

Seat No.	
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PD - 16

Total No. of Pages : 14

Ph.d Entrance Examination March - April, 2026
Computer Application
Subject Code: 58844

Day and Date : Tuesday, 06-10-2026

Total Marks : 100

Time : 10.00 a.m. to 12.00 p.m.

Instructions :

- 1) All questions are compulsory.
 - 2) Each question carries 2 marks.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR answer sheet.
 - 5) Follow the instructions given on OMR Sheet.
 - 6) Rough work shall be done on the sheet provided at the end of question paper.
 - 7) Only non-programmable calculators are allowed.
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1. Which statement best describes research?

- A. Collection of facts without analysis
- B. A systematic investigation to generate or validate knowledge
- C. Preparation of theoretical notes only
- D. Personal opinion about a problem

2. Research conducted mainly to solve an immediate practical problem is called:

- A. Basic research
- B. Applied research
- C. Historical research
- D. Philosophical research

3. A study conducted when very little is known about a problem is generally:

- A. Exploratory research
- B. Descriptive research
- C. Experimental research
- D. Evaluative research

4. A researcher studies the characteristics of MBA students using a questionnaire without manipulating variables. Which design is most appropriate?
- A. Experimental
B. Descriptive
C. Historical
D. Quasi-experimental
5. Selecting every 10th customer from an ordered customer list is an example of:
- A. Systematic sampling
B. Convenience sampling
C. Purposive sampling
D. Cluster sampling
6. Dividing students into rural and urban groups and randomly selecting respondents from each group is:
- A. Cluster sampling
B. Stratified random sampling
C. Snowball sampling
D. Convenience sampling
7. A hypothesis is best described as:
- A. A proven fact
B. A tentative statement that can be empirically tested
C. A research report
D. A sampling frame
8. Which test is generally suitable for comparing the means of two independent groups?
- A. Chi-square test
B. Independent-samples t-test
C. Paired t-test
D. Pearson correlation

9. Which test is appropriate for comparing students' marks before and after the same training program?
- A. Paired-samples t-test
B. Independent t-test
C. Chi-square test
D. One-way ANOVA
10. A researcher compares the average performance of students taught by three different methods. Which test is most appropriate?
- A. Paired t-test
B. One-way ANOVA
C. Chi-square test
D. Pearson correlation.
11. The main purpose of a literature review is to:
- A. Copy previous research
B. Identify existing knowledge and research gaps
C. Avoid data collection
D. Replace the methodology
12. Which section of a research report explains how data were collected and analyzed?
- A. Introduction
B. Methodology
C. Findings
D. Conclusion
13. A researcher wants to determine whether a new algorithm improves processing time while controlling for differences in computer hardware. Which design feature is most important?
- A. Random assignment or blocking to control hardware effects
B. Convenience sampling only
C. Increasing the literature review
D. Using descriptive statistics alone

14. A researcher first conducts interviews to identify factors affecting adoption of a banking app and then develops a questionnaire based on those findings. This is best classified as:
- A. Convergent mixed methods
 - B. Exploratory sequential mixed methods
 - C. Explanatory sequential mixed methods
 - D. Pure experimental research
15. A population consists of 60% undergraduate and 40% postgraduate students. A sample is required that preserves these proportions. Which method is most appropriate?
- A. Simple random sampling without strata
 - B. Proportionate stratified random sampling
 - C. Snowball sampling
 - D. Convenience sampling
16. A sampling frame excludes students who are studying remotely. The researcher then randomly selects students from the incomplete frame. The major problem is:
- A. Type I error
 - B. Coverage error and sampling bias
 - C. Measurement reliability
 - D. Internal consistency
17. What is the primary purpose of citation in a research report?
- A) To increase number of pages
 - B) To acknowledge source of information
 - C) To make the report attractive
 - D) To replace the literature review

22. A research study uses the same participants to evaluate an application under both cloud and on-premises environments. Which test is most suitable for comparing their mean response times?
- A. Independent-samples t-test
 - B. Paired-samples t-test
 - C. Chi-square test
 - D. One-way ANOVA with unrelated groups
23. A regression model predicts sales using advertising expenditure, price, and competitor activity. Which issue should the researcher examine if two predictors are highly correlated?
- A. Multicollinearity
 - B. Sampling frame
 - C. Type I error only
 - D. Content validity only
24. A research report presents a significant result but does not explain the sample, measurement procedures, or statistical method used. Which principle is most seriously compromised?
- A. Methodological transparency and reproducibility
 - B. Convenience sampling
 - C. Descriptive research
 - D. Population validity only

25. A researcher investigates whether a machine-learning fraud-detection system reduces false-positive transactions compared with the existing system, using matched transaction sets. Which research area and design combination is most appropriate?
- A. Computer applications with comparative/experimental evaluation
 - B. Historical research with literary analysis
 - C. Purely philosophical research
 - D. Descriptive research without outcome comparison
26. Which of the following is a dynamically typed programming language where variables do not require explicit declaration?
- A) C
 - B) Python
 - C) C++
 - D) Java
27. In C programming, what is the output of applying the unary size of operator to a character array declared as `char arr[10];` on a standard system?
- A) 1 byte
 - B) 10 bytes
 - C) 4 bytes
 - D) 8 bytes
28. What is the primary role of the Program Counter (PC) in a CPU architecture?
- A) Storing arithmetic logic flags
 - B) Holding the memory address of the next instruction to execute
 - C) Handling I/O interrupts
 - D) Counting clock pulses

34. Which CSS box-model property controls the internal clearance between the content and its surrounding border?
- A) Margin
B) Padding
C) Outline
D) Border-spacing
35. Which linear data structure restricts insertion of elements to the rear end and deletion to the front end?
- A) Stack
B) Queue
C) Deque
D) Binary Tree
36. What is the average-case time complexity of searching an element in a balanced Binary Search Tree (BST)?
- A) $O(1)$
B) $O(\log n)$
C) $O(n)$
D) $O(n \log n)$
37. In the Apache Hadoop architecture, which daemon node is responsible for managing file system metadata in HDFS?
- A) DataNode
B) NameNode
C) NodeManager
D) TaskTracker
38. What is the primary characteristic of column-oriented NoSQL databases like Apache Cassandra and HBase?
- A) Fixed relational schema
B) High scalability for sparse and wide datasets
C) Support for multi-table SQL joins
D) Inability to run distributed nodes

39. In the OSI Reference Model, which layer is responsible for logical IP addressing and routing packets across networks?
A) Data Link Layer
B) Network Layer
C) Transport Layer
D) Session Layer
40. What type of testing focuses on validating system functionality without looking at the internal source code structure?
A) White-box testing
B) Black-box testing
C) Unit testing
D) Mutation testing
41. Which keyword is used in Java to inherit a class from a base class?
A) implements
B) extends
C) inherits
D) super
42. Which method in the Java Thread class is called to begin concurrent execution of that thread?
A) run()
B) start()
C) init()
D) execute()
43. In data analytics and machine learning, which performance metric represents the harmonic mean of Precision and Recall?
A) Accuracy
B) F1-Score
C) Mean Squared Error (MSE)
D) ROC-AUC
44. What is the standard term for a cyber attack where attackers intercept and potentially alter traffic between two communicating parties without their knowledge?
A) Phishing
B) Man-in-the-Middle (MITM)
C) Denial of Service (DoS)
D) SQL Injection

45. Which symmetric encryption standard was adopted by NIST to replace the older DES algorithm?
- A) RSA
B) AES
C) Diffie-Hellman
D) MD5
46. What type of entrepreneurship primarily focuses on creating social value and solving community challenges rather than maximizing shareholder profit?
- A) Intrapreneurship
B) Social Entrepreneurship
C) Corporate Entrepreneurship
D) Scalable Tech Startup
47. Which AI search algorithm guarantees finding the optimal path to a goal state using both the path cost $g(n)$ and an admissible heuristic $h(n)$?
- A) Depth-First Search (DFS)
B) Breadth-First Search (BFS)
C) A* Search
D) Hill Climbing
48. In fuzzy logic, what operation is represented by the algebraic maximum $\max(\mu_A(x), \mu_B(x))$ of two membership functions?
- A) Fuzzy Union
B) Fuzzy Intersection
C) Fuzzy Complement
D) Fuzzy Difference
49. In Java Enterprise/Web technology, which interface object in JDBC is pre-compiled to execute parameterized SQL queries efficiently?
- A) Statement
B) Prepared Statement
C) Result Set
D) Connection

50. What is the primary function of an actuator in an Internet of Things (IoT) ecosystem?

- A) Converting digital/electrical signals into physical actions
- B) Measuring physical quantities like temperature
- C) Providing wireless IP address allocation
- D) Encrypting sensor data packets



- Rough Work -

- Rough Work -