
M.Code. : 79039
Date Examination : 11-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :
 - a) Purpose of listening
 - b) Advantages of writing skills
 - c) Hearing vs. Listening
 - d) Coherence in writing
 - e) Précis Writing
 - f) Purpose of Abstract in Report Writing
 - g) Communication
 - h) Paralanguage
 - i) Newsletter
 - j) Memo.



SECTION-B

2. What are the types of Listeners? Explain Barriers to Listening.
3. Explain the essentials of communication (7C's of Effective Communication).
4. Write a Paragraph on '*The Roles of IT (Information Technology) in Education*'.
5. Write a letter to a dealer asking for a discount of 15% for office tables.

SECTION-C

6. Write a memo from the Manager to the Supervisor on not completing his task on time.
7. Discuss the format of formal report.
8. What is a personal resume? What is its significance in business writing?
9. What is an e-mail? Write an email asking for a job vacancy to the HR manager of a company.

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MCA - May - 2022

Roll No.

Total No. of Questions : 09

Total No. of Pages : 03

MCA (Sem.-1)

DISCRETE STRUCTURES AND OPTIMIZATION

Subject Code : PGCA-1917

M.Code : 79035

Date of Examination : 02-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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SECTION-A

I. Explain the following :

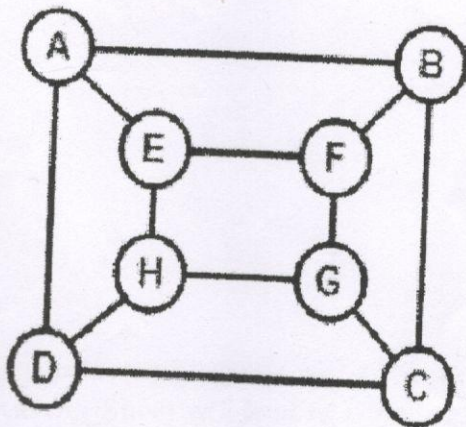
- a) Indegree and outdegree of a graph
- b) Hashing functions
- c) Partial order relations
- d) DeMorgans' law of Boolean algebra
- e) Define homomorphism with example
- f) Abelian group
- g) Define chromatic number
- h) Define lattice with example
- i) Define power set
- j) Hamiltonian circuit.

SECTION-B

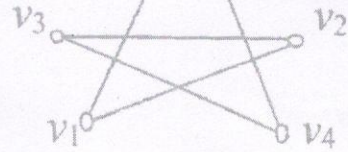
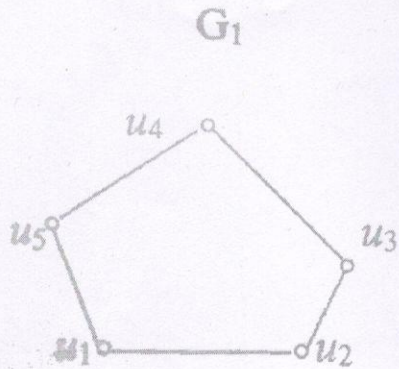
2. For each of the following relations R on Z , determine whether the relation is reflexive, symmetric or transitive and specify the equivalence classes if R is an equivalence relation on Z :
- $(a, b) \in R$ if a divides b
 - $(a, b) \in R$ if $a^2 = b^2$
3. Convert the following Boolean expression into standard Product of Sum (POS) form
- $\overline{A}BC = \overline{A}\overline{B} + AB\overline{C}D$
 - Reduce this Boolean expression by Demorgan law
 $(AB'.(A + C))' + A'B.(A + B + C)'$
4. A large software development company employs 100 computer programmers, out of them, 45 are proficient in Java, 30 in C#, 20 in Python, 6 in C# and Java, 1 in Java and Python, 5 in C# and Python, and just 1 programmer is proficient in all three languages above. Determine the number of computer programmers that are not proficient in any of these three languages. Also draw the Venn diagram of this question.
5. What is the solution of the recurrence relation $a_n = -a_{n-1} + 4a_{n-2} + 4a_{n-3}$ with $a_0 = 8$, $a_1 = 6$ and $a_2 = 26$.

SECTION-C

- State the clear difference between group, semigroup and monoid with suitable example.
- Consider an algebraic system $(N, +)$, where the set $N = \{0, 1, 2, 3, 4, \dots\}$. The set of natural numbers and $+$ is an addition operation. Determine whether $(N, +)$ is a monoid.
- Define Hamiltonian path in a graph and how it is different than Euler path? Explain it with a help of suitable example.
 - Identify the Hamiltonian path and circuit in the figure below.



Define isomorphism in graph with a suitable example. State the conditions which need to be fulfilled by two graphs in order to be isomorphic. Prove that the G_1 and G_2 are isomorphic.



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MCA (Sem.-1)

ADVANCED DATA STRUCTURES

Subject Code : PGCA-1952

M.Code : 79037

Date of Examination : 06-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- a) What do you mean by amortized analysis? Explain.
- b) Explain the importance of counting sort.
- c) What are the advantages of open addressing?
- d) Explain the properties of AVL tree.
- e) List and explain any two string functions.
- f) Which algorithm is used to solve all pairs shortest path problem?
- g) What is graph?
- h) What is binomial heap?
- i) List the applications of Minimum Spanning Tree (MST).
- j) Write the time complexity of Brute force algorithm in string matching.

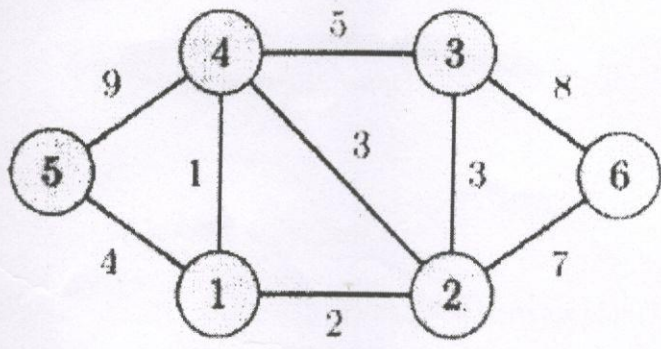


SECTION-B

- 2) Show the following :
 - a) $n^2 + 50n = O(n^2)$
 - b) $n^2 + n^2 + n^2 = 3n^2 = O(n^2)$
- 3) If the following sequence of numbers is to be sorted using quick sort, then show the iterations of the sorting process.
42,34,75,23,21,18,90,67,78
- 4) Explain the following with the help of an example :
 - a) Open addressing
 - b) Perfect hashing.
- 5) What item is at the root after the following sequence of insertions into an empty splay tree: 1, 11, 3, 10, 8, 4, 6, 5, 7, 9, 2. Provide the detailed tree structure (step-wise).

SECTION-C

- 6) Solve minimum spanning tree of the following graph.



- 7) Differentiate between adjacency matrix and adjacency list representation with the help of an example.
- 8) Explain Rabin Karp string matching algorithm along with an example.
- 9) How does Knuth Morris-Pratt (KMP) algorithm works? Explain along with an example.

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MCA (Sem.-1)

ADVANCED DATABASE MANAGEMENT SYSTEM

Subject Code : PGCA-1953

M.Code : 79038

Date of Examination : 09-08-22

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

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3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

- 1) Write short notes on :
 - a) RDBMS and DBMS
 - b) Cardinality
 - c) Normalization
 - d) Relational Algebra
 - e) Transaction management
 - f) Parallel database
 - g) Distributed transaction
 - h) Temporal hierarchies
 - i) Spatial relationships
 - j) XML Schema.



SECTION-B

- 2) Discuss the main characteristics of database approach and how it differs from traditional file system?
- 3) A set of FD's for the relation R {A, B, C, D, E, F} is
 $AB \rightarrow C, C \rightarrow A, BC \rightarrow D, ACD \rightarrow B, BE \rightarrow C, EC \rightarrow FA, CF \rightarrow BD, D \rightarrow E$ Find a minimum cover for this set of FDs.
- 4) Differentiate between Strict two-phase locking protocol and conservative two-phase locking protocol for concurrency control in databases with the help of an example.
- 5) Explain in detail various types of relational query languages.

SECTION-C

- 6) Write short notes on :
 - a) Categories of Data models.
 - b) Multimedia Databases.
 - c) Spatial Databases.
- 7) What do you understand by distributed databases? Give the various advantages and disadvantages of distributed database management systems.
- 8) Explain NOSQL Database with example.
- 9) Discuss the difference between intra query parallelism and intra operation parallelism.

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Dec. 2021 Jan 2022



Roll No.

Total No. of Pages : 01

Total No. of Questions : 08

Master of Computer Application (Sem.-1)

ADVANCED DATA STRUCTURES

Subject Code : PGCA-1952

M.Code : 79037

Date of Examination : 07-02-22

Time : 2 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 14 marks.

1. Explain with example bucket sorting algorithm.
2. What are AVL trees? Explain its RR, LL, LR and RL rotations.
3. Differentiate between Probabilistic and Competitive analysis.
4. What is a heap and its types? How to insert and delete the nodes from heap?
5. Write an algorithm to perform quick sort with example.
6. Differentiate between depth-first and breadth-first search algorithms.
7. Discuss in detail Brute Force Algorithm.
8. Write algorithms of string copy and string concatenation.

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Any student found making any change/addition/modification in contents of scanned copy of answer sheet and original answer sheet, shall be covered under UMC provisions.

Dec 2021 Jan 2022

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Total No. of Pages : 02

Total No. of Questions : 08

Master of Computer Application (Sem.-1)

TECHNICAL COMMUNICATION

Subject Code : PGCA-1905

M.Code : 79039

Date of Examination : 11-02-22

Time : 2 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 14 marks.
1. Define communication. Explain its process, indicating clearly the role of each constituent element.
2. a) Write a detailed note on the principles of effective communication.
b) Discuss various components of non-verbal communication.
3. As the Secretary of the Residents Association of your colony, prepare a circular for all residents regarding the conversion of copper cables into fiber optic cables so that no resident has any problem with the quality of communication services. In your circular, mention whether additional funds will be required and explain how the conversion process will not disrupt the lives of the residents in any way.
4. Imagine that you visited a place of tourist interest. Write a paragraph of about 350 words on your travel experience and what you learnt from it.
5. Assuming that you are the Administrative Officer of Finesse Garments, Kondapur, Hyderabad, write an enquiry letter for the following items with the Royal Furniture Mart, Ameerpet, Hyderabad : Office Chairs 40, Office Tables 20, File Racks 25, Steel Almirahs 10, Open Shelf 5.
6. Assume that you have planned to apply for various posts. You have just completed Post-graduation. You have secured first rank. You have received a gold medal in your post-graduation, participated in extra-curricular activities and in group discussions and achieved many prizes. Now, prepare a resume and a cover letter.
7. State the reason why, in business, the term 'presentation' has come to be used more commonly than 'public speaking'. What are the various steps involved in planning out a presentation?

8. Write a precis of the following passage and suggest a suitable title :

Communication is essentially a social affair. Man has evolved a host of different systems of communication which render his social life possible-social life not in the sense of living in packs for hunting or for making war, but in a sense unknown to animals. Most prominent among all these systems of communication is, of course, human speech and language. Human language is not to be equated with the sign systems of animals, for man is not restricted to calling his young, or suggesting mating, or shouting cries of danger; he can with his remarkable faculties of speech give utterance to almost any thought. Like animals, we too have our inborn instinctive cries of alarm, pain, etc., say Oh! Ah! we have smiles, groans, and tears; we blush, shiver, yawn, and frown. A hen can set her chicks scurrying up to her, by clucking communication established by release mechanism-but human language is vastly more than a complicated system of clucking. The development of language reflects back upon thoughts; for with language thoughts may become organised, new thoughts evolved. Self-awareness and the sense of social responsibility have arisen as a result of organised thoughts. Systems of ethics and law have been built up man has become self-conscious, responsible, a social creature. Speech and writing are by no means our only system of communication. Social intercourse is greatly strengthened by habits of gesture-little movements of the hands and face. With nods, smiles, frowns, hand-shakes, kisses, first shakes, and other gestures we can convey most subtle understanding. Also, we have economic systems for trafficking not in ideas but in material goods and services; the tokens of communication are coins, bonds, letters of credit, and so on. We have conventions of dress, rules of the road, social formalities, and good manners; we have rules of membership and function in business, institutions, and families. But life in the modern world is coming to depend more and more upon 'technical' means of communication, telephone and telegraph; radio and printing. Without such technical aids, the modern city-state could not exist one week, for it is only by means of them that trade and business can proceed; that goods and services can be distributed where needed; that railways can run on a schedule; that law and order are maintained; that education is possible. Communication renders true social life practicable, for communication means organisation. Communication engineers have altered the size and shape of the world.

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Total No. of Pages : 02

Total No. of Questions : 08

Master of Computer Application (Sem.-1)

PROGRAMMING IN PYTHON

Subject Code : PGCA-1951

M.Code : 79036

Date of Examination : 03-02-22

Time : 2 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 14 marks.
 1. a) Write a function in Python, INSERTQ(A,data) and DELETEQ(A) for performing insertion and deletion operations in a Queue. A is the list used for implementing queue and data is the value to be inserted.
 - b) How can you traverse, insert and delete elements from an array using inbuilt functions. Elaborate using Python code.
 2. a) Write a Python program to delete the first occurrence of the given word in a List, where words can repeat. .
 - b) Write a Python program to check whether a string is a palindrome or not using recursion.
 - c) Write a Python program to sort a list according to the length of the elements.
3. Define Exception. How can you catch a specific type of exception in Python? Elaborate, How can you assign a name to the Exception object in Python? List and explain different types of exceptions in Python.
 4. Write an example of a class in Python. Explain concept of Inheritance with example in Python. How can it achieve data abstraction? Discuss.
 5. a) What are the various String operators in Python? Illustrate.
 - b) How can you create or use calendar class in Python? Write code for creating calendar using Python.
 6. a) Write a Python program to order Tuples using an external list given during run time.
 - b) What is need of dictionaries? Write a Python program to read list of Dictionaries from file.

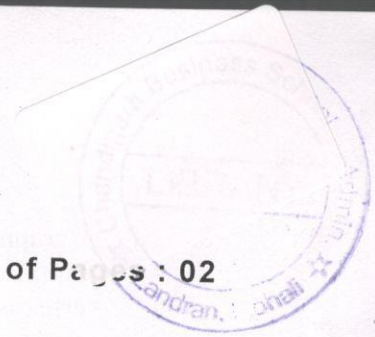
7. What is the need of creating modules in Python? How they are different from functions? Illustrate using Python code. How will you search path for a module? Write advantages of Python packages.
8. a) Why do we need environment variables in setting up Python?
b) Differentiate between Associative and Non Associative Operators.
c) What is the need of Data type conversion? Write Python code to differentiate between implicit and explicit data type conversion.

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Total No. of Pages : 02

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Master of Computer Application (Sem.-1)
DISCRETE STRUCTURES & OPTIMIZATION

Subject Code : PGCA-1917

M.Code : 79035

Date of Examination : 01-02-22

Time : 2 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 14 marks.

1. a) Prove the following :

$$X \cap (Y \cup Z) = (X \cap Y) \cup (X \cap Z)$$

b) How many symmetric relations will there be on a set of three elements?

2. Investigate the function $f(x) = x^2 + 3x + 2$ for increasing and decreasing function in its entire domain.

3. Prove that the set $\{0,1,2\}$ forms a field with respect to addition and multiplication modulo 3.

4. a) Simplify the following Boolean functions using the Karnaugh map :

$$F = x' y' z' + x' y z' + x y z' + x y' z'$$

b) Find the number of diagonals of a polygon having n sides.

5. Prove that every group of prime order is cyclic.

6. a) In how many ways can 5 boys and 5 girls be arranged in a round table so that 2 girls are not seated together?

b) Solve the following recurrence relations :

$$a_r = 6a_{r-1} - 8a_{r-2}, \text{ given that } a_0 = 4 \text{ and } a_1 = 10$$

7. Prove that in a graph G the number of vertices having an odd degree is always even.

8. a) A graph G is disconnected if and only if its vertex set V is partitioned into two non-empty, disjoint subsets V_1 and V_2 such that there exists no edge in G whose one end vertex is in V_1 and the other is in V_2 .
- b) Define a regular graph and a complete graph. Draw a regular graph that is also complete.

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Total No. of Pages : 02

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Master of Computer Application (Sem.-1)
ADVANCED DATABASE MANAGEMENT SYSTEM

Subject Code : PGCA-1953

M.Code : 79038

Date of Examination : 09-02-22

Time : 2 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 14 marks.

1. What is DBMS? Explain the different components of DBMS. What are the advantages of DBMS over Traditional File Processing system?

2. What is an ER model? What are the different types of attributes and how are they represented in ER diagrams? Explain the concept of strong and weak entity sets with the help of examples.

3. What is Functional Dependency? Explain in detail the first three Normal Forms and the Boyce Codd Normal form (Along with anomalies and examples).

4. Define Relational Algebra. Explain the fundamental operations of Relational Algebra with the help of examples.

5. a) What is a Parallel Database? What are the benefits of Parallel Database?
b) Discuss the locking protocols used in distributed serializability.

6. a) What are the advantages of a distributed database management system over a centralized DBMS?
b) Explain Concurrency Control and Recovery in Distributed Databases.

7. What is a Spatial Database System? Explain the different spatial data types, data structures and methods of storage.

8. Explain in detail multidimensional database system. Also explain what are NOSQL databases?

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SECTION-B

11. a) What is effective communication? Explain with the help of suitable example.
b) Explain the essentials of effective communication along with 7 C's and other principles.
12. What is technical paragraph writing? Discuss the descriptive and imaginative writing.
13. Write a technical letter to the newspaper editor regarding printing mistakes in the newspaper atleast in two different formats.
14. Explain Shannon's model of communication.

SECTION-C

15. Write the (at least 2) difference between the following :
 - a) Press release and newsletters
 - b) Dissertation and thesis
16. Write a technical proposal to government of India for the grant of high school. Explain it with instruction manuals with technical descriptions.
17. Define verbal communication and its importance. Discuss different presentation techniques and its benefits with example.
18. What is group discussion? Discuss the importance of group discussion and how it is helpful in interviews.

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Total No. of Pages : 02

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M.Sc. (IT) / MCA / PGDCA (2019 Batch) (Sem.-1)
RDBMS

Subject Code : PGCA-1904

M.Code : 76974

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

Answer the following questions in brief :

1. What is data mining?
2. What are the different types of languages which are available in the DBMS?
3. What is the difference between Primary key and Candidate key?
4. What are specialty databases?
5. How to ensure data recovery?
6. What are the differences between DROP, TRUNCATE and DELETE commands?
7. What is the meaning of an entity in ER diagram?
8. What are ACID properties in DBMS? List each one.
9. What is the difference between embedded SQL and dynamic SQL?
10. What is meant by integrity constraints?

SECTION-B

11. Explain the three-schema architecture with reference to data independence in DBMS. Justify your answer properly.
12. Discuss in detail :
 - a) Database storage
 - b) Database indexing and retrieval
13. Explain the concept of transaction management in DBMS using a real life example. Why conflict serializability is important?
14. Discuss various aggregate functions available in SQL. Also throw some light on the concept of join expressions.

SECTION-C

15. Explain the following :
 - a) Schema
 - b) View
 - c) Instance
 - d) Null values
 - e) Foreign key
16. Why normalization is required? Explain various normal forms available in DBMS in detail.
17. What are the features of a good relational design? Explain by citing instances.
18. Discuss various concurrency control techniques in detail.

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Total No. of Pages : 02

Total No. of Questions : 18

M.Sc. (IT)/MCA/PGDCA (2019 Batch) (Sem.-1)

OPERATING SYSTEM

Subject Code : PGCA1903

M.Code : 76973

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

Write briefly :

1. RTS
2. Thread
3. Segmentation
4. RAID
5. Virtual memory
6. Time sharing
7. Context switch
8. Distributed OS
9. Mutual exclusion
10. Dirty bit

SECTION-B

11. Why OS is termed as resource allocator? Also compare RTS and Time sharing systems.
12. Write overviews of Inter process Communication and synchronization.
13. What is deadlock? How it is prevented and avoided?
14. Find waiting and turnaround time for the given processes using FCFS and SCF algorithms.

Process	Arrival Time (ms)	Burst Time (ms)
P1	1	5
P2	2	4
P3	2	7
P4	3	2

SECTION-C

15. Explain various page replacement algorithms used in demand paging.
16. Explain various levels of RAID structure.
17. Write a detailed note on security threats on Operating System.
18. Explain various types of fragmentation algorithms.

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M.Sc. (IT) / MCA / PGDCA (2019 Batch) (Sem.-1)

MATHEMATICS

Subject Code : PGCA-1901

M.Code : 76971

Time : 2 Hrs.

Max. Marks : 35

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 7 marks.

1. Is 2352 is perfect square? If not find smallest multiple of 2352 which is perfect square. Find square root of the new number.
2. a) Find cube root of 13824.
b) Find the value of $\frac{\sqrt[3]{729} - \sqrt[3]{27}}{\sqrt[2]{144} + \sqrt[3]{64}}$.
3. a) Show that if A and B are any two sets, then prove that $A - B = A - (A \cap B)$.
b) Which of the following sets are equal?
 $A = \{x : x^2 + 5x + 6 = 0, x - 3 = 0\}$, $B = \{x : x \in \mathbb{N}, x < 5\}$, $C = \{x : x \in \mathbb{N}, x \text{ is a prime number } < 5\}$.
4. a) How many subsets can be formed from a set of n elements? How many of these will be proper and how many improper?
b) Define symmetric difference of sets? Also find the symmetric difference of $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{4, 5, 6, 7, 8, 9\}$.
5. a) Prove that $p \vee \sim(p \wedge q)$ is tautology.
b) State and prove De-Morgan's law with help of Logics.
6. a) Show that $(p \wedge q) \rightarrow r$ and $(p \rightarrow r) \wedge (q \rightarrow r)$ are not equivalent.
b) Determine whether $(\sim q \wedge (p \rightarrow q)) \equiv \sim p$.
7. a) If $A = \begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$ and $B = \begin{bmatrix} 9 & 1 \\ 7 & 8 \end{bmatrix}$, Find matrix C such that $A - 5B + C = I$, where I is identity matrix.
b) State and prove two properties of Transpose of a matrices.

8. a) Given that $A = \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 & 4 \\ 3 & 2 & 0 \end{bmatrix}$, Find $A'B$ and $B'A$. Is $A'B'$ is defined.

b) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$, Is it true $(A + B)^2 = A^2 + B^2 + 2AB$.

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Total No. of Pages : 02

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M.Sc. (IT)/MCA/PGDCA (2019 Batch) (Sem.-1)
**FUNDAMENTALS OF COMPUTER AND PROGRAMMING IN
PYTHON**

Subject Code : PGCA1902

M.Code : 76972

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

Explain the following :

1. Software
2. Memory
3. OMR
4. Interface
5. Printer
6. Big Data
7. Variable
8. Lifetime
9. Package
10. Class and Object

SECTION-B

- Q11. What are the attributes of a class? How they are accessed and edited?
- Q12. Discuss any 3 input and 3 output devices.
- Q13. Write a note on memory hierarchy.
- Q14. Write a note on Big Data, IoT and Data Mining.

SECTION-C

- Q15. What are different types of loops in python? Explain with help of example.
- Q16. Differentiate between call by value and call by reference in python.
- Q17. What is a module? How it is created and why we need it?
- Q18. What are the operations on files? Explain with help of example.

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MCA (2015 to 2018) (Sem.-1)
OBJECT ORIENTED PROGRAMMING IN C++
Subject Code : MCA-102
M.Code : 72708

Time : 2 Hrs.

Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 6 marks.

1. What is classes and what are its various types of members? Give relevant examples to explain.
2. Write a class to represent a vector (a series of float values). Include member functions to perform the following tasks :
 - a) To create the vector
 - b) To modify the value of a given element
 - c) To multiply by a scalar value
 - d) To display the vector in the form (10, 20, 30,...) Write a program to test your class.
3. What is a constructor and destructor? What is the use of default & copy constructors? Is a constructor mandatory for a Class.? Explain by giving examples in each case.
4. What are the various bit wise operators? Explain with example.
5. What do you understand by inheritance? Give its various types and access mechanisms.
6. Explain how base class member functions can be invoked in a derived class if the derived class also has a member function with the same name.
7. Write a program in C++ to overload the +, -, ×, % operator to find the addition, subtraction, multiplication and division of Complex numbers.
8. Write a program to copy the content of a data file to another file. Make use of the exception handling conditions also.

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Total No. of Pages : 02

Total No. of Questions : 18

MCA (2015 to 2018) (Sem.-1)
INFORMATION MANAGEMENT

Subject Code : MCA-101

M.Code : 72707

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks and students have to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

- Q1. What are various types of data file formats? Explain with the help of suitable examples. (10)
- Q2. a) Explain the working principle of flash drives. How data is read from and written into a flash drive? (06)
- b) What are different types of software? How are they useful? (04)

SECTION-B

- Q3. What is the difference between information and knowledge? Explain various techniques to derive information. (10)
- Q4. What are various data models? Discuss with the help of suitable example(s). (10)

SECTION-C

- Q5. What is meant by decision making? How is it used in Management Information System (MIS)? (10)
- Q6. How a Knowledge Management System is designed? Explain various components of a Knowledge Management System. (10)

SECTION-D

- Q7. Explain the Architecture of Content Management system with the help of a block diagram. (10)
- Q8. How to create a Pivot Table in spreadsheet? Explain with the help of suitable example(s). (10)

SECTION-E

(2×10=10)

Answer in brief :

- Q9. Optical disk
- Q10. 3rd Generation vs. 4th Generation computers
- Q11. Broadband
- Q12. Telecommunication infrastructure
- Q13. Business process
- Q14. Operations security
- Q15. Mail merge in Word processing
- Q16. Use of macros in spreadsheet
- Q17. Animation in presentation
- Q18. Business intelligence

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May - 2019

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (2015 & Onwards) (Sem.-1)
COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE
Subject Code : MCA-103
M.Code : 72709

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students have to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

- Q1. What is the significance of Computer Organization? Discuss the following:
- a) General Register Organization
 - b) Stack Organization.
- Q2. Differentiate the following :
- a) Memory Reference Instructions and Register reference Instructions
 - b) Two address and Three address Instructions

SECTION-B

- Q3. What are the benefits of parallel processing? Discuss the role of :
- a) Arithmetic Pipeline
 - b) Instruction Pipeline
- Q4. Discuss the functionality of the following :
- a) DMA Controller
 - b) Interrupt Cycle

SECTION-C

Q5. Describe the use of the following types of mapping techniques :

- a) Associative Mapping
- b) Direct Mapping

Q6. a) What is meant by cache coherence? Explain.

b) What is the need of page replacement in memory management? Explain.

SECTION-D

Q7. Explain different characteristics of time shared common bus and crossbar switch.

Q8. a) What are hypercube interconnections? Elaborate interprocessor communication in hypercube.

b) Discuss various data transfer instructions available in Assembly language programming.

SECTION-E

Q9. Write briefly :

- a) What is control word?
- b) Define Instruction Format.
- c) Name two properties of Pipelining.
- d) List few Vector processing operations.
- e) What is Priority Interrupt controller?
- f) How address mapping is carried out in set associative mapping?
- g) Define Multiport Memory.
- h) Why register addressing mode is faster than other addressing modes?
- i) Discuss the purpose of having switching networks in multiprocessor systems.
- j) List various I/O instructions used in Assembly level programming.

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Total No. of Pages : 02

Total No. of Questions : 09

MCA (2013 and 2014 Batch) (Sem.-1)

TECHNICAL COMMUNICATION

Subject Code : MCA-105

M.Code : 26046

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TWENTY marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

1. Elaborate internal functions of communication.
2. Discuss different theories of communication.

SECTION-B

3. Write a paragraph on any one of the following :
VALUE OF DISCIPLINE or HAVE WE BECOME SLAVES TO GADGETS.
4. Draft a business letter requesting dealers of your company to promote sales of different products of the company. Imagine details.

SECTION-C

5. Draft your resume in response to an advertisement for the post of a system analyst.
6. (a) As GM, draft an email to all the data entry operators of your company asking them to be careful about compiling data as mistakes are being detected regularly. Invent details.
(b) Draft a notice inviting all the Assistant Managers for a meeting. Imagine details yourself.

SECTION-D

7. Elaborate in detail what should be kept in mind while appearing in an interview.
8. Discuss presentation techniques which make presentations effective.

SECTION-E

9. Write briefly :

- a) What is the importance of flow in communication?
- b) Define non-verbal communication.
- c) List important things to be kept in mind while making a precis.
- d) Define a memo.
- e) What are references? Cite an example.
- f) Discuss how to plan meetings.
- g) Define technical description. List its some features.
- h) Differentiate between a descriptive and an imaginative paragraph.
- i) Give a brief account of barriers to communication.
- j) Give some features of MS-Word.

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MCA (2015 & Onwards) (Sem.-1)
OBJECT ORIENTED PROGRAMMING IN C++
Subject Code : MCA-102
M.Code : 72708

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.
3. Use of non-programmable scientific calculator is allowed.

SECTION-A

1. What is the advantage of using OOP over functional programming? Explain.
2. a. WAP to print minimum of 3 integers using conditional operator.
b. WAP to compute sum of $1+2+\dots+n$ for input integer n.

SECTION-B

3. What is passing by constant reference? Explain with suitable example.
4. a. WAP to traverse an array using pointers.
b. WAP to pass an array to a function that returns the same.

SECTION-C

5. What is the difference between multiple and multi-level inheritance? Explain with examples.
6. Differentiate between the use of constructor and destructor with examples.

SECTION-D

7. What is polymorphism? How to implement using virtual function? Explain with an example.
8. a. WAP to overload assignment operator.
b. WAP to read and write to text file.

SECTION-E

9. Write briefly :
 - a. What is type definition?
 - b. Explain use of Get function.
 - c. What is use of inheritance in OOP?
 - d. Explain Class template.
 - e. Explain Pure virtual function.
 - f. Explain Abstract class.
 - g. What is deference operator?
 - h. Differentiate between new and delete operator.
 - i. What is Enumeration Datatype?
 - j. Explain use of Goto statement.

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May - 2019

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Total No. of Questions : 09

MCA (2015 & Onwards) (Sem.-1)
ACCOUNTING & FINANCIAL MANAGEMENT
Subject Code : MCA-104
M.Code : 72710

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTYmarks in all.

SECTION-A

1. "Accounting concepts are like scientific rule, which are time tested and applicable universally across the boundaries and in different situations, where as conventions are certain accounting policies and procedures which are followed as a matter of practice is the business organizations". Discuss.
2. From the following Trial Balance of RadheShyam Trading and Profit and Loss A/c for the year ending 31st December, 2010 and Balance Sheet as on that date. The Closing Stock on 31st December, 2010 was valued at Rs.2,50,000.

Debit Balances	Amount (Rs.)	Credit Balances	Amount (Rs.)
Stock (1-1-2010)	2,00,000	Sundry Creditors	1,50,000
Purchases	7,50,000	Purchases Return	30,000
Sales Return	80,000	Sales	25,00,000
Freight and Carriage	75,000	Commission	33,000
Wages	3,65,000	Capital	17,00,000
Salaries	1,20,000	Interest on Bank Deposit	20,000
Repairs	12,000	B/P	62,000
Trade Expenses	40,000		
Rent and Taxes	2,40,000		
Cash in Hand	57,000		
B/R	40,000		
	5,50,000		
Plant and Machinery	16,00,000		
Withdrawals (Drawings)	1,66,000		
Bank Deposit	2,00,000		
	44,95,000		44,95,000

SECTION-B

3. Define the concept of finance. Discuss in detail relationship of financial management to economics and accounting. What forces are prodding companies in India to accord greater importance to the goal of shareholder wealth maximization? Comment on the emerging role of financial manager in India.
4. The following is the position of Current Assets and Current Liabilities of M Ltd.

Particulars	2006 Rs.	2007 Rs.
Provision for Bad Debts	1,000	3,000
Short-term Loan	10,000	19,000
Creditors	15,000	10,000
Bills Receivable	20,000	40,000

The company incurred a loss of Rs.45,000 during the year. Calculate the Net Cash Flows from the Operating Activities by Indirect Method. Discuss in detail advantage and limitations of cash flow statement.

SECTION-C

5. A Company producing two products X and Y faces the problem of labour shortage. Maximum labour hours available in a month are 10,000 hours. The following other information is available:

	Product X (Rs.)	Product Y (Rs.)
Material Cost	6.00	6.00
Direct Labour Cost		
10 hour @ Rs. 1.00	10.00	
5 hours @ Rs. 1.00		
Variable Overheads	4.00	2.00
Fixed overheads	5,000	5,000
Selling price	30.00	20.00

Show which product is more profitable. Give proof in support of your answer.

6. The following data is obtained from the books of manufacturing concern :

	Men	Women
Number in the standard gang	24	14
Standard rate per hour	Rs. 8	Rs. 7
Number in the actual gang	18	16
Actual rate per hour	Rs. 9	Rs. 6

During a week, 2 hour were lost due to power failure and work was actually done for 40 hours. Calculate labour mix variance and idle time variance.

Nov-2019

Roll No.

Total No. of Pages : 03

Total No. of Questions : 09

M.Sc.(IT)/MCA/PGDCA (2019 Batch) (Sem.-1)

MATHEMATICS

Subject Code : PGCA-1901

M.Code : 76971

Time : 3 Hrs.

Max. Marks: 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Solve the following :

a) Perform indicated operation $\frac{3-2/3}{5+5/6}$.

b) Solve $\frac{3\sqrt{2}-4\sqrt{3}}{4\sqrt{2}+3\sqrt{3}}$

c) Write the solution set of the equation $2x^2 + 3x - 2 = 0$ in roster form.

d) If R is the set of real numbers and Q is the set of rational numbers, then what is $R - Q$?

e) Write the subsets of the set $\{a, b\}$.

f) Find negation of "At least 10 inches of rain fell today in Mumbai"

g) Show that $a \wedge b = b \wedge a$.

h) Find components of the statement "The number 100 is divisible by 3, 11 and 5".

i) Define Transpose and Scalar matrices

j) Evaluate $\begin{bmatrix} 1 & -3 & 5 \\ 4 & 6 & 0 \\ 8 & -2 & 3 \end{bmatrix} \begin{bmatrix} 1 \\ 3 \\ 0 \end{bmatrix}$.

SECTION-B

2. a) Expand $(1+\sqrt{2})(3-\sqrt{2})$.

b) Simplify $\sqrt[3]{12} \cdot \sqrt[3]{36} + \frac{4-\sqrt{3}}{5\sqrt{3}}$.

3. a) Define Natural number, Real numbers and Irrational numbers with examples.

b) If $X = \{a, b, c, d\}$ and $Y = \{f, b, d, g\}$, find (i) $X - Y$, (ii) $Y - X$, (iii) $X \cap Y$.

4. a) Show that $(A \cap B)^c = A^c \cup B^c$.

b) Which of the following sets are equal ?

$$A = \{x : x^2 - 4x + 3 = 0\}, B = \{x : x \in \mathbb{N}, x < 3\}, C = \{x : x \in \mathbb{N}, x \text{ is odd} < 5\}$$

5. a) Show that $(A \cup B) - (A \cap B) = (A - B) \cup (B - A)$.

b) Determine which of the following statement is true or false.

i) $A \cup P(A) = A$

ii) $A - P(A) = A$

iii) $A \cap P(A) = A$

iv) $\{A\} \cap P(A) = A$

SECTION-C

6. a) Show that $\sim(p \vee q)$ and $\sim p \wedge \sim q$ are equivalent.

b) Use truth table to prove $\sim(p \vee q) \equiv (\sim p \wedge \sim q)$.

7. a) Show that $(p \wedge q) \rightarrow r$ and $(p \rightarrow r) \wedge (q \rightarrow r)$ are not equivalent.

b) Determine whether $(\sim q \wedge (p \rightarrow q)) \rightarrow \sim p$ is a tautology.

8. a) If $A = \begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$ and $B = \begin{bmatrix} 9 & 1 \\ 7 & 8 \end{bmatrix}$, find matrix C such that $3A + 5B + 2C$ is null matrix.

b) Show that matrix addition is commutative *i.e.* $A + B = B + A$, where A and B and $m \times n$ matrices.

9. a) Find value of x such that $\begin{bmatrix} 1 & x & 1 \end{bmatrix} \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix} = 0$.

b) Show that if $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$, and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, find k so that $A^2 = 8A + kI$.

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Total No. of Pages : 02

Total No. of Questions : 09

MCA (2015 to 2018) (Sem.-1)
ACCOUNTING & FINANCIAL MANAGEMENT
Subject Code : MCA-104
M.Code : 72710

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students have to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

1. What is an Accounting? Explain its Principles, Concepts and conventions of Accounting. Write a brief note on double entry system of an Accounting.
2. Redraft the incorrect trial balance :

Name of Account	Debit	Credit
Capital		30,000
Furniture		3000
Deposit with bank	22,500	
Interest Received	1,125	
Miscellaneous Receipts	2,250	
Sundry Creditors		3,750
Sundry Debtors	10,500	
Discount Allowed		750
Discount Received	600	
Purchases	90,000	
Sales		1,20,000
Return inwards	1,500	
Return outwards		2,250
Carriage inwards	2,250	
Carriage outwards		1,500
Salaries	4,500	
Wages	3,000	
Miscellaneous Exp		3,000
Cash in hand	375	
Opening stock	17,100	
Closing stock	8,550	
	1,64,250	1,64,250

SECTION-B

3. Bring out the difference between cash flow statement and a fund flow statement.
4. What is financial Management? Discuss in Brief scope, nature, role and advantages of financial management.

SECTION-C

5. What is Marginal costing? Discuss its nature, scope and importance.
6. What are standard costing? Explain the nature, importance and variances of standard costing.

SECTION-D

7. Discuss the advantages of computerised Accounting.
8. What are the sub modules of computerised accounting system?

SECTION-E

9. Write short note on :

- a) What is ratio analysis?
- b) Budgetary Control
- c) Profit and loss A/C
- d) What is operating activities?
- e) Features of trial balance
- f) Define Capital Expenditure. Given examples.
- g) Difference between Fixed assets and current assets.
- h) Money measurement concept
- i) Sole proprietary concern
- j) Computer program for accounting

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Nov-2019

Roll No. _____

Total No. of Pages : 03

Total No. of Questions : 19

MCA (2014 Batch) (Sem.-1)
ACCOUNTING & FINANCIAL MANAGEMENT

Subject Code : MCA-104

W.Code : 26045

Time : 3 Hrs.

Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TWENTY marks and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

1. Explain in brief sole Proprietary concern and partnership with example.
2. From the following balances, prepare the profit and loss account and balance sheet of IS Traders as on 31, 2013.

Particular	Debit Balance	Particular	Credit Balance
Drawings	6,300	Capital	1,55,000
Cash at Bank	14,000	Discount Received	3,150
Bills Receivables	1,900	Loans	10,000
Land & Building	42,600	Purchase Return	2,500
Furniture	5,140	Sales	2,90,000
Discount Allowed	4,000	Reserve for Bad debts	5,650
Bank charges	200	Creditors	18,670
Salaries	6,520		
Purchases	2,05,000		
Stock Opening	60,000		
Sales Return	1,910		
Carriage	5,190		
Rent & Taxes	7,750		
General Expenses	3,610		
Plant & Machinery	31,700		
Book debts	82,480		
Bad debts	1,460		
Insurance	4,850		
	4,84,970		4,84,970

Closing Stock is Rs. 70,000

SECTION-B

3. Define Financial Statement. Describe in brief various functional areas of financial Management.
4. Given below in the Balance sheet of a limited company as on 31st March 2007.

Balance Sheet			
Liability	Amt	Assets	Amt
30,000 Equity shares of Rs. 100 each fully paid	30,00,000	Goodwill at Cost	10,00,000
15,000, 6% pref. Shares of Rs. 100 each fully Paid	15,00,000	Land & Building	43,00,000
Reserve fund	15,00,000	Plant & Machinery	40,00,000
Dividend equilation fund	5,00,000	Stock in Trade	20,00,000
5% Debentures	40,00,000	Sundry Debtors	15,00,000
Current Liabilities	10,00,000	Cash at Bank	3,50,000
		Accured Income	1,50,000
	1,15,00,000		1,15,00,000

Find out :

- a) Debt. Equity Ratio
- b) Solvency Ratio
- c) Currents Assets to Net worth Ratio
- d) Proprietary Ratio
- e) Fixed Assets to net worth ratio
- f) Total Assets to debt Ratio

SECTION-C

5. What is Costing? Explain its Characteristics and types of Relevant Costs and what Cost are considered for decision-Making?
6. Define Standard Costing. Discuss its advantages, and applications.

Nov-2019

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(IT)/MCA/PGDCA (2019 Batch) (Sem.-1)

TECHNICAL COMMUNICATION

Subject Code : PGCA-1905

M.Code : 76975

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Answer the following :

- a. What is an extempore?
- b. Define an E-mail.
- c. Write two barriers to effective communication.
- d. Define Technical Writing.
- e. What is research paper?
- f. What are Memos?
- g. What is dissertation?
- h. Explain the difference between reference and bibliography.
- i. Define Instruction Manuals.
- j. What is Adobe frame maker?

SECTION-B

2. Define Communication. Explain Weaver's model of communication.
3. What is a non-verbal communication? Explain with the help of an example. Discuss the different barriers of communication.
4. Explain the essential and important parameters of paragraph writing. Explain descriptive and imaginative paragraph writing with suitable examples.
5. Write a paragraph using imaginative writing skills. Explain the importance of precise writing, reading and comprehension.

SECTION-C

6. Write the **(atleast two)** difference between the following:
 - a. Circular and notices
 - b. Resume writing and technical proposals
7. Write a technical proposal to government of India for new business set up. (Create index, references and bibliography).
8. How presentation techniques are useful in verbal communication? Explain in context of extempore and conferences.
9. What is verbal communication? Write the significance of verbal communication in technical communication. How it is useful for meetings? Justify your answer with suitable example.

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Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(IT)/MCA/PGDCA(2019 Batch) (Sem.-1)
RELATIONAL DATABASE MANAGEMENT SYSTEMS
Subject Code : PGCA-1904
M.Code : 76974

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

Q1. Answer briefly :

- a) List some popular RDBMS Packages.
- b) Use COUNT aggregate function.
- c) Explain Domain integrity.
- d) Explain the role of DBA in database.
- e) What is the other name of Equi Join and where it is used?
- f) Syntax for Embedded SQL.
- g) Functional Dependency.
- h) Database Schema.
- i) SQL Example of UPDATE command.
- j) Use of GRANT and REVOKE commands.

SECTION-B

- Q2. Explain the Architecture of DBMS with diagram shows different levels of abstraction in detail.
- Q3. Differentiate between function and procedure using suitable examples.
- Q4. Explain different types of Triggers and write a trigger for salary update.
- Q5. What do you understand by authorization, how it's used on different users? Elaborate.

SECTION-C

- Q6. Explain an ER model with suitable example.
- Q7. What is Normalization, define and explain first, second and third normal form?
- Q8. What are the different concurrency problems discuss in detail?
- Q9. What are the different Security issues in database?

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(IT)/MCA/PGDCA (2019 Batch) (Sem.-1)

OPERATION SYSTEM

Subject Code : PGCA-1903

M.Code : 76973

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

Q1. Explain the following :

- a) PCB
- b) LRU
- c) Paging
- d) DMA
- e) Trashing
- f) Scheduling
- g) System call
- h) Throughput
- i) Deadlock
- j) Fragmentation

SECTION-B

- Q2. Define Operating Systems and its types.
- Q3. Find waiting and turnaround time for the given processes using FCFS and SCF algorithms.

Process	Arrival Time (ms)	Burst Time (ms)
P1	1	5
P2	2	4
P3	2	7
P4	3	2

- Q4. Differentiate between preemptive and non-preemptive scheduling.
- Q5. What is round robin scheduling? Explain it with help of an example.

SECTION-C

- Q6. Discuss basic memory management techniques and their advantages and dis-advantages.
- Q7. Differentiate between LRU and optimal replacement algorithms with help of example.
- Q8. What is a page fault? Also describe locality of reference.
- Q9. Explain various levels of RAID structure.

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Nov-2019

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

M.Sc.(IT)/MCA/PGDCA (2019 Batch) (Sem.-1)
**FUNDAMENTALS OF COMPUTER AND PROGRAMMING IN
PYTHON**

Subject Code : PGCA-1902

M.Code : 76972

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying TEN marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

Q1. Explain the following :

- a) Hardware
- b) Port
- c) OCR
- d) Plotter
- e) Cache
- f) IoT
- g) Indentation
- h) Loops
- i) Scope
- j) Module

SECTION-B

- Q2. What are various functional units of Computer? Explain.
- Q3. Convert to binary
- 467_8 63819_{10} 12345_{10} $ABCD_{16}$ $FE963_{16}$
- Q4. What is an operating system? Why it is termed as resource allocator?
- Q5. What are various data types in Python? How the type conversion is done?

SECTION-C

- Q6. Differentiate between built-in and user defined function.
- Q7. Write a note on module reloading and standard modules.
- Q8. How exceptions are defined in Python?
- Q9. Explain the concept of OOPS in Python.

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Nov-2019

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

MCA (2015 to 2018) (Sem.-1)
OBJECT ORIENTED PROGRAMMING IN C++
Subject Code : MCA-102
M.Code : 72708

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTIONS-A, B, C & D contains TWO questions each carrying TEN marks each and students has to attempt any ONE question from each SECTION.
2. SECTION-E is COMPULSORY consisting of TEN questions carrying TWENTY marks in all.

SECTION-A

1. Discuss any five characteristics of Object Oriented Programming.
2. a) Describe the working of breaking control statement.
b) Explain various operators available in C++.

SECTION-B

3. a) What is recursion? Explain by taking example.
b) Explain the working of Union.
4. Write a program for demonstrating functions and arrays.

SECTION-C

5. a) Describe the concept of dynamic memory allocation by taking an example.
b) What are nested classes? Discuss the use of nested classes in OOP.
6. What is meant by multiple-Inheritance? Write a code snippet in C++ demonstrating multiple-inheritance.

SECTION-D

7. What is meant by operator overloading? Why is it required in OOP? Explain.
8.
 - a) Define Virtual Function.
 - b) Discuss file handling using IO streams.

SECTION-E

9. **Write briefly :**
 - a) Comment on iostream.h
 - b) Define the term abstraction.
 - c) What is meant by data hiding?
 - d) Define the term enumeration.
 - e) What are destructors?
 - f) Discuss briefly about late binding.
 - g) What is single inheritance?
 - h) What is the use of keyword "Throw"?
 - i) "*Can constructor be overloaded*"? Comment.
 - j) What is the use of keyword "*Static*"?

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