R0282	Sub. Code
	541101

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Computer Applications

COMPUTER ARCHITECTURE AND ORGANIZATION

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** the following questions by choosing the correct option.

1. What is the binary representation of the decimal number 42? (CO1, K5)

   (a) 101010 (b) 101001

   (c) 110100 (d) 100100

2. In the binary number system, what is the value of the leftmost bit in a signed integer representation? (CO1, K2)

   (a) Positive sign

   (b) Negative sign

   (c) Most significant bit

   (d) Least significant bit

3. The CPU's clock speed is measured in: (CO2, K2)

(a) Hertz (Hz) (b) Kilobytes (KB)

(c) Megabits (Mb) (d) Gigabytes (GB)

4. What is the primary function of the CPU in a computer system? (CO2, K2)

(a) Input data from peripherals

(b) Execute program instructions

(c) Store long-term data

(d) Manage power supply

5. Which CPU component holds the memory address of the data that is currently being accessed or modified? (CO3, K2)

(a) Program Counter (PC)

(b) Stack Pointer (SP)

(c) Memory Address Register (MAR)

(d) Accumulator (ACC)

6. Which of the following is NOT a primary function of the CPU? (CO3, K2)

(a) Arithmetic and Logic Operations

(b) Input/Output Operations

(c) Control Unit Operations

(d) Data Storage

7. Which CPU component is responsible for holding data that is ready to be processed by the ALU? (CO4, K2)

(a) Program Counter (PC)

(b) Accumulator

(c) Stack Pointer (SP)

(d) Memory Address Register (MAR)

8. What does the Control Unit (CU) do in the CPU? (CO4, K2)

(a) Executes program instructions

(b) Performs arithmetic calculations

(c) Manages data storage

(d) Coordinates the activities of all CPU components

9. The small extremely fast, RAM's all called as ———— (CO5, K2)

(a) Heaps (b) Accumulators

(c) Stacks (d) Cache

10. While using the direct mapping technique, in a 16 bit system the higher order 5 bits are used for ———— (CO5, K2)

(a) Id (b) Word

(c) Tag (d) Block

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Using DeMorgan's theorem, show that :

(i) (A+B)' (A'+B')' = 0

(ii) A + A' B+A' B' = 1 (CO1, K3)

Or

(b) Describe the fixed point and floating point representation. (CO1, K2)

12. (a) Bring out the difference between combinational logic and sequential logic. (CO2, K6)

Or

(b) With a neat logic diagram explain the operation of D and T flip-flops. (CO2, K3)

13. (a) Illustrate the major phases involved in processing an instruction with a flowchart. (CO3, K3)

Or

(b) Explain the Interrupt-Initiated I/O in detail. (CO3, K2)

14. (a) Briefly describe the various program control instructions. (CO4, K2)

Or

(b) Identify any two applications of stack organization. (CO4, K5)

15. (a) Elaborate the design of interfacing I/O devices with a block diagram. (CO5, K6)

Or

(b) Describe Asynchronous data transfer. (CO5, K2)

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

Answer **all** the questions not more than 1000 words each.

16. (a) Describe the two level implementation of combinational circuit. (CO1, K1)

Or

(b) Simplify the following Boolean function in sum-of-products form by means of a four-variable Karnaugh map. $F(A,B,C,D) = \Sigma(0,2,8,9,10,11,14,15)$. (CO1, K3)

17. (a) Design a half adder as a two-level AND-OR circuit and show how to implement a full adder using two half adders and a external logic gate. (CO2, K6)

Or

(b) Design an adder to perform arithmetic addition of two decimal bits in BCD. (CO2, K6)

18. (a) Bring out the complete control sequence for executing the instruction ADD R1, (R2) for the single bus processor. (CO3, K5)

Or

(b) Draw Timing and Control unit of basic computer and Explain. (CO3, K3)

19. (a) Explain the different type of addressing modes with suitable example. (CO4, K2)

Or

(b) Identify the various Data transfer and manipulation instruction to perform operations on computer. (CO4, K5)

20. (a) With a neat sketch bring out the data driven techniques adopted in DMA. (CO5, K2)

Or

(b) Discuss the concept of virtual memory and explain how a virtual memory system is implemented, pointing out the hardware and software support. (CO5, K2)

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R0283	Sub. Code
	541102

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Computer Applications

OBJECT ORIENTED PROGRAMMING AND C++

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** the following questions by choosing the correct option.

1. Which of these features of OOP would indicate code reusability? (CO1, K2)

   (a) Polymorphism (b) Abstraction

   (c) Inheritance (d) Encapsulation

2. Object oriented programming employs _____ programming approach. (CO1, K2)

   (a) top-down (b) procedural

   (c) bottom-up (d) all of these

3. Default return type of functions in CPP is (CO2, K3)

   (a) void (b) long

   (c) char (d) Int

4. What is an object in c++? (CO2, K2)

   (a) It is a function of class

   (b) It is an instance of the class

   (c) It is the data type of class

   (d) It is part of the syntax of class

5. Why is a virtual function mainly used to achieve? (CO3, K1)

(a) Function code polymorphism

(b) Interpreter polymorphism

(c) Compile-time polymorphism

(d) Runtime polymorphism

6. Virtual functions should be defined in. (CO3, K1)

(a) Derived class

(b) Base class

(c) Both base and derived class

(d) None

7. What is a template? (CO4, K1)

(a) A template is a formula for creating a generic class

(b) A template is used to manipulate the class

(c) A template is used for creating the attributes

(d) None of the above

8. What are Iterators? (CO4, K1)

(a) Iterators are used to iterate over C-like arrays

(b) Iterators are used to iterate over pointers

(c) Iterators are used to point memory addresses of STL containers

(d) Iterators are used to iterate over function

9. Which keyword is used to handle the expection? (CO5, K1)

(a) Try (b) Throw

(c) Catch (d) None of the above

10. Which of the following exceptions can be generated in the C++ program? (CO5, K1)

(a) Divide by zero (b) File not found

(c) Index out of bound (d) Buffer overflow

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Write down the is program structure of C++. (CO1, K2)

Or

(b) Narrate the features of OOPS. (CO1, K2)

12. (a) Explain the principles of function overloading. (CO2, K2)

Or

(b) Illustrate the Recursive Functions with an example. (CO2, K3)

13. (a) What are the rules for virtual functions? (CO3, K1)

Or

(b) Write the significance of pure virtual functions in C++. (CO3, K2)

14. (a) Explain the different forms of File Opening Modes. (CO4, K2)

Or

(b) Explain the role of seekg( ), seekp( ), tellg( ) and tellp( ) functions in the process of random. (CO4, K5)

15. (a) Write a program in C++ to handle "divide by zero" exception. (CO5, K6)

Or

(b) What are the tasks that are performed by the error handling mechanism? (CO5, K2)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Define Object-oriented programming and Explain feature of Object oriented programming. How it is different than procedure oriented programming? (CO1, K3)

Or

(b) Illustrate C++ Data Types. (CO1, K2)

17. (a) What is Constructor? Explain types of Constructor with example. (CO2, K2)

Or

(b) What is object and how to implement in C++ program? (CO2, K2)

18. (a) Classify the types of Inheritance with an example. (CO3, K3)

Or

(b) With a suitable example explain Abstract Base Class. (CO3, K2)

19. (a) Write a C++ program using function template to find the product of two integer or floating point type of data. (CO4, K6)

Or

(b) Explain the Standard Template Library and how it is working principles. (CO4, K2)

20. (a) Draw a neat and clean diagram to show exception handling model in C++. (CO5, K6)

Or

(b) Write down a detailed C++ program to demonstrate the use of try, catch, throw and nested try. (CO5, K6)

R0284	Sub. Code 541103

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Computer Applications

RELATIONAL DATABASE MANAGEMENT SYSTEM

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** the following objective questions by choosing the correct answer.

1. The ———— of a database describes its overall structure. (CO1, K1)

   (a) Schema (b) Instance

   (c) Design (d) Structure

2. ———— offers the ability to query the data and insert, alter, and delete tuples. (CO1, K2)

   (a) Transaction Control Language (TCL)

   (b) Data Control Language (DCL)

   (c) Data Definition Language (DDL)

   (d) Data Manipulation Language (DML)

3. Which of the following is used to denote the selection operation in relational algebra? (CO2, K1)

   (a) Pi (b) Sigma

   (c) Lambda (d) Omega

4. ———————— is fundamental operation in relational algebra (CO2, K2)

(a) Set intersection (b) Natural join

(c) Select (d) None of the mentioned

5. Which operator is used to compare a value to a specified list of values? (CO3, K1)

(a) ANY (b) BETWEEN

(c) ALL (d) IN

6. 4NF is designed to cope with: (CO3, K1)

(a) Transitive dependency

(b) Join dependency

(c) Multi valued dependency

(d) None of these

7. Which of the following makes the transaction permanent in the database? (CO4, K1)

(a) View (b) Commit

(c) Rollback (d) Flashback

8. In order to maintain the consistency during transactions database provides (CO4, K1)

(a) Commit (b) Atomic

(c) Flashback (d) Retain

9. Hash files are stored in memory in a ———————— order. (CO5, K1)

(a) Consecutive (b) Random

(c) Simultaneous (d) Line by line

10. ———————— is used to link the leaf nodes in the B+ tree. (CO5, K1)

(a) Stack (b) Queue

(c) Linked List (d) None

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Enumerate the problems in file system data management. (CO1, K3)

Or

(b) What are the levels of data abstraction? Explain. (CO1, K2)

12. (a) State about PROJECT operation in Relational algebra. (CO2, K2)

Or

(b) Explain the set operations. (CO2, K3)

13. (a) List and explain various DML, DDL commands in SQL. (CO3, K3)

Or

(b) Explain various Data types used in SQL. (CO3, K3)

14. (a) Define a Transaction. List the properties of transaction. (CO4, K2)

Or

(b) What is timestamp? Explain different timestamps used by a transaction. (CO4, K3)

15. (a) Explain the structure of B^+ tree. (CO5, K3)

Or

(b) Compare I/O costs for all file organizations. (CO5, K3)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain E-R model in detail. (CO1, K3)

Or

(b) Draw an ER diagram for the relations Student and Department with relevant relationships. (CO1, K4)

17. (a) Define join operation. Explain different join operations in detail. (CO2, K3)

Or

(b) Explain Aggregate Functions with suitable examples. (CO2, K3)

18. (a) Explain about 1NF, 2NF with relevant examples. (CO3, K3)

Or

(b) Define Functional Dependencies. Discuss about different functional dependencies. (CO3, K3)

19. (a) Discuss different phases (states) of transaction. (CO4, K3)

Or

(b) Illustrate Concurrent execution of transaction with examples. (CO4, K5)

20. (a) Explain in detail about ISAM. (CO5, K3)

Or

(b) With suitable example explain the insertion and deletion operations which are performed in B^+ tree (CO5, K4)

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R0285	Sub. Code
	541104

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Computer Applications

DISCRETE MATHEMATICS

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** the following objective questions by choosing the correct option.

1. $\neg P \vee Q \Leftrightarrow$ _____. (CO1, K1)

(a) $P \to Q$ (b) $Q \to P$

(c) $P \to P$ (d) $Q \to Q$

2. A formula which is equivalent to a given formula and which consists of product of elementary sums is called _____ of the given formula (CO1, K1)

(a) DNF (b) CNF

(c) NOR (d) NAND

3. Commutative law is (CO2, K1)

(a) $A = B$ (b) $A' = B$

(c) $A \cap B = B \cap A$ (d) $A - B = 0$

4. A relation R is a set X is called _____ if it reflexive, symmetric and transitive. (CO2, K2)

(a) coset (b) poset

(c) well ordered (d) equivalence relation

5. For the semigroup (N, x), let the T be set of multiples of a positive m, then (T, x) is a _____ of (N, x). (CO3, K2)

(a) subsemigroup (b) subgroup

(c) group (d) monoid

6. Any one-to-one mapping of a set S onto S is called a _____ of S. (CO3, K1)

(a) group (b) composition

(c) permutation (d) function

7. The number of_____ appearing in the sequence of a path is called the length of the path. (CO4, K1)

(a) vertexes (b) edges

(c) walks (d) graphs

8. A graph in which weights are assigned to every edge is called a _____. (CO4, K1)

(a) null graph (b) point graph

(c) digraph (d) weighted graph

9. Let S be the sample space then P(S) = _____.

(CO5, K2)

(a) 0 (b) 1

(c) 0.5 (d) None of these

10. The mean of binomial distribution is 8 and variance is 6 then q = _____. (CO5, K2)

(a) 4/3 (b) 3/4

(c) 3/2 (d) 2/3

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Show that (CO1, K3)

$$P \to (Q \to R) \Leftrightarrow P \to (\neg Q \vee R) \Leftrightarrow (P \wedge Q) \to R$$

Or

(b) Does P follow from $P \vee Q$. (CO1, K3)

12. (a) Show that for any two sets A and B, $A - (A \cap B) = A - B$. (CO2, K4)

Or

(b) If $A = \{\alpha, \beta\}$ and $B = \{1, 2, 3\}$ what are $A \times B$, $B \times B$, $A \times A$, $B \times B$ and $(A \times B) \cap (B \times A)$?

(CO2, K3)

13. (a) Given the algebraic system (N, +) and (Z_4, $+_4$), Where N is the set of natural numbers and + is the operation of addition on N, Show that there exists a homomorphism from (N, +) to (Z_4, $+_4$). (CO3, K3)

Or

(b) Let (S, *) and (T, Δ) be two semigroups and g be the semi-group homomorphism from (S, *) to (T, Δ). Prove that the corresponding to the homomorphism g, there exists a congruence relation R on (S, *) is defined by x R y iff $g(x) = g(y)$ for $x, y \in S$ (CO3, K3)

14. (a) In a simple digraph, the length of any elementary path is less than or equal to n-1, where n is the number of nodes in the graph. Prove. (CO4, K4)

Or

(b) Show that every graph has at least 2 vertices that are NOT cut vertices. (CO4, K3)

15. (a) An integer is chosen at random out of the integers from 1 to 100. What is the probability that, it is (i) multiple of 5 (ii) divisible by 7 (iii) greater than 70? (CO5, K3)

Or

(b) If a pair of dice is thrown find the probability that the sum is neither 7 nor 11. (CO5, K3)

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

Answer **all** questions not more than 1000 words each.

16. (a) Show that $R \wedge (P \vee Q)$ is a valid conclusion from the premises $P \vee Q, Q \to R$, $P \to M$ and $\neg M$. (CO1, K4)

Or

(b) Show that $(x)(P(x) \vee Q(x)) \Rightarrow (x)P(x) \vee (\exists x)Q(x)$.

(CO1, K4)

17. (a) (i) Let X = {1, 2, 3, 4}. (CO2, K4)

If $R = \{(x, y) \mid x \varepsilon X \wedge y \varepsilon X \wedge ((x - y)$ in an integral nonzero multiple of 2};

$S = \{(x, y) \mid x \varepsilon X \wedge y \varepsilon X \wedge ((x - y)$ is an integral nonzero multiple of 3}. Find $R \cup S$, $R \cap S$, $R - S, S - R$.

(ii) If X = {1, 2, 3,....}, Find $R \cup S$, $R \cap S$, $R - S, S - R$.

Or

(b) Let R and S be two relations on a set of positive integers I : R = $\{(x, 2x) \mid x \varepsilon I\}$, $S = \{(x, 7x) \mid x \varepsilon I\}$. Find R o S, R o R, R o R o R and R o S o R. (CO2, K4)

18. (a) The subset H = {[0], [l]} is a subgroup of (Z_4, $+_4$). Show that the left cosets of H in G determined by the elements of G are {[l], [3]} and {[0], [2]}, which is a partition of Z_4. (CO3, K4)

Or

(b) Prove that every finite group of order n is isomorphic to a permutation group f degree n.

(CO3, K4)

19. (a) Narrate the steps of WARSHALL algorithm.

(CO4, K5)

Or

(b) Let the (T, v) be a rooted tree. Then prove that

(i) There is no cycles in T

(ii) v is the only root of T

(iii) Each vertex in t, other than v, has in-degree one, and v has in- degree zero. (CO4, K4)

20. (a) The results of examinations in two papers A and B for 20 candidates were as follows:
8 candidates passed in paper A; 7 candidates passed in paper 8; 8 candidates passed in both paper A and paper B.

If out of these candidates one is selected, what is the probability that he / she (i) passed in both the papers (ii) failed only in A (iii) failed in A or B.

(CO5, K5)

Or

(b) The screws are produced by a certain machine were checked by examining number of defectives in a sample of 8. The following table shows the distribution of 128 samples according to the number of defective items they contained:

No. of defective sample of 8	0	1	2	3	4	5	6	7	Total
No. of sample	7	6	19	35	30	23	7	1	128

(i) Fit a binomial distribution and find the expected frequencies if the chance of machine being defective is 1/2.

(ii) Find the mean and standard deviation of the fined distribution. (CO5, K5)

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R0286	Sub. Code
	541551

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

First Semester

Computer Applications

Elective – COMPUTER NETWORKS

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option.

1. Some broadcast systems support transmission to a subnet of the machines. (CO1, K1)

   (a) Multi casting

   (b) Bras casting

   (c) Subnet casting

   (d) Support casting

2. Give the expansion for UDP (CO1, K1)

   (a) User Data Protocol

   (b) User Datagram Protocol

   (c) User Durable Protocol

   (d) User Dummy Protocol

3. Mention the loss of energy as the signal propagates outward (CO2, K2)

(a) Lossy Signal

(b) Outward Signal

(c) Attenuation

(d) Lossination

4. When the telephone is acquired by the new base station before the previous one signs off, it is called as any one of the following (CO2, K2)

(a) Hard Handoff

(b) Medium Handoff

(c) Tele Handoff

(d) Soft Handoff

5. Number of bit positions in which two codewords differ (CO3, K3)

(a) Hamming Distance

(b) Hamming Code

(c) Hamming Position

(d) Hamming Numbers

6. Write the expansion for PAR (CO3, K3)

(a) Positive Acknowledgement with Rotation

(b) Positive Acknowledgement with Retransmission

(c) Positive Acknowledgement with Readiness

(d) Positive Acknowledgement with Reply

7. The variation in the packet arrival times called (CO4, K4)

(a) Jammer

(b) Jimmer

(c) Jitter

(d) Jumper

8. Service access point (SAP) between the transport layer and the communication control layer is a (CO4, K4)

(a) Transport Service Access Position

(b) Transport Service Access Control

(c) Transport Service Access Layer

(d) Transport Service Access Point

9. They are strings of Text that can are links to other pages (CO5, K5)

(a) Hyperlinks

(b) Hypertext

(c) Hyperpage

(d) Hyperstrings

10. What is the art of devising ciphers and breaking them (CO5, K5)

(a) Crypanalysis

(b) Cryptography

(c) Cryptcipers

(d) Cryptart

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Write short note on MAN and WAN. (CO1, K2)

Or

(b) Compare TCP/IP and OSI Reference Models. (CO1, K2)

12. (a) Explain any two unguided transmission media used in Computer Networks. (CO2, K2)

Or

(b) Write short note on First Generation Mobile Phones. (CO2, K2)

13. (a) Discuss in detail about the Error Correcting Codes. (CO3, K3)

Or

(b) Explain about Simplex Stop and Wait Protocol. (CO3, K1)

14. (a) Briefly describe about Flooding with an example. (CO4, K2)

Or

(b) Explain the Leaky bucket Algorithm. (CO4, K5)

15. (a) Write short note on Basic Functions of Email. (CO5, K2)

Or

(b) Give detailed note on Transposition Ciphers. (CO5, K2)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain the OSI Reference Model with a neat diagram. (CO1, K1)

Or

(b) Describe the different types of Topologies in Computer Networks. (CO1, K1)

17. (a) Explain in detail about Communication Satellites. (CO2, K2)

Or

(b) Discuss about the following in detail: (CO2, K2)

(i) VRC

(ii) LRC

(iii) CRC

18. (a) Describe the different types of Switching with examples. (CO3, K1)

Or

(b) Explain Link State Routing with an example. (CO3, K5)

19. (a) Discuss about SMTP, POP3 and MIME with examples. (CO4, K1)

Or

(b) Explain about DNS and SNMP with examples. (CO4, K5)

20. (a) Describe about the DES and Triple DES with examples. (CO5, K5)

Or

(b) Explain the RSA algorithm with an example. (CO5, K5)

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R0287	Sub. Code
	541301

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Computer Applications

DATA SCIENCE AND BIG DATA ANALYTICS

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** the following objective questions by choosing the correct option.

1. Data in ———— bytes size is called Big Data.(CO1, K1)

   (a) Tera (b) Giga

   (c) Peta (d) Meta

2. How many V's of Big Data? (CO1, K1)

   (a) 2 (b) 3

   (c) 4 (d) 5

3. Data that does not conform to a data model or data schema is known as ————. (CO2, K2)

   (a) Structured data

   (b) Unstructured data

   (c) Semi-structured data

   (d) All

4. Amongst which of the following is/are not Big Data Technologies? (CO2, K2)

(a) Apache Hadoop (b) Apache Spark

(c) Apache Kafka (d) Apache Pytarch

5. ———— programming language is a dialect of S. (CO3, K3)

(a) B (b) C

(c) R (d) K

6. Finally, in ———— R version 1.0.0 was released to the public. (CO3, K3)

(a) 2000 (b) 2005

(c) 2010 (d) 2012

7. The R-help and ———— mailing lists have been highly active for over a decade now. (CO4, K3)

(a) R-mail (b) R-devel

(c) R-dev (d) R-del

8. ———— partitions the objects into different groups. (CO4, K4)

(a) Mapping (b) Clustering

(c) Classification (d) Prediction

9. Clustering is ————. (CO5, K4)

(a) Supervised learning

(b) Unsupervised learning

(c) (a) and (b) both

(d) None of the above

10. Data Analytics uses ———— to get insights from data. (CO5, K5)

(a) Statistical figures

(b) Numerical aspects

(c) Statistical methods

(d) None of the above

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) List the important uses of Data Analytics. (CO1, K1)

Or

(b) Explain in detail about the characteristics of Hadoop. (CO1, K1)

12. (a) Explain about (i) Data Collection (ii) Data Cleaning. (CO2, K2)

Or

(b) Summaries the applications of R programming. (CO2, K2)

13. (a) List out the differences between K Means and Hierarchical Clustering. (CO3, K3)

Or

(b) With suitable example explain. Apriori algorithm. (CO3, K3)

14. (a) Explain in detail about Information Gain. (CO4, K5)

Or

(b) List areas where the genetic algorithms is utilized. (CO4, K5)

15. (a) Compare Hadoop verses MapReduce. (CO5, K4)

Or

(b) Classify the important usage of MongoDB. (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain in detail about the four types of data analytics. (CO1, K1)

Or

(b) Explain about (i) Data Identification (ii) Data Extraction. (CO1, K1)

17. (a) Discuss various types of Dirty data in detail. (CO2, K2)

Or

(b) Summarize the types of ANOVA tests in detail. (CO2, K2)

18. (a) Describe in detail about different types of Clustering Algorithms. (CO3, K3)

Or

(b) Explain number of clusters in a data set and explain it. (CO3, K3)

19. (a) Describe Time Series analysis with suitable example. (CO4, K5)

Or

(b) Explain briefly about Autoregressive Integrated Moving Average. (CO4, K5)

20. (a) Categorize the characteristics and applications of HBase. (CO5, K4)

Or

(b) Discuss important advantage and disadvantages of Data Visualization. (CO5, K1)

R0288	Sub. Code
	541302

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Computer Applications

PYTHON PROGRAMMING

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer ALL the following objective questions by choosing the correct option.

1. Which type of Programming does Python support? (CO1, K2)

   (a) object-oriented programming

   (b) structured programming

   (c) functional programming

   (d) all of the mentioned

2. What will be the output of the following Python expression? (CO1, K2)

   >>>round(4.576)

   (a) 4 (b) 4.6

   (c) 5 (d) 4.5

3. What will be the output of the following program? (CO2, K3)

```
for i in range(10, 2, –2):
        print(i, end="")
print( )
```

(a) 2 4 6 8 10

(b) 10 8 6 4 2

(c) 10 8 6 4

(d) None

4. The output of the following program is ————————. (CO2, K4)

```
nameList = ['Suresh', 'Karthik', 'Balu', 'Durai']
print(nameList[1] [–1]
```

(a) h (b) u

(c) i (d) k

5. What will be the output of the following Python code? (CO3, K3)

```
print("abc. DEF".capitalize( ))
```

(a) Abc. def (b) abc. def

(c) Abc. Def (d) ABC. DEF

6. Which of the following commands will create a list? (CO3, K2)

(a) list1 = list( )

(b) list1 =[ ]

(c) list1 = list([1, 2, 3])

(d) all of the mentioned

7. Which of the following is not a core data type in Python programming? (CO4, K2)

(a) Tuples

(b) Lists

(c) Class

(d) Dictionary

8. ———————— is used to create an object. (CO4, K1)

(a) Class

(b) Constructor

(c) User-defined functions

(d) In-built functions

9. CSV stands for ————————. (CO5, K1)

(a) Comma Separated Value

(b) Common Shell Value

(c) Comma Seperated Variable

(d) Common Structure Variable

10. SQLite is a ————————. (CO5, K5)

(a) Data Structure (b) Database

(c) Cursor (d) None

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

Answer **all** the questions not more than 500 words each.

11. (a) What is identifier? Also list the rules to name identifier. (CO1, K1)

Or

(b) Write short notes on membership operator and identity operators with suitable example. (CO1, K4)

12. (a) Explain the concept of strings in Python, including immutability and the use of string slices. (CO2, K2)

Or

(b) Define Module. Elaborate different ways to import modules in python. (CO2, K1)

13. (a) When to use break and continue statement in python? Discuss its differences with suitable example. (CO3, K3)

Or

(b) Write a program to do matrix addition and multiplication using for loop with two input value a=[[1, 1],[1, 1]] and b=[[2, 2], [2, 2]]. (CO3, K4)

14. (a) What is python constructor? Explain its types. (CO4, K2)

Or

(b) What is single inheritance? Explain. (CO4, K1)

15. (a) Discuss the steps to connect the python applications to the database. (CO5, K3)

Or

(b) Create a table named 'Employee' will have the four columns, i.e., name, id, salary, and department_id initially. Write a query to create table and insert 2 rows. (CO5, K5)

Part C

$(5 \times 8 = 40)$

Answer **all** the questions not more than 1000 words each.

16. (a) Explain in detail about datatypes in python. (CO1, K1)

Or

(b) Write any eight string operations in python with example. (CO1, K5)

17. (a) Explain the concept of functions and their importance in Python programming. Also, discuss the difference between parameters and arguments with example. (CO2, K3)

Or

(b) What are tuples in Python? How they can be used for tuple assignment. (CO2, K3)

18. (a) Write brief note on python if-else statement. Give Example. (CO3, K2)

Or

(b) Write a program to implement the concept of 'while' loop. (CO3, K2)

19. (a) Create two classes i.e. Person (parent class) and Employee (Child Class). The Employee class inherits from the Person class. Use the methods of the person class through the employee class to display the name id-number and other details. A child class can also modify the behavior of the parent class. Write a python code to demonstrate how parent constructors are called. (CO4, K4)

Or

(b) Develop a CSV to search an element in a database. (CO4, K3)

20. (a) How to import CSV file into python using pandas? Write the stops with suitable example. (CO5, K5)

Or

(b) Explain database operations in python and also discuss the python – MySQL connectivity. (CO5, K2)

———————

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	541303

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Computer Applications

SOFTWARE ENGINEERING

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 1 = 10)

Answer **all** the following objective questions by choosing the correct option

1. What are the features of Software Code? (CO1, K1)

   (a) Simplicity (b) Accessibility

   (c) Modularity (d) All

2. _____ is a software development activity that is not a part of software processes. (CO1, K1)

   (a) Validation (b) Specification

   (c) Development (d) Dependence

3. Attributes of good software is _____ (CO2, K2)

   (a) Development

   (b) Maintainability and functionality

   (c) Functionality

   (d) Maintainability

4. The Cleanroom philosophy was proposed by _____ (CO2, K2)

   (a) Linger (b) Mills

   (c) Dyer (d) All of the mentioned above

5. Who proposed the spiral model? (CO3, K3)

(a) Barry Boehm (b) Pressman

(c) Royce (d) IBM

6. Which of the following are CASE tools? (CO3, K3)

(a) Central Repository

(b) Integrated Case Tools

(c) Upper Case Tools

(d) All of the mentioned

7. Software patch is defined as ———————— (CO4, K3)

(a) Daily or routine Fix

(b) Required or Critical Fix

(c) Emergency Fix

(d) None of the mentioned

8. _____ is not a fundamental activity for software processes in software development. (CO4, K4)

(a) Evolution (b) Design and implementation

(c) Validation (d) Verification

9. 4GT Model is a set of _____ (CO5, K4)

(a) Programs (b) CASE Tools

(c) Software tools (d) None of the mentioned

10. _____ is not suitable for accommodating any change? (CO5, K5)

(a) RAD Model

(b) Waterfall Model

(c) Build and Fix Model

(d) Prototyping Model

Section B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each

11. (a) Show the different types of Software Myths. (CO1, K2)

Or

(b) Summaries the characteristics of the Maturity levels in Software Engineering. (CO1, K2)

12. (a) Describe various types of Feasibility in Software Engineering. (CO2, K4)

Or

(b) Classify the important concept of Software Requirement Validation. (CO2, K4)

13. (a) List some important objectives of Software Design. (CO3, K1)

Or

(b) Explain in detail about the Interface Design. (CO3, K1)

14. (a) Discuss different types of approach in Software Testing. (CO4, K4)

Or

(b) Explain about Software quality attribute approach. (CO4, K2)

15. (a) List some benefits of Software Quality Assurance. (CO5, K1)

Or

(b) Explain about the Agile Methodology in detail. (CO5, K4)

Section C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each

16. (a) Explain in detail about Layered technology in Software Engineering. (CO1, K2)

Or

(b) Illustrate with neat diagram about the sequential phase in waterfall model. (CO1, K2)

17. (a) Classify the importance of Software requirement specification. (CO2, K4)

Or

(b) Generate the important key benefits of Data Modeling. (CO2, K4)

18. (a) Explain in detail about the Software Design Process. (CO3, K2)

Or

(b) Discuss in detail about different Software Architecture Patterns. (CO3, K4)

19. (a) Explain in detail about (i) Unit Testing (ii) Integration Testing. (CO4, K2)

Or

(b) Outline some of the other important Software metrics. (CO4, K2)

20. (a) Compare the difference between Agile model and Non-Agile model. (CO5, K4)

Or

(b) Determine some important Agile project management principles. (CO5, K1)

———————

R0290	Sub. Code
	541304

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Computer Applications

INFORMATION AND CYBER SECURITY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective by choosing the correct option questions.

1. What is the meaning of cipher in cryptography? (CO1, K1)
   (a) an algorithm that performs encryption
   (b) an algorithm that generates a secret code
   (c) an algorithm that performs encryption or decryption
   (d) a secret code

2. Vigenere table consists of ——————— (CO1, K2)
   (a) 26 rows and 26 columns
   (b) 26 rows and 1 column
   (c) 1 row and 26 columns
   (d) 27 rows and 27 columns

3. Conventional cryptography also known as ——————— encryption. (CO2, K2)
   (a) logical-key (b) symmetric-key
   (c) asymmetric-key (d) none of these

4. ———————— uses the concept of pseudo random sequence. (CO2, K3)

(a) Stram cipher (b) DES encryption

(c) Casear cipher (d) Block cipher

5. The main motive for using steganography is that hackers or other users can hide a secret message behind a ———————— (CO3, K3)

(a) special file (b) ordinary file

(c) program file (d) encrypted file

6. When a hash function is used to provide message authentication, the hash function value is called to as. (CO3, K3)

(a) Message Field (b) Message Score

(c) Message Digest (d) Message Leap

7. Verification of electronic record is possible through ———————— (CO4, K3)

(a) public key (b) private Key

(c) e-governance (d) digital Signature

8. What type of environment is best suited for iris recognition technology ? (CO4, K3)

(a) Indoor, controlled lighting

(b) Natural lighting

(c) Dark environments

(d) All environments

9. Which of the following refers to exploring the appropriate, ethical behaviors related to the online environment and digital media platform? (CO5, K5)

(a) Cyber low (b) Cyber ethics

(c) Cyber security (d) Cyber safety

10. A software program or a hardware device that filters all data packets coming through the internet, a network, etc. it is known as ———————— (CO5, K5)

(a) Antivirus (b) Cookies

(c) Malware (d) Firewall

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

Answer **all** the questions not more than 500 words each.

11. (a) Explain short note about vernam cipher. (CO1, K2)

Or

(b) Explain the concept of Monoalphabetic Substitution Cipher with example. (CO1, K2)

12. (a) Write short note on Symmetric cipher model. (CO2, K2)

Or

(b) Discuss about The Chinese Remainder Theorem in cryptography. (CO2, K2)

13. (a) What is Steganography? Explain any of two types. (CO3, K3)

Or

(b) Explain the essential properties of Hash functions. (CO3, K3)

14. (a) Explain in detail about authentication. (CO4, K3)

Or

(b) Write short note on X.509 Protocol. (CO4, K3)

15. (a) Explain: Disk forensics (CO5, K5)

Or

(b) What are the classifications of cybercrime? Explain. (CO5, K5)

Part C (5 × 8 = 40)

Answer ALL the questions not more than 1000 words each.

16. (a) Explain the concept of Playfair cipher with example. (CO1, K2)

Or

(b) Explain the concept of Vigenère Cipher with suitable example. (CO1, K2)

17. (a) Describe the working principle of DES Algorithm. (CO2, K2)

Or

(b) Discuss about the Knapsack Public Key Encryption. (CO2, K2)

18. (a) Explain in detail about audio video steganography. (CO3, K3)

Or

(b) Discuss about various applications of steganography. (CO3, K3)

19. (a) Discuss about the technological issues in biometric systems. (CO4, K3)

Or

(b) Explain in detail about digital signature with example. (CO4, K3)

20. (a) Elaborate network forensics with example. (CO5, K5)

Or

(b) Explain the concept of Incident and Incident handling with example. (CO5, K5)

———————

R0291	Sub. Code
	541558

M.C.A. DEGREE EXAMINATION, NOVEMBER – 2023

Third Semester

Computer Applications

Elective : VIRTUAL REALITY AND AUGMENTED REALITY

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** the following objective questions by choosing the correct option.

1. What does VR stand for? (CO1, K1)

   (a) Very Right (b) Vertal Reality

   (c) Virtual Reality (d) Virtual Realty

2. What are the three types of virtual reality? (CO1, K1)

   (a) 3D, Non-Immersive, Digital

   (b) Immersive, 3D,Non-Immersive

   (c) Digital, Semi-Immersive, Projective

   (d) Immersive, Semi-Immersive,Non-immersive

3. Which one of the senses does not applied in virtual Reality? (CO2, K2)

   (a) Vision (b) Sound

   (c) Taste (d) Touch

4. A term for Illusion of immersion by projecting stereo images on the walls and floor of a room (CO2, K2)

(a) GUI (b) HMD

(c) BOOM (d) CAVE

5. Geometric modeling includes (CO3, K3)

(a) Graphical information

(b) Non-Graphical information

(c) Both

(d) None of the above

6. What kind of tracking technology is used on the Head-Mounted Display? (CO3, K3)

(a) Electromagnetic (b) Mechanical

(c) Optical (d) Neural

7. Which definition best fits " Augmented Reality"? (CO4, K2)

(a) Technology that turns physical objects into digital objects

(b) Technology that can achieve a human-level understanding of images

(c) Technology that overlays digital information on top of real world items

(d) Technology that completely immerses users in a new digital environment

8. Which is caused by Augmented Reality? (CO4, K1)

(a) Holocaust (b) Hologram

(c) Holophrastic (d) Screen saver

9. X3D has evolved from its beginnings as the ———— ? (CO5, K2)

(a) XML (b) XRML

(c) VRML (d) HTML

10. Applications of virtual Reality in Digital Entertainment? (CO5, K5)

(a) Videos games (b) Virtual museums

(c) Theatre (d) All the above

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

Answer **all** the questions, not more than 500 words each.

11. (a) Explain the primary features of Virtual reality with examples. (CO1, K2)

Or

(b) Write short note on Development Features of virtual reality. (CO1, K2)

12. (a) Discuss about the 3d Scanner. (CO2, K3)

Or

(b) Explain the concept of hardware technology on stereoscopic Display. (CO2, K3)

13. (a) Explain about Behavior Simulation and Physically Based Simulation. (CO3, K4)

Or

(b) What is the different modeling techniques used in virtual reality? (CO3, K3)

14. (a) Explain the system structure of Augmented reality? (CO4, K3)

Or

(b) Write short note on Customization and Development of AR technologies. (CO4, K3)

15. (a) Explain any two development tools in VR. (CO5, K5)

Or

(b) How the VR Technology works in Physical Exercises and Games? (CO5, K5)

Section C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Write notes on fundamental Concept and Components of typical VR system. (CO1, K2)

Or

(b) Explain about Features and Present Development on Virtual Reality. (CO1, K2)

17. (a) Write detail note on Multiple Modals of Input and Output Interface in Virtual Reality. (CO2, K3)

Or

(b) Explain about Management of Large-Scale Environments & Real Time Rendering. (CO2, K3)

18. (a) What is the significance of Interactive Techniques in Virtual Reality? (CO3, K4)

Or

(b) Explain about commonly used body parts and techniques of body tracking in VR. (CO3, K4)

19. (a) Write short note on augmented Reality with example. (CO4, K3)

Or

(b) Brief explain about major issues in AR application development. (CO4, K3)

20. (a) Describe about frameworks of software and development tools in VR. (CO5, K5)

Or

(b) List out and explain about application of VR in Digital entertainment. (CO5, K5)

———————