

International Institute of Professional Studies
End Semester Exam. Jan.-May 2024
M.C.A. (5 Years) -IV Semester
Programming with Java

IC- 403D

Time : 3 Hours

Max. Marks. 60

Section 'A'

Attempt any 3 questions.

- Q1 a) What is an abstract class? (2)
b) What is the difference between static and non static variables? (2)
c) What do you mean by command line parameters? (2)
d) Explain the various uses of keyword 'final'. (4)
- Q2 a) What is an interface in Java? How does it differ from a class? (5)
b) What are packages? Provide an example of how to create and use a package in a Java program. (5)
- Q3 a) What is Exception in Java? How can you create custom exceptions to handle specific errors in your application logic?(Give Sample Code Also.) (5)
b) How Event Handling works in Java? Explain Adapter classes and why they required in Java? (5)
- Q4 a) Explain following layout managers with appropriate example: **FlowLayout**, **BorderLayout**, and **GridLayout**. (5)
b) What is Object Serialization and Deserialization? How can you read and write objects to a file in Java (Give Complete Example)? (5)

Section 'B'

Attempt any 3 questions.

- Q5 Write java code for creating a JFrame. Your frame has two JButton's. one for **Ok** and other for **Cancel**. If you click **ok** button then it shows a message box (**showMessageDialog** method of **JOptionPane**) with message "You Clicked Ok Button" and if user clicked **cancel** button then it shows a message box with message "You Clicked Cancel Button". Write a main method also to show this JFrame's object. (10)
- Q6 Write a program for producer consumer problem (with synchronization). (10)
- Q7 Write a program to search a number in unsorted array in Multi threaded. Lets array element's size is 100 element and there are four threads, each thread searching in its 25 elements. As the one thread finds the number, all other thread must stops its working and programs show proper message. (10)
- Q8 There is a table in Access Database called StudMast(Stu_Id int , Stu_Name varchar(50)). Write a JDBC program to insert a row in to this table. You should read Stu_Id and Stu_Name value from user and then store this in database. JDBC driver class name is "sun.jdbc.odbc.JdbcOdbcDriver" and DSN is MyDataBase. (10)

International Institute of Professional Studies, DAVV
End-Semester Exam, January - April, 2024
MCA (5Yrs.) IV Semester
Discrete Mathematics

[Max. Marks: 60]

[Time: 3 Hrs.]

Note: Attempt any five questions; each question carry equal mark. Solve all parts of the question at the same place.

Q1) (a) Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, and the ordering of elements of U has the elements in increasing order; that is, $a_i = i$. What bit strings represent the subset of all odd integers in U , the subset of all even integers in U , and the subset of integers not exceeding 5 in U ? 6

(b) Define following with example: 6

(i) Set Operations

(ii) n-ary relation

(iii) Composition of relations

Q2) (a) Out of total of 130 students, 60 are wearing hats to class, 51 are wearing scarves and 30 are wearing both hats and scarves. Of the 54 students who are wearing sweaters, 26 are wearing hats, 21 are wearing scarves and 12 are wearing both hats and scarves. Every one wearing neither a hat nor a scarf is wearing gloves. 6

(i) How many students are wearing gloves?

(ii) How many students not wearing a sweater are wearing hats but not scarves?

How many students not wearing a sweater are wearing neither a hat nor a scarf?

(b) Let R be the a relation in the set $N \times N$, where N is a set of Positive integers defined by $(a, b) R (c, d) \iff a + d = b + c$ 6
 $a, b, c, d \in N$, then prove that R is Reflexive? Symmetric? Transitive? An equivalence relation or not?

Q3) (a) Simplify the following Boolean expression: 6

(i) $A(A + B) + (B + AA)(A + B)$

(ii) $AB(A + B)(B + B)$

(b) Consider the following problem. A system used 3 switches A , B and C ; a combination of switches determines whether an alarm, X , sounds: If switch A or switch B are in the ON position and if switch C is in the OFF position then a signal to sound an alarm, X is produced. It is possible to convert this problem into a logic statement or gates. Also explain it to the truth table. 6

Q4) (a) What is Lattice? Define the types of lattice with ub, lb, lub, and glb. 6

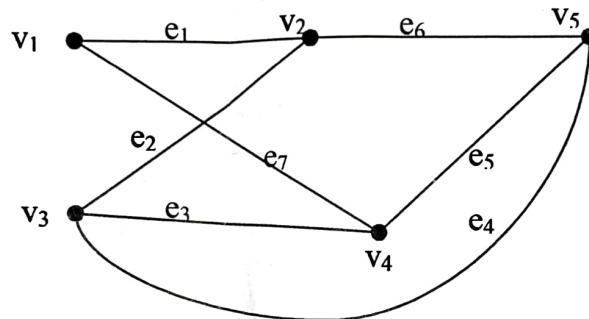
✓ (b) Show that whether or not the following prepositions are logically equivalent through truth values. 6

- (i) $(p \rightarrow r) \wedge (q \rightarrow r)$ and $(p \vee q) \rightarrow r$
 (ii) $p \leftrightarrow q$ and $(p \rightarrow q) \wedge (q \rightarrow p)$

Q5) (a) A relation R on the set $A = \{a, b, c, d, e\}$ is defined as follows: 6
 $R = \{(a, a), (a, b), (b, a), (b, b), (c, c), (c, d), (c, e), (d, c), (d, d), (d, e), (e, c), (e, d), (e, e)\}$. Determine the equivalence classes of R and partitions.

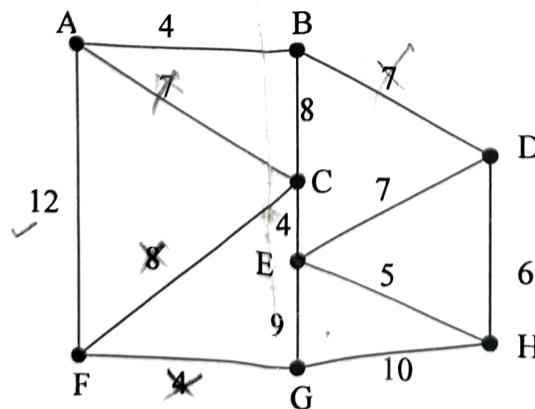
(b) Draw the Hasse Diagram of D60 and D75 (divisor of 60 and 75). 6

Q6) (a) If a Graph G (V, E) is defined by- 6
 $V = \{v_1, v_2, v_3, v_4, v_5\}$, $E = \{(v_1, v_2), (v_1, v_4), (v_2, v_3), (v_2, v_5), (v_4, v_5), (v_3, v_5), (v_3, v_4)\}$ $|V| = 5$, $|E| = 7$, then find the adjacency matrix and incidence matrix of the graph G.



✓ (b) Define following with Example: 6
 (i) Eulerian and Hamiltonian graph
 (ii) Eccentricity and Distance
 (iii) Complete Bipartite Graph

Q7) ✓ Apply prim's algorithm, find two distinct minimal spanning trees of the following labeled graph G 12



International Institute of Professional Studies
Devi Ahilya University, Indore
M.C.A. (5 Years) - IV Semester Sec. 'B'
1st Internal Test Session Jan.-May.2024
Programming with Java

Time : 1 Hours

Max. Marks. 20

Note: Attempt any 2 questions.

- Q.1 (a) How inheritance is performed in Java. Explain the use of super keyword with example. (5)
(b) How command line arguments are passed in java program. Write a java program for calculator, which receive input from command line and show the result.
Say: Cal 2 + 5
Its show the result of + operation as answer. In general, the syntax is Cal Operand1 Operator Operand2. Here operator are +, -, *, /. (5)
- Q.2 (a) Write a Java program to perform the following functions on a matrix. Program should create class with functions for matrix **multiplications** and **printMatrix**. After that create a class with main function which declare variable for Matrix class and call the method for read matrix, multiply it and show the matrix. (5)
(b) Explain the various uses of keyword '**final**' and '**finalize**'. (5)
- Q.3 (a) How static method and static variable are different from instance method and variable. Show uses with example code snippets. (5)
(b) What is variable length argument list in function? When ambiguity in parameter is created in it. Explain with example. (5)

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International Institute of Professional Studies
Internal Test -I, MCA (5Yrs.) IV Semester, B Section
Discrete Mathematics

1. In a class of 80 students, 50 students know English, 55 know French and 46 know German language. 37 students know English and French, 28 students know French and German, 7 students know none of the languages. Find out

- (a) How many students know all the 3 languages?
- (b) How many students know exactly 2 languages?
- (c) How many know only one language?

⁸
25 Students know
English & German

2. Show that whether or not the relation R on $Z \times Z$ defined by
(a, b) R (c, d) if and only if $a + d = b + c$ is an equivalence relation.

4

3. Define following with suitable example:
(i) Mathematical Induction (ii) Inverse Relation

4

4. A relation R on the set $A = \{a, b, c, d, e\}$ is defined as follows:

4

$R = \{(a, a), (a, b), (b, a), (b, b), (c, c), (c, d), (c, e), (d, c), (d, d), (d, e), (e, c), (e, d), (e, e)\}$.
Determine the equivalence classes of R and partitions.

International Institute of Professional Studies
End-Semester Exam Jan - May 2024
MCA (5 years) IVth Semester
Data and Computer Communication

Max Marks-60

Time-3 Hrs

Note: Attempt any five Questions. Attempt all the sub-questions of each question altogether at one place..

- Q1a) Define data Communications .Explain two type of transmission technologies available. (06)
- b) Explain the following: (06)
- i. Analog and digital data
 - ii. Bandwidth
 - iii. Bit Rate
 - iv. Guided media
 - v. Composite Signals
 - vi. periodic and Non-perioiodic signals
- Q2.a) Define Network topology.Give two advantages and two disadvantages for any four types of network topology. (06)
- b) What is Time Division Multiplexing? What is the disadvantage of Synchronous TDM and how it is overcome? (06)
- Q3a) Explain Pulse Code Modulation. What should be the sampling rate according to the Nyquist theorem? (06)
- b) Encode the data stream having three 0s followed by two 1s followed by two 0s and another three 1s using following encoding schemes. (06)
- i) Polar NRZ-L ii) RZ iii) NRZ-I iv) Manchester v) AMI
- Q4a) What is Digital-Analog Modulation. Explain any two types of Digital-Analog Modulation Techniques (06)
- b) What is CRC. Given the message $M(X) = X^5 + X^4 + X + 1$ and the generator $G(X) = X^4 + X^3 + 1$. Compute the CRC code. (06)
- Q5a) What is framing? Explain the Bit stuffing method of framing.If the bit string 011110111110111110 is to be bit stuffed and start and end of frame is 01111110,What is the output string? (06)
- b) How do guided media differ from unguided media? Why wires are twisted in case of twisted pair of transmission medium? (06)
- Q6a) What is Stop-and-Wait ARQ protocol with all the 3 scenarios. (06)
- b) i). Consider the following bit stream that is to be encoded using VRC and LRC with even parity. What will be the transmitted data? (06)
- 1100001 1111001 1011001 0000101
- ii). Compute the checksum for the following datawords.
- 10110011 10101011 01011010 11010101
- Q7a) What is CSMA/CD ?Explain its working. (06)
- b) Compare IEEE 802.3,802.4 and 802.5 Standards. (06)

***** All The Best *****

Roll No. **IC-2K22-99**

IC-405A

International Institute of Professional Studies, DAVV, Indore

End-Semester Exam Apr.-May-2024

MCA (5 Yrs.) IVth Semester

UNIX Operating System

Max. Marks: 60

Time: 3 Hrs

Instruction: - All questions carry equal marks. Attempt any Five (5) questions. All the sub-parts of the question should be answered together.

- Q. 1)**
- a) What is an UNIX operating system? Explain architecture of UNIX operating system? (6)
 - b) What is file system? Discuss any two kinds of file system with suitable assumption? (6)
- Q. 2)**
- a) What are the different modes of setting file permissions? Explain with suitable example? (6)
 - b) What is a filter? Discuss any two filters with suitable example? (6)
- Q. 3)**
- a) What is the mechanism of process creation in UNIX? How does UNIX manage the processes explain with suitable assumption? (6)
 - b) Explain shell wild-card (or matacharacter) with suitable example? (6)
- Q. 4) Write short notes on:**
- a) pipe (|) (3)
 - b) head (3)
 - c) chmod (3)
 - d) read (3)
- Q. 5) Define and explain the following given commands with minimum three specific options:**
- a) ps (4)
 - b) grep (4)
 - c) ls (4)
- Q. 6) Define and explain the following given decision making commands with suitable example:**
- a) case (4)
 - b) if (4)
 - c) while (4)
- Q. 7) How the vi Editor are work in UNIX systems? Discuss in detail the three modes supported by UNIX shell explain with suitable command options? (12)**

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International Institute of Professional Studies, DAVV, Indore

Internal Test – I, MCA (5 Yrs.) IV Semester, Section – “B”

IC-405A (UNIX Operating System)

Time: 1 Hrs.

Max Marks: 20

Instruction: -Write precise answers, do not use pencil only use blue or black ball point pen.

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|-------|--|-------|
| Q. 1. | What is the file system ? Discuss any two kinds of file system in brief ? | (2+2) |
| Q. 2. | What do you mean by utilities ? Discuss any four kinds of general purpose utilities in brief ? | (2+4) |
| Q. 3. | What is an UNIX operating system? Explain features of the UNIX OS ? | (4+6) |

International Institute of Professional Studies
Devi Ahilya University
End Semester Examination April-May-2024
MCA (5Yrs.) Semester IV (Section A and B)
Entrepreneurship

[Max.Marks: 60]

[Time: 3 hours]

Note: Attempt any five (05) questions. Each question carries equal marks (5×12).

Q. 1 "A person who starts a business and is willing to risk loss in order to make money." Discuss. Explain in detail various functions of entrepreneur.

Q. 2 What is creativity and innovation? Explain in detail step by step process of creativity with the help of example.

Q. 3 What do you understand by organisation structure? Discuss in detail Top, Middle and Lower level role and responsibilities in details.

Q. 4 "Business Plan is a blueprint of the step by step procedure that would be followed in order to convert a business idea in to a successful business venture". Discuss the statement.

Q. 5 What are the various types of Human Resource issues faced by an organisation.

Q. 6 Describe the concept and role of marketing for setting new venture. What are the various issues related to promotion and pricing.

Q. 7 Write in brief success story of any leader with reason for success.
