| R7715 | Sub. Code |
|---|---|
| | 546101 |

**M.Sc. (IT) DEGREE EXAMINATION, NOVEMBER – 2022**

**First Semester**

**Information Technology**

**MATHEMATICS FOR COMPUTING**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

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

Answer **all** questions.

1. The inverse of $p \rightarrow q$ is the proposition of ————————.

   (a) $\neg p \rightarrow \neg q$

   (b) $\neg q \rightarrow \neg p$

   (c) $q \rightarrow p$

   (d) $\neg q \rightarrow p$

2. A compound proposition that is neither a tautology nor a contradiction is called a ————————

   (a) Contingency

   (b) Equivalence

   (c) Condition

   (d) Inference

3. Two sets are called disjoint if their _____ is the empty set.

(a) Union

(b) Difference

(c) Intersection

(d) Complement

4. Let set $A = \{1, 2\}$ and $C$ be $\{3, 4\}$ then $A \times B$ (Cartesian product of set $A$ and $B$) is?

(a) $\{1, 2, 3, 4\}$

(b) $\{(1,3), (2,4)\}$

(c) $\{(1,3), (2,4), (1,4), (2,3)\}$

(d) $\{(3,1), (4,1)\}$

5. The least number of computers required to connect 10 computers to 5 routers to guarantee 5 computers can directly access 5 routers is _____

(a) 74

(b) 104

(c) 30

(d) 67

6. Calculate the value of ${}^{8}C_{5}$.

(a) 79 (b) 43

(c) 120 (d) 56

7. Discrete probability distribution depends on the properties of_____

(a) data

(b) machine

(c) discrete variables

(d) probability function

8. A random variable X can take only two values, 2 and 4 i.e., $P(2) = 0.45$ and $P(4) = 0.97$. What is the Expected value of X?

(a) 3.8 (b) 2.9

(c) 4.78 (d) 5.32

9. In a 7-node directed cyclic graph, the number of Hamiltonian cycle is to be _____

(a) 728 (b) 450

(c) 360 (d) 260

10. Every Isomorphic graph must have _____ representation.

(a) cyclic

(b) adjacency list

(c) tree

(d) adjacency matrix

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

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

11. (a) Construct the truth table for the following formula $(Q \wedge (P \rightarrow Q)) \rightarrow P$.

Or

(b) Show that the following are equivalent formulas.

(i) $P \vee (P \wedge Q) \Leftrightarrow P$

(ii) $P \vee (\neg P \wedge Q) \Leftrightarrow P \vee Q$

12. (a) Let $A$ be a finite set and $P(A)$ be its power set. Let "$\subseteq$" be the inclusion relation on $P(A)$. Draw Hasse diagrams of $<P(A), \subseteq>$ for

(i) $A = \{a, b, c\}$

(ii) $\{a, b, c, d\}$

Or

(b) Prove that Theorem ro show that the set $R$ of real numbers is not denumerable.

13. (a) Prove $\binom{17}{6} = \binom{16}{5} + \binom{16}{6}$.

Or

(b) Find the coefficients of $x^4y^5$ in the expansion of $(2x - 3y)^9$.

14. (a) Calculate coefficient of correlation from the following data.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $X$: | 12 | 9 | 8 | 10 | 11 | 13 | 7 |
| $Y$: | 14 | 8 | 6 | 9 | 11 | 12 | 3 |

Or

(b) A discrete random variable $X$ has the mean 6 and variance 2. If it is assumed that the distribution is binomial, find $P(5 \leq X \leq 7)$.

15. (a) Prove that in any graph $G$, there is an even number of odd vertices.

Or

(b) Prove that a vertex $V$ of a tree $T$ is a cut vertex iff $d(v) > 1$.

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

Answer any **five** questions.

16. Find the disjunctive norm form of $(Q \vee (P \wedge Q)) \wedge \neg(P \vee R) \wedge Q$.

17. Justify $(Q \vee R) \rightarrow (P \wedge (\neg R))$ is tautology or not.

18. Show that $(A \cap B) \cup C = A \cap (B \cup C)$ if and only if $C \subseteq A$.

19. Define Cartesian Product of sets. Prove that $A \times (B \times C) \neq (A \times B) \times C$.

20. 6 boys and 6 girls are to be seated in a row, how many ways can they be seated if

(a) All boys are to be seated together and all girls are to seated together

(b) No Two Girls should be seated together.

(c) Boys occupy extreme positions.

21. A random variable X has the following probability functions:

| | | | | | | |
|---|---|---|---|---|---|---|
| $x_i$ | : | –2 | –1 | 0 | 1 | 2 | 3 |
| $P_i = p(x_i)$ | : | 0.1 | k | 0.2 | 2k | 0.3 | k |

Find (a) Variance (b) $p\ (x \geq 2)$.

22. If $G$ is a simple graph with $n$ vertices, where $n > 3$, and the degree $d(v) > n / 2$ for every vertex $v$ of $G$, then show that $G$ is Hamiltonian.

23. Let $G$ be a nonempty graph with at least two vertices. Prove that $G$ is bipartite if and only if, it has no odd cycles.

———————

| R7716 | Sub. Code |
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| | 546102 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022**

**First Semester**

**Information Technology**

**DISTRIBUTED OPERATING SYSTEM**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

All questions carry equal marks.

1. The nodes in the distributed systems can be arranged in the form of ————————.
   (a) Client/server systems
   (b) Peer to peer systems
   (c) Both A and B
   (d) None of the above

2. In which system, tasks are equally divided between all the nodes?
   (a) Client/server systems
   (b) Peer to peer systems
   (c) User to client system
   (d) All of the above

3. Which of the following is not an advantages of distributed systems?
   (a) All the nodes in the distributed system are connected to each other
   (b) It can be scaled as required
   (c) Failure of one node does not lead to the failure of the entire distributed system
   (d) Some messages and data can be lost in the network while moving from one node to another.

4. In distributed system, each processor has its own ————————.

(a) local memory
(b) clock
(c) Both A and B
(d) None of the above

5. In which state, processor executes its instructions?

(a) Ready (b) Waiting
(c) Running (d) Start

6. If one site fails in distributed system then ————————.

(a) the remaining sites can continue operating
(b) all the sites will stop working
(c) directly connected sites will stop working
(d) none of the mentioned

7. What are the characteristics of processor in distributed system?

(a) They vary in size and function
(b) They are same in size and function
(c) They are manufactured with single purpose
(d) They are real-time devices

8. What are the advantages of file replication?

(a) Improves availability and performance
(b) Decreases performance
(c) They are consistent
(d) Improves speed

9. DFC stands for ————————.

(a) Defragment File System
(b) Distributed File System
(c) Deadlock File System
(d) Data File standard

10. RPC stands for ————————.

(a) Remote Procedure Call

(b) Remote Printer Call

(c) Both (a) and (b)

(d) Random procedure call

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

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

All questions carry equal marks and each answer should not exceed 1 page or 250 words.

11. (a) Discuss about design issues of distributed systems.

Or

(b) Write short notes on: Client Server Model.

12. (a) Discuss briefly on: Atomic Transactions.

Or

(b) Write Short Notes on: Threads.

13. (a) Discuss about features of Distributed File Systems.

Or

(b) Write about Trends in Distributed File System.

14. (a) Write Short Notes on: Structure of Shared Memory Space and Thrashing.

Or

(b) Discuss about Switched Multiprocesors.

15. (a) Discuss briefly on: Architecture of distributed Web-Based Systems.

Or

(b) Write short notes on: Java RMI.

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

Answer any **five** questions.

All questions carry equal marks and each answer should not exceed 2 pages.

16. Explain about Hardware and Software concepts of distributed systems.

17. Discuss in detail, SUN RPC.

18. Explain about Deadlock in Distributed Systems.

19. Describe about fault Tolerance in Distributed Systems.

20. Explain the File Service Interface and Directory Service Interface in System Design.

21. Explain the Design and Implementation Issues of Distributed shared Memory.

22. Discuss in detail, Web Proxy Caching and Replication of Web Applications.

23. Explain about Security Management in Distributed OS.

———————

| R7717 | Sub. Code |
|---|---|
| | 546103 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022**

**First Semester**

**Information Technology**

**WEB TECHNOLOGY**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

All questions carry equal marks.

1. The Latest HTML standard is ————————.
   (a) HTML 4.0 (b) HTML 5.0
   (c) HTML 6.0 (d) HTML 7.0

2. CSS stands for ————————.
   (a) Cascading Style sheets
   (b) Creative Style Slides
   (c) Common style sheets
   (d) Cascading Specific Sheets

3. Which of the following is used for concatenation in PHP?
   (a) + (plus)
   (b) * (Asterisk)
   (c) . (dot)
   (d) appent()

4. PHP stands for ————————.

(a) Hypertext Preprocessor

(b) Pretext Hypertext Preprocessor

(c) Personal Home Preprocessor

(d) Page Hybrid Preprocessor

5. Which loop evaluates the condition expression as Boolean, If it is true, it executes the statements and when it is false it will terminates?

(a) For (b) For each

(c) While (d) If

6. All variables in PHP are denoted by ————————.

(a) Dollar sign $ (b) Hash sign #

(c) Asterisk sign * (d) Percent sign %

7. The arrays that can store their values in association with unique keys or indices are called ————————.

(a) Associative arrays

(b) Key based arrays

(c) Indices based arrays

(d) All of them

8. Unlike vector arrays of C and C++, the PHP arrays can store ————————.

(a) Same type of data

(b) Varied types of data

(c) Small amount of data

(d) Large amount of data

9. Any string can be broken up into an array by using

(a) file() Function (b) explode() function

(c) xplode() function (d) both (a) and (b)

10. Rmdir is used for

(a) Removing files directory

(b) Removing empty directory

(c) Removing old directories

(d) Reading files

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

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

All questions carry equal marks and each answer should not exceed one page or 250 words.

11. (a) Discuss about Video and Audio in HTML 5.

Or

(b) Write about Document Object Model.

12. (a) Discuss about Working of PHP with Web Server.

Or

(b) What are the data types in PHP? Explain their usage with examples.

13. (a) Discuss the usage of "switch" statement in PHP with example.

Or

(b) Discuss the purpose of break and continue statements with examples in PHP.

14. (a) How to handle Single and Multidimensional Arrays in PHP? Explain with examples.

Or

(b) Write about Date and Time functions in PHP with examples.

15. (a) Discuss about File Operations in PHP with examples.

Or

(b) How to Combine HTML and PHP? Explain with example.

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

Answer any **five** questions.

All questions carry equal marks and each answer should not exceed 2 pages.

16. Describe about Web Storage and Geolocation in HTML 5.

17. Discuss in detail, Designing and Implementing CSS3.

18. Explain about String Manipulation in PHP with suitable examples.

19. Describe the use of while, do while and for statements with examples in PHP.

20. Explain about Sorting Associative Arrays in PHP with example.

21. Explain how to pass arguments to a function by value and by reference, with examples.

22. Discuss in detail, Working with Forms with PHP.

23. Describe the following in PHP with examples:

(a) Redirecting the user

(b) File upload and scripts

———————

| R7718 | Sub. Code |
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**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022**

**First Semester**

**Information Technology**

**PYTHON PROGRAMMING**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

All questions carry equal marks.

1. Which of the following is the correct extension of the Python file?

   (a) .python (b) .pl

   (c) .py (d) .p

2. What will be the value of the following Python expression?

   4 + 3 % 5

   (a) 7 (b) 2

   (c) 4 (d) 1

3. What will be the output for the following code?

   str = “This is fun”

   str = str[5]

   print(str)

   (a) i (b) ‘ ‘

   (c) is fun (d) This is fun

4. Consider the code below. Line I is called

```
def printWeather( ):
print(" It is sunny!")
```

(a) the function body

(b) the function definition

(c) the function footer

(d) the function header

5. Study the following program :

```
mytuplel = (2, 4, 3)
 mytuple3 = mytuplel * 2
print(mytuple3)
```

What will be the output of this program?

(a) (2, 4, 3, 2, 4, 3) (b) (2, 2, 4, 4, 3, 3)

(c) (4, 8, 6) (d) Error

6. What is the output of the following set operation?

```
set1 = {"Yellow", "Orange", "Black"}
set2= {"Orange", "Blue", Pinki
set3 = set2.difference(set1)
print(set3)
```

(a) {'Yellow', "Black', 'Pink', 'Blue'}

(b) {'Pink', 'Blue'}

(c) {'Yellow', "Black'}

(d) {'Pink', 'Yellow'}

7. Which of the following is not used as loop in Python?

(a) for loop (b) while loop

(c) do-while loop (d) while loop with else

8. In a Python program, a control structure

(a) defines program-specific data structures

(b) manages the input and output of control characters

(c) directs the order of execution of the statements in the program

(d) dictates what happens before the program starts and after it terminates

9. The ———— method sets and returns the current file position in a file stream.

(a) seek( ) (b) tell( )

(c) return( ) (d) currentfp( )

10. When an error occurs during the execution of a program, an exception is said to have been ————

(a) Asserted (b) Created

(c) Raised (d) Triggered

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

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

All questions carry equal marks and each answer should not exceed 1 page or 250 words.

11. (a) Write short notes on: Features of Python.

Or

(b) Discuss in detail, Built-in Data Types of Python.

12. (a) Write a Python Program to Reverses a given string.

Or

(b) Write short notes on : Pass by Reference Vs Pass by Value in functions.

13. (a) What are Tuples? How to create Tuples in Python? Explain with example.

Or

(b) Write about Creating the Dictionary and Accessing the Dictionary Values.

14. (a) Write a Python Program to illustrate the use of if-elif-else statement.

Or

(b) Discuss the use of continue and pass statements in Python with examples.

15. (a) Discuss briefly about File Built-in Attributes.

Or

(b) How to detect and handle Exceptions in Python? Give examples.

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

Answer any **five** questions.

All questions carry equal marks and each answer should not exceed 2 pages.

16. Explain about the usage of Constructor in Python with an example program.

17. Explain the use of any eight String Methods with examples.

18. Write a Python Program to find the value of Binomial Coefficient using functions.

Hint: nCr= n!/ ((n–r)!*r!)]

19. What are the Characteristics of List? Explain List Indexing and Splitting with examples.

20. Describe the usage of any eight Set Methods in Python with suitable illustrations.

21. Write a Python Program to arrange the given numbers in Ascending Order.

22. Discuss in detail, File Built-in Methods in Python with examples.

23. Explain about Standard Exceptions in Python with examples.

———————

| R7719 | Sub. Code |
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| | 546501 |

**M.Sc. DEGREE EXAMINATION, NOVEMBER – 2022**

**First Semester**

**Information Technology**

**OBJECT ORIENTED SOFTWARE ENGINEERING**

**(CBCS – 2022 onwards)**

Time : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

1. ———————— of function oriented design model how functions are decomposed into sub-functions using graphical structure charts.

   (a) data-flow design

   (b) structural decomposition

   (c) system structuring

   (d) detailed design description

2. How many views of the software can be represented through the Unified Modeling Language (UML)?

   (a) Four (b) Five

   (c) Nine (d) None of the above

3. In the ———————— phase the design model is built based on the analysis model.

   (a) System Design (b) Application

   (c) Object design (d) Analysis

4. ———————— is the process that group's data and procedures into an entity called objects.

(a) Object development methodology

(b) Linear programming

(c) Structured programming

(d) Object oriented system development

5. UML diagram that shows the interaction between users and system, is known as

(a) Activity diagram

(b) E-R diagram

(c) Use case diagram

(d) Class diagram

6. ———————— relationship hides the internal details of the super-class from the subclasses.

(a) Interface (b) Inheritance

(c) Part of Class (d) One too many

7. A prototype that provides only the model of the UI is a

(a) Horizontal prototype

(b) Vertical prototype

(c) Visual prototyping

(d) Rapid prototyping

8. ———————— the implementation of a high-level operation for a specific class of objects.

(a) Method

(b) Message

(c) Polymorphism

(d) Object

9. Regression testing is primarily related to

(a) Maintenance Testing

(b) Dataflow Testing

(c) Developing Testing

(d) Functional Testing

10. Basic path testing falls under

(a) Unit Testing

(b) White Box Testing

(c) System Testing

(d) Block Box Testing

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

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

11. (a) What is the difference between task and activity?

Or

(b) Explain the Project Organization Concepts.

12. (a) Explain the Non-functional Requirements.

Or

(b) Discuss about Mapping Use Case to Objects with Sequence Diagrams.

13. (a) Explain the three types of Architectural styles in system design.

Or

(b) Discuss about Mapping Subsystem to Processors and Components.

14. (a) Explain the encapsulating data stores with bridge pattern.

Or

(b) Write about Identifying Missing Attributes and Operations.

15. (a) Explain about Optimization of Object Design Model.

Or

(b) Explain about the Unit Testing.

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

Answer any **five** questions.

16. Explain about the Project Communication Concepts.

17. Write shorts notes on managing analysis:
    (a) Communication about analysis
    (b) Iteration over the analysis model
    (c) Client sign off.

18. Explain System Design Activities: From Objects to Subsystems.

19. Write short notes on following class and types:
    (a) Class implementer, Class Extender and Class User
    (b) Types, Signature and Visibility

20. Explain Types of transformation in mapping concepts.

21. Explain the Analysis concepts of Entity, Boundary, and Control Objects.

22. Explain about the testing concepts.

23. Illustrate about the UML Modeling Concepts.