Code No. 1711

FACULTY OF SCIENCE

M.C.A. I – SEMESTER REGULAR EXAMINATIONS, MAY- 2022

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

PAPER – 1

Time: 3 Hours] [Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A (5x4=20)

Answer the following questions in not more than **ONE** page each:

1. Explain basic connectives and truth tables.
2. Write about partial orders.
3. What are partitions of Integers? Explain.
4. What is Monoid? Explain.
5. Explain Hamiltonian paths and cycles.

Section – B (5x10=50)

Answer the following questions in not more than **FOUR** pages each:

6. a) Explain the Laws of Logic with example. Simplify the following compound statement $\neg[\ \neg\ [\ (\ p \vee q\ ) \wedge r\ ] \vee \neg q]$.

(OR)

b) What is Set? Explain set operations and Laws of Set theory with example.

7. a) i. Explain Principle of Inclusion and Exclusion with example.
ii. Find number of integers between 1 and 10,000 inclusive, which are divisible by none of 5,6 or 8.

(OR)

b) What is Function? Explain one-to-one, onto and inverse functions with examples.

8. a) i. What is Generating Function? Explain with example.
ii. How many integer solutions are there for the equation $c_1+c_2+c_3+c_4=25$ if $0<=c_i$ for all $1<=i<=4$?

(OR)

b) i. What is Recurrence relation? Explain.
ii. Solve the recurrence relation $a_n=5a_{n-1}+6a_{n-2}$, $n>=2$, $a_0=1$ and $a_1=3$.

9. a) What is Algebraic System? Explain its properties by taking $< Z, +, . >$

(OR)

b) What is Group? Show that in a Group $<G, *>$, if for any $a,b \in G$, $(a * b)^2 = a^2 * b^2$, then $<G,*>$ must be abelian.

10. a) What is Isomorphism? Explain Isomorphic and nonIsomorphic Graphs.

(OR)

b) What is Tree? Explain methods of constructing minimum spanning tree.

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Code No.1713

FACULTY OF SCIENCES

MCA I – SEMESTER REGULAR EXAMINATIONS, MAY- 2022

OBJECT ORIENTED PROGRAMMING USING JAVA

PAPER – III

Time: 3 hours] [Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A

Answer the following questions in not more than **ONE** page each: (5x4=20)

1. Explain the Compilation process of a Java Program.
2. Write a short note on Byte Streams.
3. Write short note on BitSet class.
4. Explain Delegation Event Model.
5. Write a short note on Serialization.

Section – B

Answer the following questions in not more than **FOUR** page each: (5x10=50)

6. a) Explain Object Oriented Concepts. And write the benefits of it.

(OR)

b) Describe the Data Types used in Java. Write a sample program to explain these types.

7. a) Define an Exception. Explain the key words try, catch, throw, throws and finally with example exception handling programs.

(OR)

b) Differentiate between Multi processing and Multi threading. Explain thread creation by implementing Runnable interface.

8. a) What is Comparator? Demonstrate the use of Comparator with an example program.

(OR)

b) What is StringTokenizer Class? Write the constructors of it. Write a program to create a StringTokenizer.

9. a) Write a Java program to handle Mouse Events.

(OR)

b) Write the types of controls that AWT supports. Write a program to demonstrate Buttons and Check Boxes.

10. a) Describe Java I/O Classes and Interfaces.

(OR)

b) Write a Java program to copy the contents of source file to destination file.

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Code No.1712

FACULTY OF SCIENCES

MCA I – SEMESTER REGULAR EXAMINATIONS, MAY- 2022

DATA STRUCTURES USING 'C'

PAPER – II

Time: 3 hours] [Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A

Answer the following questions in not more than **ONE** page each: (5x4=20)

1. Explain decision making statements.
2. Explain storage classes.
3. Write about Data Structure.
4. Why we have to balance the height of tree? Explain.
5. Compare static memory versus dynamic memory allocation.

Section – B

Answer the following questions in not more than **FOUR** page each: (5x10=50)

6. a) What are the various operators used in expression evaluation? Explain with precedence and associativity.

(OR)

b) Explain different searching methods with program. Compare both.

7. a) What is Function? Explain different parameter passing mechanisms.

(OR)

b) What is Structure? How to pass structure as parameter to function? Explain.

8. a) Explain various operations performed on stacks. Write applications of stack.

(OR)

b) Explain Abstract Data Type of Doubly Linked List.

9. a) Explain implementation of Binary Search Tree operations.

(OR)

b) What is Graph? Explain various methods of implementing of Graph.

10. a) What is Hashing? Explain Collision resolution techniques.

(OR)

b) Explain Merge Sort with Implementation. Which sorting algorithm is best? Give reasons.

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Code No. 1714

FACULTY OF SCIENCE

M.C.A. I – SEMESTER REGULAR EXAMINATIONS, MAY-2022

COMPUTER ARCHITECTURE

PAPER – IV

Time: 3 Hours] [Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A (5x4=20)

Answer the following questions in not more than **ONE** page each:

1. Explain about Complements
2. Explain the instruction cycle with neat flow chart.
3. Write pop operations.
4. What is Main Memory?
5. Write short notes on Arithmetic Pipeline.

Section – B (5x10=50)

Answer the following questions in not more than **FOUR** pages each:

6. a) Describe how the fixed – Point numbers are represented.

(OR)

b) Explain about Bus Structure and Data Transfer.

7. a) Explain in detail about Bus and Memory Transfer.

(OR)

b) Discuss about Memory Reference Instructions.

8. a) Write in detail about various addressing modes.

(OR)

b) What is Division Algorithm? Explain with an example and draw neat flow chart for division operation.

9. a) Discuss different mapping techniques used in Cache memories and their relative merits and demerits.

(OR)

b) Explain Numerical Example in the memory management hardware.

10. a) Explain about RISC Pipeline.

(OR)

b) Distinguish between a Synchronous and a Asynchronous data Transfer Mechanisms.

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Code No. 1715

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M. C. A. I – SEMESTER REGULAR EXAMINATIONS, MAY- 2022

PROBABILITY AND STATISTICS

PAPER – V

Time: 3 Hours] [Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A (5x4=20)

Answer the following questions in not more than **ONE** page each:

1. What are Vector spaces and Sub spaces?
2. Describe the Probability Rules.
3. What is Random sampling? Explain.
4. Write the procedure for Testing Hypothesis.
5. Obtain the Regression equations from the following information.
   $\sum X=24, \sum Y=44, \sum XY=306, \sum X^2=164, \sum Y^2=574, N=4$

Section – B (5x10=50)

Answer the following questions in not more than **FOUR** pages each:

6. a) Describe Linear Transformations in detail.

(OR)

b) What are Linearly Independent Sets? Illustrate with examples.

7. a) Explain Bayes' theorem in detail.

(OR)

b) Derive formulae for Median and Mode of Normal Distribution.

8. a) Samples of size 2 are taken from the population4,8,12,16,20,24 with replacement. Find
   i. The mean & standard deviation of the population
   ii. The mean & standard deviation of the sampling distribution of means

(OR)

b) Explain Briefly
   i. Point Estimation ii. Interval Estimation

9. a) Describe the Hypotheses testing of means when population standard deviation is not known.

(OR)

b) Explain the Test Procedure for Large sample test concerning difference between two means.

10. a) Describe Chi-Square as test of Independence with an example.

(OR)

b) Regression equations of two variables X and Y are as follows. 3X+2Y-26=0, 6X+Y-31=0. Find (i) Mean, (ii) The Regression Coefficients (iii) The Coefficients of Correlation between X and Y.

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Code No. 1716

FACULTY OF SCIENCE

M. C. A. I – SEMESTER REGULAR EXAMINATIONS, MAY- 2022

MANAGERIAL ECONOMICS AND ACCOUNTANCY

PAPER – VI

Time: 3 Hours] [Max. Marks: 70

Note: Answer all questions from Section – A and Section – B

Section – A (5x4=20)

Answer the following questions in not more than **ONE** page each:

1. Risk and Uncertainty
2. Law of Demand
3. Production Function
4. Capital budgeting
5. Double entry system of book keeping

Section – B (5x10=50)

Answer the following questions in not more than **FOUR** pages each:

6. a) Define the term 'Managerial Economics' and explain its usefulness to Engineers.

(OR)

b) Explain about:

i. Opportunity costs ii. Marginalism

7. a) What is Elasticity of Demand? Explain about Price Elasticity of Demand.

(OR)

b) What is Demand Forecasting? Explain any two methods of Demand Forecasting.

8 a) Define the term 'Economics of Scale' and explain internal and external Economics of Scale.

(OR)

b) What is Break-Even Analysis? Calculate Break-even point and Break-even sales from the following information:
Fixed cost is Rs.2,00,000, Selling price per unit is Rs.25 and Variable cost per unit is Rs.15.

9. a) Define the term 'Capital' and explain sources of capital.

(OR)

b) Calculate Pay Back Period and Net Present Value method for the following information related to a project proposal:

	Amount in Rs.	Present Value at 10 %
Cash Outflow	2,00,000	1.00
Cash Inflow-Year 1	60,000	0.909
Year 2	75,000	0.826
Year 3	50,000	0.751
Year 4	40,000	0.683
Year 5	60,000	0.621

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10.a) Explain in what way ratios are useful in analysis and interpretation of Financial Statements.

(OR)

b) Prepare final accounts from the following information:

Adjustments:

i. Closing Stock is Rs.2,000
ii. Outstanding Salaries are Rs.200
iii. Depreciation on Vehicle is 5%.

Particulars	Dr. (Rs)	Cr. (Rs)
Capital		7,670
Cash in hand		30
Purchases	8,990	
Sales		11,060
Cash at bank	885	
Fixtures and Fittings	225	
Vehicle	1,500	
Lighting and heating	65	
Bills Received		825
Returned inward		30
Salaries	1,075	
Creditors		1,890
Debtors	5,700	
Stock	3,000	
Printing	225	
Bills payable	1,875	
Rates, Taxes & insurance	190	
Discounts Received	445	
Discounts allowed		200
	24,175	21,705

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