**R8411**

**Sub. Code**
**541201**

**M.C.A. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Computer Applications**

**DESIGN AND ANALYSIS OF ALGORITHMS**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** $(10 \times 1 = 10)$

Answer **all** questions.

1. In algorithm visualization of bubble sort algorithm the non-linear curve of the sorted elements is close to ————

(a) 3n (b) $n^3$
(c) 2n (d) $n^2$

2. The recursive versions of binary search use a ———— structure.

(a) Branch and bound
(b) Dynamic programming
(c) Divide and conquer
(d) Simple recursive

3. ———— are node-based data structures used in many system programming applications for managing dynamic sets.

(a) Stack
(b) Queue
(c) Binary search trees
(d) List

4. Which method is practical to perform a single search in an unsorted list of elements?

(a) Sequential search

(b) Bubble sort

(c) Horspool's method of string-matching

(d) Brute force method of string matching

5. Which algorithm finds the solution for the single-source shortest path problem for a tree?

(a) Prim's (b) Dijkstra's

(c) Kruskal's (d) Huffman code

6. Prim's algorithm starts constructing a minimum spanning tree from ————

(a) An arbitrary root vertex

(b) The shortest arc

(c) The left most vertex

(d) The right most vertex

7. The basic operation of the ———— algorithm is the comparison between the element and the array given.

(a) Binary search (b) Greedy

(c) Brute force (d) Insertion sort

8. ———— is not a balanced search tree.

(a) AVL tree (b) Binary tree

(c) Red-black tree (d) B-tree

9. ———— is an optimization technique for particular classes of backtracking algorithms that repeatedly solve sub-problems.

(a) Decrease and conquer

(b) Dynamic programming

(c) Branch and bound

(d) Divide and Conquer

10. ———— is a sequence of data elements connected to each other where every element has a link field referring to the location of the next element.

(a) Array (b) Stack

(c) List (d) Queue

**Part B** ($5 \times 5 = 25$)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the general framework for analyzing the efficiency of an algorithm.

Or

(b) Explain in detail about asymptotic notation and its properties.

12. (a) Explain in detail about Brute force approach.

Or

(b) Discuss about the time complexity of binary search.

13. (a) Compare Greedy method and Dynamic Programming.

Or

(b) Explain Dijkstra's algorithm in detail.

14. (a) What is Pseudocode? Explain with an example?

Or

(b) Explain the steps involved in Problem solving.

15. (a) Define Backtracking. State the principle of Backtracking.

Or

(b) Explain subset-sum problem and discuss the possible solution strategies using back tracking.

**Part C** $(5 \times 8 = 40)$

Answer any **five** questions.

16. Explain the method of solving recurrence equation with suitable example.

17. Explain in detail about merge sort with an example.

18. Discuss about the fundamentals of the analysis of algorithm efficiency elaborately.

19. Explain in detail about Travelling Salesman problem using exhaustive search.

20. Trace the algorithm for the following set of numbers 20, 35, 18, 8, 14, 41, 3, 39.

21. Describe the steps in analysing and coding an algorithm.

22. Explain some of the problem types used in the design of algorithm.

23. Discuss the fundamentals of analysis framework.

| R8412 | Sub. Code |
|---|---|
| | 541202 |

**M.C.A. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Computer Applications**

**ADVANCED JAVA PROGRAMMING**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** $(10 \times 1 = 10)$

Answer **all** questions.

1. Which environment variable is used to set the java path?

   (a) MAVEN_Path (b) JavaPATH

   (c) JAVA (d) JAVA_HOME

2. Which of the following is a type of polymorphism in Java Programming?

   (a) Multiple polymorphism

   (b) Compile time polymorphism

   (c) Multilevel polymorphism

   (d) Execution time polymorphism

3. Which of the following is a superclass of every class in Java?

   (a) ArrayList (b) Abstract class

   (c) Object class (d) String

4. Which one of the following is not an access modifier?

(a) Protected (b) Void

(c) Public (d) Private

5. Which one of the following contains date information?

(a) java.sql.TimeStamp

(b) java.sql.Time

(c) java.io.Time

(d) java.io.TimeStamp

6. In which of the following type of ResultSet, the cursor can only move forward in the result set?

(a) ResultSet.TYPE_FORWARD_ONLY

(b) ResultSet.TYPE._SCROLL_INSENSITIVE

(c) ResultSet.TYPE_SCROLL_SENSITIVE

(d) None of the above

7. Which of these class is used for creating a client for a server client operations?

(a) serverClientjava (b) Client.java

(c) AddClient.java (d) ServerClient.java

8. Which of these methods are member of Remote class?

(a) checkIP( ) (b) addLocation( )

(c) AddServer( ) (d) None of the above

9. Which of these operators can be used to get run time information about an object?

(a) getInfo (b) Info

(c) instanceof (d) getinfoof

10. For creating any applet _____ class must be inherited.

(a) java.applet.Appl

(b) java.applet.Applets

(c) java.applet.Applet

(d) java.Applet.awt

**Part B** $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Differentiate between C++ and JAVA.

Or

(b) Write short notes on for loop and while loop.

12. (a) How do you extend interface?

Or

(b) How do you create wrapper class?

13. (a) Write short notes on Connection class.

Or

(b) Write short notes on meta data function.

14. (a) Explain how datagrams implemented in a communication network.

Or

(b) Explain about TCP server sockets in java.

15. (a) Elaborate on combo box in JAVA.

Or

(b) How do you create table in an applet?

## Part C

$(5 \times 8 = 40)$

Answer any **five** questions.

16. Explain about expression and its evaluation.

17. Explain about package and its creation in JAVA.

18. Explain SQL exceptions in detail.

19. Explain about URL connection class and its methods in detail.

20. Describe the concept of AWT with the help of a program.

21. Write a java code for creating a simple client/server application using RMI.

22. Explain any four layout manger classes in detail.

23. Describe the design of JDBC and its programming concept.

———————

| R8413 | Sub. Code |
|---|---|
| | 541203 |

**M.C.A. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Computer Applications**

**ACCOUNTING AND FINANCIAL MANAGEMENT**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** $(10 \times 1 = 10)$

Answer **all** the questions.

1. True and fair profit and loss a/c of a company know by

   (a) Preparing trial balance

   (b) Preparing respective ledger of account

   (c) Preparing trading a/c

   (d) Preparing trading and profit and loss a/c

2. Financial information should he neutral and bias free" is the dictation of which one of the following?

   (a) Completeness concept

   (b) Faithful representation Concept

   (c) Objectivity Concept

   (d) Duality Concept

3. XYZ Co manufactures a single product G. Budgeted production output of G during June is 200 units. Each unit of product G requires 6 labour hours for completion, and XYZ Co anticipates 20 per cent idle time. Labour is paid at a rate of Rs. 7 per hour. The direct labour cost budget for June is

(a) Rs. 6,720 (b) Rs. 8,400

(c) Rs. 10,500 (d) Rs. 9,500

4. Operating costing is suitable for

(a) Job order business

(b) Contractors

(c) Sugar industries

(d) Service industries

5. Which of the following is a part of the Standard Costing process within an organisation?

(a) Comparison of standard and actual costing process

(b) Preparation and usage of the standard costing

(c) Analysis of variances

(d) All of the above

6. Analysis of overhead variances can be done by

(a) Two variance method

(b) Three variance method

(c) Four variance method

(d) All of the above

7. The concept of Financial management is

(a) Profit maximization

(b) All features of obtaining and using financial resources for company operations

(c) Organization of funds

(d) Effective Management of every company

8. A mutually exclusive project can be selected as per payback period when it is

(a) Less

(b) More

(c) More than 5 years

(d) None of the above

9. ———— is one that maximizes value of business. minimizes overall cost of capital, that is flexible, simple and futuristic, that ensures adequate control on affairs of business by the owners and so on.

(a) Minimal capital structure

(b) Moderate capital structure

(c) Optimal capital structure

(d) Deficit capital structure

10. ———— is a payment of additional shares to shareholders in lieu of cash.

(a) Stock split (b) Stock dividend

(c) Extra dividend (d) Regular dividend

## Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) State the rules of debits and credits.

Or

(b) Comment on the performance of arasu limited from the ratios given below :

| | Industry average ratio | Ratios of arasu Ltd |
|---|---|---|
| (i) Current Ratio | 2 : 1 | 2.5 : 1 |
| (ii) Debt-equity Ratio | 2 : 1 | 1 : 1 |
| (iii) Stock turnover ratio | 9.5 | 3.5 |
| (iv) Net profit margin ratio | 25.5% | 15.1% |

12. (a) List out the advantages and limitations of Break-Even Analysis.

Or

(b) What are the classification of Costs?

13. (a) Differentiate Standard Costing and Budgetary Control.

Or

(b) Standard cost of a product in a factory is predetermined as follows :

Material (5 units @ Rs. 4 each) 20

Labour (20 hours @ Rs. 1.50 per hour) 30

Overhead expenses 10

Total 60

During a period, 8,000 units were produced whose actual cost was as follows :

Material (40,500 units @ Rs. 5 each) 2,02,500

Labour (1,50,000 hours @ Rs. 1.60 each) 2,40,000

Overhead expenses 90,000

Total 5,32,500

Prepare a statement showing standard cost, actual cost and variances.

14. (a) Explain Time Value of Money.

Or

(b) Write brief note about financing decision.

15. (a) Explain Capital Structure.

Or

(b) What are the various types of dividend?

**Part C** $(5 \times 8 = 40)$

Answer any **five** questions.

16. Differentiate Cash Flow Analysis and Funds Flow Analysis.

17. You are the management accountant of XYZ Co. Ltd. The Managing director of the company seeks your advice on the following problem : the company produces a variety of products each having a number of computer parts. Product "B" takes 5 hours to produce on machine no.99198 working at full capacity. "B" has a selling price of Rs. 50 and a marginal cost, Rs. 30 per unit. "A-10" a component part could be made on the same machine in 2 hours for marginal cost of Rs. 5 per unit. The supplier's price is Rs. 12.50 per unit. Should the company make or buy "A 10"?

Assume that machine hour is the limiting factor.

18. The following information has been taken from a factory :

| | Rupees |
|---|---|
| Materials | 50,000 |
| Direct wages | 40,000 |
| Factory overheads | 30,000 |
| Administration overheads | 20,000 |

You are required to fix the selling price of a machine costing Rs. 4,200 in materials and Rs. 3,000 in wages so that it yields a profit of 25% on selling price.

19. Discover the factors affecting Working Capital Management?

20. Determine individual costs of capital.

21. From the Following Details Prepare a statement of Proprietary fund with as many details as possible.

1. Stock velocity 6
2. Capital turnover ratio 2
3. Fixed assets turnover ratio 4
4. Gross Profit Turnover Ratio 20%
5. Debtor's velocity 2 month
6. Creditor's velocity 73 days

Gross profit was Rs. 60,000.

Reverse and surplus amount Rs. 20,000.

Closing stock was Rs. 5000 in excess of opening stock.

22. Explain in detail Cost-Volume Profit Analysis.

23. What are the Classification of Budget?

| R8414 | Sub. Code |
|---|---|
| | 541204 |

**M.C.A. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Computer Applications**

**OPERATING SYSTEM**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Section A** $(10 \times 1 = 10)$

Answer **all** the questions.

1. The main function of the command interpreter

   (a) to handle the files in the operating system

   (b) to get and execute the next user specified command

   (c) to provide the interface between the API and application program

   (d) None of the above

2. BIOS is used by

   (a) compiler (b) interpreter

   (c) operating system (d) application software

3. If a process fails, most operating system write the error information to a

   (a) new file (b) another running process

   (c) log file (d) none of the above

4. Cascading termination refers to the termination of all child processes if the parent process terminates

   (a) Abnormally

   (b) Normally

   (c) Normally or abnormally

   (d) None of the above

5. Banker's algorithm is used

   (a) To solve the deadlock

   (b) for deadlock recovery

   (c) To prevent deadlock

   (d) None of these

6. CPU scheduling is the basis of ———————

   (a) multiprogramming operating system

   (b) larger memory sized systems

   (c) multiprocessor systems

   (d) None of the above

7. Page fault occurs when

   (a) deadlock occurs

   (b) page does not present in memory

   (c) buffering occurs

   (d) page is present in memory

8. DSM stands for

   (a) Direct system module

   (b) Direct system memory

   (c) Demoralized system memory

   (d) Distributed shared memory

9. The information about all files is kept in

(a) operating system

(b) swap space

(c) eparate directory structure

(d) All of the above

10. The operating system ———————— the links when traversing directory trees, to preserve the acyclic structure of the system.

(a) ignores (b) considers

(c) deletes (d) None of the above

**Section B** $(5 \times 5 = 25)$

Answer **all** the questions, choosing either (a) or (b).

11. (a) Define Operating System. Discuss its role from different perspectives.

Or

(b) Explain fundamental difference between network OS and distributed OS.

12. (a) Explain direct and indirect communications of message passing systems.

Or

(b) Explain the terms critical section and mutual exclusion.

13. (a) Differentiate between Job-scheduling and CPU-scheduling.

Or

(b) Explain the readers/writers problem.

14. (a) Discuss the steps involved in handling a page fault with a diagram.

Or

(b) Explain the concept of dynamic relocation of addresses.

15. (a) Explain the following (i) file types (ii) file operation (iii) file attributes.

Or

(b) Write short notes on various file access methods.

**Section C** $(5 \times 8 = 40)$

Answer any **five** questions.

16. Explain about different services of Operating Systems and explain each service.

17. Explain solution to producer-consumer problem using semaphores.

18. Explain the following

(a) Preemptive and non preemptive scheduling

(b) I/O bound and CPU bound

(c) Scheduler and dispatcher

19. Explain about fragmentation and its types in detail.

20. Discuss the methods used for implementing directories in detail.

21. Explain different sub components of an operating system.

22. Memory partitions of l00 kb, 500 kb, 200 kb, 300 kb, 600 kb are available how would best, worst, first fit algorithm to place processes 212,417,112,426 in order. Which is the best algorithm?

23. Discuss in detail about disk scheduling algorithms.

———————

**R8415**

**Sub. Code**
**541554**

**M.C.A. DEGREE EXAMINATION, APRIL – 2023**

**Second Semester**

**Computer Applications**

**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** $(10 \times 1 = 10)$

Answer **all** questions.

1. Who is the inventor of Artificial Intelligence?
   (a) Geoffrey Hinton (b) Andrew Ng
   (c) John McCarthy (d) Jürgen Schmidhuber

2. What is the goal of Artificial Intelligence?
   (a) To solve artificial problems
   (b) To extract scientific causes
   (c) To explain various sorts of intelligence
   (d) To solve real-world problems

3. Which of the following is not a type of Artificial Intelligence agent?
   (a) Learning AI agent
   (b) Goal-based AI agent
   (c) Simple reflex AI agent
   (d) Unity-based AI agent

4. ———————— number of informed search method are there in Artificial Intelligence.
   (a) 4 (b) 3
   (c) 2 (d) 1

5. Which of the factors affect the performance of learner system does not include?
   (a) Representation scheme used
   (b) Training scenario
   (c) Type of feedback
   (d) Good data structures

6. In language understanding, the levels of knowledge that does not include?
   (a) Phonological (b) Syntactic
   (c) Empirical (d) Logical

7. LISP was created by?
   (a) John McCarthy
   (b) Marvin Minsky
   (c) Alan Turing
   (d) Allen Newell and Herbert Simon

8. Which search method takes less memory?
   (a) Depth-First Search
   (b) Breadth-First search
   (c) Optimal search
   (d) Linear Search

9. Ambiguity may be caused by ————————
   (a) Syntactic ambiguity
   (b) Multiple word meanings
   (c) Unclear antecedents
   (d) All of the mentioned

10. What are the two subfields of Natural language processing?

(a) Symbolic and numeric

(b) Time and motion

(c) Algorithmic and heuristic

(d) Understanding and generation

**Part B** $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss about Production System its Elements in AI.

Or

(b) Write some reasons for Production, Downtimes.

12. (a) Explain briefly about (i) Declarative Knowledge (ii) Procedural Knowledge.

Or

(b) Discuss in detail about (i) Simple Relation Knowledge (ii) Inheritable Knowledge.

13. (a) Explain briefly about Machine Learning and its features.

Or

(b) List the advantages and disadvantages of Machine Learning.

14. (a) Explain in detail about Data Exploration in Machine Learning.

Or

(b) Discuss about Data processing and its importance.

15. (a) Explain briefly about (i) Mean (ii) Standard Deviation.

Or

(b) Discuss about Bayesian Belief Network in Artificial Intelligence.

**Part C** $(5 \times 8 = 40)$

Answer any **five** questions.

16. Discuss in detail about the functions of Production System.

17. Explain briefly about Hill Climbing and its features.

18. Discuss about different kinds of Knowledge that need to represent in AI.

19. Summaries the difference between the Procedural and Declarative Knowledge.

20. Discuss in detail about the classification of Machine Learning.

21. Summarize some of the issues in Machine Learning.

22. Discuss about (a) Data Cleaning (b) Data Integration.

23. Discuss in brief about the application of Statistical Tools in Different fields.

———————