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PD - 29

Total No. of Pages : 12

Ph.d Entrance Examination March - April, 2026
COMPUTER SCIENCE AND ENGINEERING
(For M.E./M.Tech. Students)
Subject Code: 58748

Day and Date : Wednesday, 07-10-2026

Total Marks : 100

Time : 04.00 p.m. to 06.00 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.

SECTION A

Research Methodology (Q1-Q25) - 50 Marks

1. What is the primary academic motivation for conducting research?
(A) To obtain a research degree and contribute new knowledge
(B) To simply pass time
(C) To avoid other academic activities.
(D) To copy existing work
2. Research whose primary purpose is to add to existing knowledge without immediate practical application is called:
(A) Applied research
(B) Fundamental/Basic research
(C) Action research
(D) Operational research

3. Research aimed at solving an immediate practical problem is termed:
(A) Pure research (B) Applied research
(C) Conceptual research (D) Philosophical research
4. Which is typically the first step in the research process?
(A) Formulating the research problem (B) Collecting data
(C) Report writing (D) Testing hypothesis
5. A systematic study of existing literature related to a research problem is called:
(A) Sampling (B) Literature review
(C) Data processing (D) Hypothesis testing
6. A research design is basically:
(A) A statistical tool
(B) The conceptual blueprint within which research is conducted
(C) A type of questionnaire
(D) A sampling technique
7. Which of the following is NOT a feature of a good research design?
(A) Flexibility (B) Minimization of bias
(C) Ambiguity in objectives (D) Reliability
8. A design in which the researcher manipulates at least one variable under controlled conditions is called:
(A) Exploratory design (B) Experimental design
(C) Descriptive design (D) Diagnostic design

9. A design used to gather preliminary information to help define the problem is called:
- (A) Descriptive research design (B) Exploratory research design
(C) Causal research design (D) Experimental research design
10. Selecting a subset of individuals from a population to represent the whole is called:
- (A) Sampling (B) Tabulation
(C) Editing (D) Coding
11. Primary data are data that are:
- (A) Already published by someone else
(B) Collected afresh for the first time by the researcher
(C) Always secondary in nature
(D) Never reliable
12. Which of the following is a source of secondary data?
- (A) Interview schedule
(B) Government publications and reports
(C) Direct observation
(D) A freshly designed questionnaire
13. A schedule differs from a questionnaire mainly in that a schedule is:
- (A) Filled by the respondent without help
(B) Filled by the enumerator/researcher based on responses
(C) Never used in surveys
(D) Only used for secondary data

14. Which measurement scale merely classifies data into categories without any order?
- (A) Nominal scale (B) Ordinal scale
(C) Interval scale (D) Ratio scale
15. A scale with a true zero point that allows ratio comparisons is called:
- (A) Nominal scale (B) Ordinal scale
(C) Interval scale. (D) Ratio scale
16. A hypothesis is best described as:
- (A) A proven fact
(B) A tentative assumption/proposition to be tested
(C) A final conclusion of research
(D) A type of sampling method
17. The hypothesis that states there is no significant difference or relationship is called:
- (A) Alternative hypothesis (B) Null hypothesis
(C) Research hypothesis (D) Working hypothesis
18. Rejecting a true null hypothesis is known as:
- (A) Type I error (B) Type II error
(C) Standard error (D) Sampling error
19. Accepting a false null hypothesis is known as:
- (A) Type I error (B) Type II error
(C) Level of significance (D) Degrees of freedom

20. Which test is commonly used for hypotheses about categorical/qualitative data (goodness of fit)?
- (A) t-test (B) Chi-square test
(C) F-test (D) Z-test only
21. Interpretation in research refers to:
- (A) Collecting raw data
(B) Drawing meaning and conclusions from analyzed data
(C) Formatting the report cover page
(D) Selecting the sample
22. Which of the following is typically NOT part of a standard research report layout?
- (A) Preliminary pages (title, acknowledgements)
(B) Main text (introduction, results, discussion)
(C) End matter (references, appendices)
(D) Personal diary entries of the researcher
23. A numerical measure reflecting the average citations received by articles in a journal is called:
- (A) Impact factor (B) Sample size
(C) Standard deviation (D) p-value
24. Proper acknowledgement of another author's work/ideas in a paper is achieved through:
- (A) Ignoring the source (B) Citation
(C) Deletion of references (D) Paraphrasing without credit

25. The section of a research report that summarizes findings and their implications is the:

- (A) Bibliography
- (B) Conclusion/Discussion section
- (C) Appendix
- (D) Title page

SECTION B

(Q26 - Q50) - 50 Marks

26. A language that can be recognized by a Deterministic Finite Automaton (DFA) is called:
- (A) Context-free language (B) Regular language
(C) Recursively enumerable language (D) Context-sensitive language
27. The class of context-free language is not closed under
- (A) union (B) star
(C) repeated concatenation (D) intersection
28. Which automaton has memory in the form of an unbounded tape?
- (A) Finite automaton (B) Pushdown automaton
(C) Turing machine (D) Mealy machine
29. A problem for which no algorithm can exist to solve it for all inputs is called:
- (A) NP-complete problem (B) Undecidable problem
(C) Polynomial problem (D) Regular problem
30. In a system with 32 bit virtual addresses and 1KB page size, use of one level page tables for virtual to physical address translation is not practical because of
- A) The large number of internal fragmentation
B) The large number of external fragmentation
C) The large memory overhead in maintaining page tables
D) The large computational overhead in the translation process

31. The mechanism that allows a program to execute a procedure on a remote machine as if local is:
- (A) Remote Procedure Call (RPC) (B) Message Passing Interface only
(C) Shared memory (D) Semaphore
32. Converting procedure arguments into a message format for network transmission is called:
- (A) Marshaling (B) Scheduling
(C) Paging (D) Spooling
33. The worst-case time complexity of binary search on a sorted array of n elements is:
- (A) $O(n)$ (B) $O(\log n)$
(C) $O(n \log n)$ (D) $O(n^2)$
34. Which data structure uses the LIFO (Last In First Out) principle?
- (A) Queue (B) Stack
(C) Linked list (D) Graph
35. A binary tree in which every node has at most two children, used for efficient searching, is called:
- (A) Binary heap (B) Binary search tree
(C) Linked list (D) Stack
36. Solving a problem by breaking it into overlapping sub problems and storing results to avoid recomputation is:
- (A) Greedy method (B) Dynamic programming
(C) Backtracking (D) Divide and conquer only

37. A Distributed Database Management System (DDBMS) is characterized by:
- (A) Data stored on a single centralized server only
 - (B) Data distributed across multiple sites appearing as a single database
 - (C) No concurrency control
 - (D) Absence of query processing
38. Ensuring all sites in a distributed transaction commit or none do is achieved through:
- (A) Two-phase commit protocol
 - (B) Simple random sampling
 - (C) Data mining
 - (D) Indexing only
39. Data warehouse provides
- A) transaction responsiveness
 - B) storage, functionality responsiveness to queries
 - C) demand and supply responsiveness
 - D) storage of transactions
40. Spatial databases are primarily designed to store and query:
- (A) Data related to geometric/geographic space
 - (B) Only textual data
 - (C) Only numeric transaction data
 - (D) Only audio data
41. The DNS maps the IP address to
- A) a binary address as string
 - B) an alphanumeric address.
 - C) a hierarchy of domain names
 - D) a hexadecimal address

42. Which protocol is used for sending email messages from a client to a server?
- (A) SMTP (B) HTTP
(C) IMAP (D) DHCP
43. JavaScript used within a webpage for client-side scripting is an example of:
- (A) Object-based scripting for the web
(B) A database query language
(C) A network routing protocol
(D) A hardware description language
44. IPv6 addresses are how many bits in length?
- (A) 32 bits (B) 64 bits
(C) 128 bits (D) 256 bits
45. The main reason for transitioning from IPv4 to IPv6 was:
- (A) Exhaustion of the IPv4 address space
(B) IPv4 being too secure
(C) IPv4 having too many addresses
(D) IPv6 being older than IPv4
46. Encapsulating IPv6 packets within IPv4 packets for transition is called:
- (A) Tunneling (B) Subnetting
(C) Multicasting (D) Fragmentation only.
47. Which IPv6 protocol replaces ARP (Address Resolution Protocol) used in IPv4?
- (A) Neighbor Discovery Protocol (B) SMTP
(C) FTP (D) DHCP only

48. A parallel architecture in which a single instruction operates on multiple data elements simultaneously is called:
- (A) SISD (B) SIMD
(C) MISD (D) Sequential architecture
49. In pipeline processing, breaking instruction execution into overlapping stages is intended to:
- (A) Increase overall instruction throughput
(B) Decrease the number of registers
(C) Eliminate the need for a CPU
(D) Increase memory size only
50. Cache coherence in multiprocessor systems refers to:
- (A) Ensuring all processors see a consistent view of shared memory data
(B) The physical size of the cache memory
(C) The speed of the hard disk
(D) The number of network cables



- Rough Work -