



Hemchandracharya North Gujarat University PHD Exam

Exam Name : HNGU_PHD_Computer Science_30.01.2024_09.30 AM TO 11:30 AM

Exam Date : 2024-01-30

Exam Time : 09:30:00 AM To 11:30:00 AM

Total Marks : 100

Note : The correct answer is indicated by the green color. સાચો જવાબ લીલા રંગ દ્વારા સૂચવવામાં આવે છે.

Question List:

Section: Section-A

- What does CPU stand for? [1 Mark]
 - **Central Processing Unit**
 - Computer Processing Unit
 - Central Printing Unit
 - Computer printing Unit
- What does "CSV" stand for in the context of data entry and storage? [1 Mark]
 - **Comma Separated Values**
 - Centralized Storage Value
 - Computer System Validation
 - Concurrent Sequential Values
- What does RAM stand for in the context of computers? [1 Mark]
 - **Random Access Memory**
 - Read-Only Memory
 - Rapid Access Memory
 - Remote Access Memory
- Which software application is commonly used for creating and editing spreadsheets? [1 Mark]
 - Word
 - **Excel**
 - PowerPoint
 - Outlook
- In computing, what does GUI stand for? [1 Mark]
 - **Graphical User Interface**
 - General User Interface
 - Global User Interface
 - Graphical Unifying Interface
- Which of the following is a correct sentence? [1 Mark]
 - She don't like coffee.

- He doesn't likes tea.
- They doesn't have a car.
- **I don't have a cat.**

• **Choose the correct spelling [1 Mark]**

- Accommodation
- Accomodation
- **Accommodation**
- Acomodation

• **What is the correct usage of "their" in a sentence? [1 Mark]**

- They're going to the store.
- There is a cat over here.
- **Their cat is black.**
- They're is a common contraction.

• **Which sentence is grammatically correct? [1 Mark]**

- Me and my friend are going to the movies
- **My friend and I are going to the movies**
- Me is going to the movies with my friend.
- My friend and me are going to the movies.

• **the correct usage of the word "effect" in a sentence: [1 Mark]**

- The new law will have a positive affect on the economy.
- The medication had an immediate affect.
- **The rain had no affect on the outdoor event.**
- The movie had a powerful affect on the audience.

• **If every triangle is a polygon and some polygons have four sides, which of the following statements is true? [1 Mark]**

- Every triangle has four sides
- Some triangles have four sides
- **No triangles have four sides.**
- All polygons have three sides.

• **If CAT is coded as 312, how is DOG coded? [1 Mark]**

- 415
- **513**
- 214
- 612

• **In a certain code, "PHD" is written as "KMG." How is "RESEARCH" written in that code? [1 Mark]**

- QCFXMPBE
- **QCFVXMPB**
- QCFVXOBP
- QCFVXPBM

• **Arrange the following words in alphabetical order: Experiment, Analysis, Data, Conclusion. [1 Mark]**

- **Analysis, Conclusion, Data, Experiment**
- Conclusion, Data, Experiment, Analysis
- Analysis, Data, Conclusion, Experiment
- Conclusion, Experiment, Analysis, Data

• **If every rose is a flower and some flowers fade quickly, which of the following statements is true? [1 Mark]**

- Every rose fades quickly.
- **Some roses fade quickly.**
- No roses fade quickly.
- Flowers never fade quickly.

- **What is the primary goal of basic research? [1 Mark]**
 - To solve immediate practical problems
 - **To generate new knowledge and understanding**
 - To develop new technologies
 - To make a profit

- **Which of the following is a characteristic of scientific research? [1 Mark]**
 - Subjectivity
 - Lack of systematic inquiry
 - **Reproducibility**
 - Bias

- **What are the essential steps in the research process? [1 Mark]**
 - Data analysis, hypothesis testing, conclusion
 - Literature review, data collection, report writing
 - **Formulating a research question, hypothesis, data collection, analysis, interpretation**
 - Observation, experimentation, theory development

- **What distinguishes applied research from basic research? [1 Mark]**
 - Applied research is more theoretical
 - Basic research focuses on practical applications
 - **Applied research aims to solve immediate problems**
 - Basic research is industry-oriented

- **What is the purpose of experimental design in research? [1 Mark]**
 - To confuse participants
 - To ensure random sampling
 - **To control variables and establish causation**
 - To create a complex study design

- **What is the purpose of setting up objectives in a research study? [1 Mark]**
 - To confuse researchers
 - **To provide a roadmap for the study**
 - To ensure statistical significance
 - To hide the study's purpose

- **What is the null hypothesis in hypothesis testing? [1 Mark]**
 - A hypothesis that is never tested
 - The hypothesis being tested for statistical significance
 - **A statement of no effect or no difference**
 - A hypothesis with a high level of significance

- **What does the level of significance represent in hypothesis testing? [1 Mark]**
 - **The probability of rejecting a true null hypothesis**
 - The probability of accepting a false null hypothesis
 - The confidence interval
 - The power of the test

- **Which statistical test is used for categorical data and expected vs. observed frequencies? [1 Mark]**
 - t-test
 - ANOVA
 - **Chi-square test**
 - Regression analysis

- **What is the purpose of simple linear regression analysis? [1 Mark]**
 - To compare means of multiple groups
 - **To analyze relationships between two continuous variables**
 - To assess the effect of categorical variables
 - To test the difference between observed and expected frequencies

- **Which section of a research paper provides an overview of the entire study, including the research question and methodology? [1 Mark]**
 - Abstract
 - **Introduction**
 - Discussion
 - Conclusion

- **What is the purpose of a research proposal? [1 Mark]**
 - To report research findings
 - To summarize literature reviews
 - **To outline planned research activities**
 - To discuss limitations of a study

- **In a research paper, what is the primary function of the abstract? [1 Mark]**
 - To present detailed results
 - To introduce the author
 - **To summarize the study's key points**
 - To provide references

- **What is the primary purpose of a literature review in a research paper? [1 Mark]**
 - To discuss the limitations of the study
 - To present the author's opinions
 - **To provide background and context for the study**
 - To describe the study's methodology

- **What does the term "APA" refer to in the context of research writing? [1 Mark]**
 - **American Psychology Association**
 - Advanced Publication Authorship
 - Academic Paper Analysis
 - Authorship and Publication Assessment

- **What is the primary purpose of the acknowledgments section in a research report? [1 Mark]**
 - To criticize the work of others
 - **To thank those who contributed to the study**
 - To list statistical analyses
 - To present the study's limitations

- **What is the purpose of a thesis in academic research? [1 Mark]**
 - To summarize existing research
 - **To present new research findings**
 - To criticize other researchers
 - To advertise a conference

- **In scientific writing, what does "APA style" primarily guide the author in? [1 Mark]**
 - **Formatting and citation**
 - Language fluency
 - Experimental design
 - Statistical analysis

- **What is the primary goal of a conference report? [1 Mark]**
 - To review existing literature
 - **To present findings to a scientific community**
 - To critique other researchers' work
 - To summarize a book

- **What does the term "Abstract" refer to in the context of a research paper? [1 Mark]**
 - **A brief summary of the entire paper**
 - A section where the author expresses personal opinions
 - A detailed analysis of statistical results

- A section for thanking contributors
- **What does the "References" section of a research paper typically include? [1 Mark]**
 - Acknowledgments
 - A list of figures and tables
 - **Citations of sources used in the paper**
 - A summary of the study's key points
- **What is the purpose of the "Declaration" section in a research report? [1 Mark]**
 - To declare the author's opinions
 - **To declare conflicts of interest**
 - To declare the study's limitations
 - To declare the importance of the research
- **What is the purpose of a "Review Paper" in scientific literature? [1 Mark]**
 - To criticize other researchers' work
 - **To provide an overview and synthesis of existing research**
 - To present new research findings
 - To list statistical analyses
- **Which section of a research paper typically contains detailed explanations of the research methods? [1 Mark]**
 - Introduction
 - Discussion
 - **Methods**
 - Conclusion
- **What does "MCQ" stand for in the context of testing? [1 Mark]**
 - Multiple Character Question
 - Most Challenging Query
 - **Multiple Choice Question**
 - Main Conclusion Quotient
- **In a scientific presentation, what is the purpose of the "Conclusion" slide? [1 Mark]**
 - To introduce the research question
 - To provide an overview of the literature review
 - **To summarize key findings and implications**
 - To list statistical methods used
- **What is the primary purpose of the "List of Figures" section in a research report? [1 Mark]**
 - To present statistical analyses
 - To provide an overview of the literature
 - To acknowledge contributors
 - **To guide readers to visual elements in the document**
- **What is the primary purpose of the "Conference Report" in scientific writing? [1 Mark]**
 - To critique conference presentations
 - **To provide a summary of a scientific conference**
 - To discuss the limitations of a study
 - To present new research findings
- **In statistical terms, what does "ANOVA" stand for? [1 Mark]**
 - Analysis of Non-Variable Attributes
 - **Analysis of Variance**
 - Association of Variables and Attributes
 - Average Number of Variables Analyzed
- **What does the term "Thesis" refer to in academic writing? [1 Mark]**
 - A summary of a book
 - A detailed literature review

- **A document presenting original research**
 - A critique of existing research
- **What is the primary purpose of the "Summary" section in a research report? [1 Mark]**
 - To present detailed statistical analyses
 - **To summarize key findings and conclusions**
 - To acknowledge contributors
 - To provide an overview of the literature
- **What section of a document typically provides a structured outline of its contents? [1 Mark]**
 - Introduction
 - **Table of Contents**
 - Acknowledgments
 - Statistical Analyses
- **What is the purpose of a "Book Review" in scientific literature? [1 Mark]**
 - To present new research findings
 - To provide an overview and synthesis of existing research
 - To critique other researchers' work
 - **To summarize a book**
- **What does the term "IRB" stand for in the context of research? [1 Mark]**
 - **Institutional Review Board**
 - Independent Research Bureau
 - International Research Body
 - Investigative Review Bureau
- **In a scientific presentation, what is the purpose of the "Title Page" slide? [1 Mark]**
 - To list statistical analyses
 - To acknowledge contributors
 - To provide an overview of the literature
 - **To introduce the presentation and its title**

Section: Section-B

- **Which is a method of decomposing a sequential process into sub operations [1 Mark]**
 - **Pipeline**
 - CISC
 - RISC
 - Database
- **A data structure in which linear sequence is maintained by pointers is known as [1 Mark]**
 - Stack
 - **Linked List**
 - Queue
 - Tree
- **What is the worst case time for quick sort to sort an array of n elements? [1 Mark]**
 - $O(n)$
 - **$O(n^2)$**
 - $O(n \log n)$
 - $O(n*n)$
- **The inorder and preorder traversal of a binary tree are d b e a f c g and a b d e c f g, respectively. The postorder traversal of the binary tree is: [1 Mark]**
 - **d e b f g c a**
 - e d b g f c a
 - e d b f g c a
 - d e f g b c a

- What is the number of nodes in a full binary tree with depth 3? [1 Mark]
 - 5
 - 6
 - 7
 - 8

- Which is the pointer (General Name) associated with the availability list? [1 Mark]
 - TOP
 - REAR
 - FIRST
 - **AVAIL**

- Correct hierarchical relationship among context- free, right-linear, and context-sensitive language is [1 Mark]
 - context-sensitive \subset context-free \subset right-linear
 - context-free \subset right-linear \subset context-sensitive
 - right-linear \subset context-sensitive \subset context-free
 - **right-linear \subset context-free \subset context-sensitive**

- Unrestricted grammar is also called _____ Grammar [1 Mark]
 - Type 3
 - Type 2
 - Type 1
 - **Type 0**

- Which of the following statement is not true? [1 Mark]
 - Type 0 grammar is called unrestricted grammar
 - **Chomsky hierarchy define only one grammar**
 - Type 3 grammar is recognized by FA
 - All of these

- Which of the following derivations does a top-down parser use while parsing an input string? The input is assumed to be scanned in left to right order [1 Mark]
 - Leftmost derivation traced out in reverse
 - Rightmost derivation traced out in reverse
 - Rightmost derivation
 - **Leftmost derivation**

- There exists a Context free grammar such that: $X \rightarrow Xa$ is [1 Mark]
 - **Left Recursive Grammar**
 - Non Recursive Grammar
 - Right Recursive Grammar
 - None of these

- The worst complexity of branch and bound would be approximately equal to the Complexity of [1 Mark]
 - **Dynamic Programming**
 - Divide and Conquer
 - Greedy Approach
 - Breath First Search

- We use dynamic programming approach when [1 Mark]
 - **Global Optimum solution**
 - Greedy Approach is not working
 - Accurate result
 - we need fast results

- Which of the following sorting algorithms in its typical implementation gives best performance when applied on an array which is sorted or almost sorted [1 Mark]
 - Merge Sort

- **Insertion Sort**
- Selection Sort
- Heap Sort

• Which of the following is not a stable sorting algorithm ? [1 Mark]

- **Quick Sort**
- Selection Sort
- Merge Sort
- Counting Sort

• Consider the following two sequences : $X = \langle B, C, D, C, A, B, C \rangle$, and $Y = \langle C, A, D, B, C, B \rangle$ The length of longest common subsequence of X and Y is : [1 Mark]

- **4**
- 5
- 3
- 2

• Matrix Chain Multiplication has time complexity as [1 Mark]

- $O(n^4)$
- $O(n \log n)$
- $O(n^2)$
- **$O(n^3)$**

• Complexity of Breath First Search (BFS) is [1 Mark]

- $O(E)$
- $O(V^2)$
- **$O(V + E)$**
- $O(E^2)$

• Which of the following intuitive definition is true about LR(1) Grammar. [1 Mark]

- **For a grammar to be LR(1) it is sufficient that a left-to-right shift reduce parser be able to recognize handles of right-sentential form when they appear on the stack.**
- For a grammar to be LR(1) it is sufficient that a left-to-right shift reduce parser be able to recognize handles of left-sentential form when they appear on the stack.
- For a grammar to be LR(1) it is sufficient that a left-to-right shift reduce parser be able to recognize handles of left-sentential form or right-sentential form when they appear on the stack.
- All of these

• A language L satisfies the Pumping Lemma for regular languages, and also the Pumping Lemma for context-free languages. Which of the following statements about L is TRUE? [1 Mark]

- L is necessarily a regular language.
- L is necessarily a context-free language, but not necessarily a regular language.
- L is necessarily a non-regular language
- **None of these**

• The compound propositions p and q are called logically equivalent if _____ is a tautology. [1 Mark]

- **$p \leftrightarrow q$**
- $p \rightarrow q$
- $\neg(p \vee q)$
- $\neg p \vee \neg q$

• An index is clustered, if [1 Mark]

- It is on a set of fields that form a candidate key.
- It is on a set of fields that include the primary key.
- **The data records of the file are organized in the same order as the data entries of the index.**
- None of Above

• Which of the following statements are TRUE about an SQL query?

P : An SQL query can contain a HAVING clause even if it does not have a GROUP BY clause

Q : An SQL query can contain a HAVING clause only if it has a GROUP BY clause

R : All attributes used in the GROUP BY clause must appear in the SELECT clause

S : Not all attributes used in the GROUP BY clause need to appear in the SELECT clause [1 Mark]

- P and R
- **P and S**
- Q and R
- Q and S

- **Which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock? I. 2-phase locking II. Time-stamp ordering [1 Mark]**

- I only
- **II only**
- Both I and II
- Neither I nor II

- **Given the following statements:**

S1: A foreign key declaration can always be replaced by an equivalent check assertion in SQL.

S2: Given the table R(a,b,c) where a and b together form the primary key, the following is a valid table definition.

CREATE TABLE S (

a INTEGER,

d INTEGER,

e INTEGER,

PRIMARY KEY (d),

FOREIGN KEY (a) references R)

Which one of the following statements is CORRECT? [1 Mark]

- S1 is TRUE and S2 is FALSE.
- Both S1 and S2 are TRUE.
- S1 is FALSE and S2 is TRUE.
- **Both S1 and S2 are FALSE.**

- **Which of the following is the function of an AI agent? [1 Mark]**

- **To map the percept sequence to an action**
- To map the goal sequence to an action
- To work without direct interference from any external factor like humans
- To map the environment sequence to an action

- **In terms of the bias-variance decomposition, a 1-nearest neighbor classifier has _____ than a 3-nearest neighbor classifier. [1 Mark]**

- Higher bias
- Lower variance
- **Higher variance**
- All of the above mentioned

- **Which of the following can help to reduce overfitting in an SVM classifier? [1 Mark]**

- **Use of slack variables**
- High degree polynomial features
- Normalizing the data
- Setting a very low learning rate

- **Suppose we want to compute 10-Fold Cross-Validation error on 100 training examples. We need to compute error N1 times, and the Cross-Validation error is the average of the errors. To compute each error, we need to build a model with data of size N2, and test the model on the data of size N3. What are the appropriate numbers for N1, N2, N3? [1 Mark]**

- **N1 = 10, N2=90, N3=10**
- N1=1, N2=90, N3=10
- N1=10, N2=100, N3=10
- N1=10, N2=100, N3=100

- **K means, self organizing maps, hierarchical clustering are the examples of [1 Mark]**

- Supervised Learning

- **Unsupervised Learning**
 - Machine Learning
 - Deep Learning
- The concept derived from _____ level are propositional logic, tautology, predicate calculus, model, temporal logic. [1 Mark]
 - Cognition Level
 - **Logic Level**
 - Functional Level
 - All of the above
- Which of the following are not classification tasks? [1 Mark]
 - Find the gender of a person by analyzing his writing style
 - **Predict the price of a house based on floor area, number of rooms etc.**
 - Predict whether there will be abnormally heavy rainfall next year
 - Detect pneumonia from chest X ray images
- What does the term "overfitting" refer to in machine learning? [1 Mark]
 - **When a model performs well on the training data but poorly on new data**
 - When a model performs well on new data but poorly on the training data
 - When a model perfectly fits the training data
 - When a model is too simple to capture the underlying patterns
- For a function of two variable, boundary value analysis yields [1 Mark]
 - $4n + 3$ test cases
 - **$4n + 1$ test cases**
 - $n + 4$ test cases
 - $2n + 4$ test cases
- Which of the following is not a characteristic of software? [1 Mark]
 - Software does not wear out
 - Software is flexible
 - Software is not manufactured
 - **Software is always correct**
- White box testing, a software testing technique is sometimes called [1 Mark]
 - Graph Testing
 - Basic Path
 - **Glass box testing**
 - Dataflow
- Which one of the following is a functional requirement ? [1 Mark]
 - Maintainability
 - Portability
 - Testability
 - **None of the mentioned**
- Which one of the following is TRUE? [1 Mark]
 - The requirements document also describes how the requirements that are listed in the document are implemented efficiently.
 - Consistency and completeness of functional requirements are always achieved in practice.
 - **Prototyping is a method of requirements validation**
 - Requirements review is carried out to find the errors in system design
- Which of the following is not a HTML5 tag <>? [1 Mark]
 - < track >
 - < video >
 - **< slider >**
 - < source >

- Which of the following is not an attribute of the table tag? [1 Mark]
 - **target**
 - Cellpadding
 - Cellspacing
 - colspan
- function outer() { var x = 10; function inner() { console.log(x); } return inner; } var closureFunction = outer(); closureFunction(); What will be the output of the above given code snippet? [1 Mark]
 - **10**
 - 20
 - Undefined
 - referenceError
- What is the purpose of the z-index property in CSS? [1 Mark]
 - It sets the control order of flex items.
 - **It controls the stacking order of elements.**
 - It adjusts the opacity of an element.
 - It sets the spacing between elements.
- What is the purpose of the @media rule in CSS? [1 Mark]
 - It defines custom fonts for different screen sizes
 - It applies styles based on user interactions.
 - It allows the use of variables in CSS.
 - **It applies styles based on screen sizes and other media features.**
- Identify the most accurate statement about the application of XML [1 Mark]
 - XML must be used to product XML and HTML output.
 - XML cannot specify or contain presentation information.
 - **XML is used to describe hierarchically organized information.**
 - XML performs the conversion of information between different e business applications.
- Which one of the following memory is fastest [1 Mark]
 - Cache memory
 - **Register memory**
 - Main memory
 - Secondary memory
- Given below are two statements:
 Statement I: hardwired control unit can be optimized to produce fast mode of operation.
 Statement II: Indirect addressing mode needs two memory references to fetch the operand
 In the light of above statements, choose the correct answers from the options given below: [1 Mark]
 - **Both Statement I and II are true**
 - Both Statement I and II are false
 - Statement I is true and II is false
 - Statement I is false and II is true
- A non pipelined system takes 30ns to process a task. The same task can be processed in a four segment pipeline with a clock cycle of 10ns. Determine the speed up of the pipeline in 100 tasks [1 Mark]
 - 3
 - 4
 - 3.91
 - **2.91**
- The content of the accumulator after the execution of the following 8085 assembly language program, is MVI A, 35H MOV B, A STC CMC RAR XRA B [1 Mark]
 - 00H
 - 35H
 - EFH
 - **2FH**

- **A CPU handles interrupt by executing interrupt service subroutine [1 Mark]**
 - **By checking interrupt register after execution of each instruction**
 - By checking interrupt register at the end of each fetch cycle
 - Whenever an interrupt is registered
 - By checking interrupt register at regular time interval
- **What does the following piece of code do? for (int i = 0; i < n-1; i++) { for (int j = i+1; j < n; j++) { if((arr[i]==arr[j]) && (i != j)) { printf(“%d”,arr[i]); } } } [1 Mark]**
 - **Print the duplicate elements in the array**
 - Print the element with maximum frequency
 - Print the unique elements in the array
 - None of the mentioned