

GATE (CS)

Sample Question Paper - 2026

Country: IN | Duration: 3 hours | Max Marks: 100 | Language: English

Negative Marking: Yes (-1/3) | Total Questions: 65 | QuizVerse AI Tutor

General Instructions:

1. This paper contains 65 questions across 2 section(s): Computer Science & IT, Engineering Mathematics.
2. Duration: 3 hours. Maximum marks: 100.
3. Negative marking: Yes (-1/3).
4. Read each question carefully before answering.

Section 1: Computer Science & IT (45 Questions)

Q1. Which sorting algorithm has best-case $O(n)$?

- (A) Quick Sort
- (B) Merge Sort
- (C) Insertion Sort
- (D) Heap Sort

Q2. In SQL, which keyword eliminates duplicates?

- (A) UNIQUE
- (B) DIFFERENT
- (C) REMOVE
- (D) DISTINCT

Q3. The number of edges in a complete graph with n vertices is:

- (A) $n-1$
- (B) $2n$
- (C) $n(n-1)/2$
- (D) n^2

Q4. Which scheduling algorithm may cause starvation?

- (A) SJF (non-preemptive)
- (B) Round Robin
- (C) FCFS
- (D) Priority Scheduling

Q5. In OOP, polymorphism allows:

- (A) No overriding
- (B) Multiple inheritance only
- (C) Same interface, different implementations
- (D) Single class only

Q6. In virtual memory, page replacement uses:

- (A) Binary search
- (B) Indexing
- (C) LRU, FIFO, Optimal
- (D) Hashing only

Q7. In a complete binary tree with n nodes, the height is:

- (A) $O(1)$
- (B) $O(n)$
- (C) $O(\log n)$
- (D) $O(\sqrt{n})$

Q8. The halting problem is:

- (A) Undecidable
- (B) Regular
- (C) Decidable
- (D) NP-complete

Q9. Mutex is used for:

- (A) Networking
- (B) Mutual exclusion
- (C) Caching
- (D) Memory management

Q10. Which data structure uses LIFO?

- (A) Queue
- (B) Stack
- (C) Array
- (D) Linked List

Q11. The time complexity of binary search is:

- (A) $O(n \log n)$
- (B) $O(n^2)$
- (C) $O(\log n)$
- (D) $O(n)$

Q12. Which data structure uses LIFO?

- (A) Queue
- (B) Stack
- (C) Array
- (D) Linked List

Q13. DNS resolves:

- (A) Port to service
- (B) IP to MAC
- (C) MAC to IP
- (D) Domain names to IP addresses

Q14. Which normal form eliminates transitive dependencies?

- (A) 2NF
- (B) BCNF
- (C) 3NF
- (D) 1NF

Q15. Which scheduling algorithm may cause starvation?

- (A) Priority Scheduling
- (B) Round Robin
- (C) SJF (non-preemptive)
- (D) FCFS

Q16. Which traversal visits root first?

- (A) Level order
- (B) Inorder
- (C) Postorder
- (D) Preorder

Q17. The subset sum problem is:

- (A) P
- (B) NP-complete
- (C) Undecidable
- (D) Regular

Q18. The three levels of data abstraction are:

- (A) Class, Object, Method
- (B) None of these
- (C) Low, Medium, High
- (D) Physical, Logical, View

Q19. In C, the size of int on a 64-bit system is typically:

- (A) 1 byte
- (B) 2 bytes
- (C) 8 bytes
- (D) 4 bytes

Q20. The subset sum problem is:

- (A) Undecidable
- (B) Regular
- (C) NP-complete
- (D) P

Q21. Paging eliminates:

- (A) Internal fragmentation
- (B) Neither
- (C) External fragmentation
- (D) Both

Q22. The three levels of data abstraction are:

- (A) Physical, Logical, View
- (B) Class, Object, Method
- (C) Low, Medium, High
- (D) None of these

Q23. The time complexity of binary search is:

- (A) $O(n)$
- (B) $O(n^2)$
- (C) $O(\log n)$
- (D) $O(n \log n)$

Q24. A language is regular if and only if it is accepted by:

- (A) LBA
- (B) Finite Automaton
- (C) PDA
- (D) Turing Machine

Q25. A semaphore is used for:

- (A) Process synchronization
- (B) Disk scheduling
- (C) File management
- (D) Memory allocation

Q26. The time complexity of binary search is:

- (A) $O(n)$
- (B) $O(n \log n)$
- (C) $O(n^2)$
- (D) $O(\log n)$

Q27. The purpose of NAT in networking is:

- (A) Error detection
- (B) Routing
- (C) Encryption
- (D) IP address translation

Q28. Which normal form eliminates transitive dependencies?

- (A) BCNF
- (B) 1NF
- (C) 2NF
- (D) 3NF

Q29. In OOP, polymorphism allows:

- (A) Single class only
- (B) Multiple inheritance only
- (C) No overriding
- (D) Same interface, different implementations

Q30. In a complete binary tree with n nodes, the height is:

- (A) $O(n)$
- (B) $O(\log n)$
- (C) $O(1)$
- (D) $O(\sqrt{n})$

Q31. Which scheduling algorithm may cause starvation?

- (A) Round Robin
- (B) FCFS
- (C) SJF (non-preemptive)
- (D) Priority Scheduling

Q32. Which scheduling algorithm may cause starvation?

- (A) Priority Scheduling
- (B) Round Robin
- (C) SJF (non-preemptive)
- (D) FCFS

Q33. The purpose of NAT in networking is:

- (A) Routing
- (B) Error detection
- (C) Encryption
- (D) IP address translation

Q34. TCP is a ____ protocol:

- (A) Broadcast
- (B) Stateless
- (C) Connectionless
- (D) Connection-oriented

Q35. In C, the size of int on a 64-bit system is typically:

- (A) 1 byte
- (B) 8 bytes
- (C) 4 bytes
- (D) 2 bytes

Q36. Dijkstra's algorithm does not work with:

- (A) Dense graphs
- (B) Negative edge weights
- (C) Sparse graphs
- (D) Undirected graphs

Q37. In C, the size of int on a 64-bit system is typically:

- (A) 1 byte
- (B) 4 bytes
- (C) 8 bytes
- (D) 2 bytes

Q38. The number of edges in a complete graph with n vertices is:

- (A) $n-1$
- (B) $n(n-1)/2$
- (C) n^2
- (D) $2n$

Q39. B+ tree is commonly used in:

- (A) Database indexing
- (B) Hashing
- (C) Graph traversal
- (D) Sorting

Q40. In virtual memory, page replacement uses:

- (A) Binary search
- (B) Indexing
- (C) Hashing only
- (D) LRU, FIFO, Optimal

Q41. In SQL, which keyword eliminates duplicates?

- (A) UNIQUE
- (B) DISTINCT
- (C) DIFFERENT
- (D) REMOVE

Q42. The number of edges in a complete graph with n vertices is:

- (A) n^2
- (B) $2n$
- (C) $n-1$
- (D) $n(n-1)/2$

Q43. Which sorting algorithm has best-case $O(n)$?

- (A) Heap Sort
- (B) Merge Sort
- (C) Insertion Sort
- (D) Quick Sort

Q44. The three levels of data abstraction are:

- (A) None of these
- (B) Physical, Logical, View
- (C) Low, Medium, High
- (D) Class, Object, Method

Q45. The three levels of data abstraction are:

- (A) None of these
- (B) Class, Object, Method
- (C) Physical, Logical, View
- (D) Low, Medium, High

Section 2: Engineering Mathematics (20 Questions)

Q46. The rank of the matrix $\begin{bmatrix} 1,2,3 \\ 4,5,6 \\ 7,11,11 \end{bmatrix}$ is:

- (A) 1
- (B) 2
- (C) 3
- (D) 0

Q47. The equation of tangent to $y = x^2$ at $x = 1$ is:

- (A) $y = 8x - 10$
- (B) $y = 6x - 12$
- (C) $y = 2x - 18$
- (D) $y = 2x - 8$

Q48. The value of integral $\sin^2(x) dx$ from 0 to $\pi/2$ is:

- (A) $7\pi/4$
- (B) $2\pi/8$
- (C) $15\pi/16$
- (D) $12\pi/4$

Q49. The mean of a binomial distribution with $n = 29$ and $p = 0.8$ is:

- (A) 28.4
- (B) 21.2
- (C) 11.1
- (D) 27.1

Q50. The probability of getting exactly 4 heads in 6 tosses of a fair coin is:

- (A) $24/128$
- (B) $25/256$
- (C) $33/64$
- (D) $9/128$

Q51. The eccentricity of the ellipse $x^2/6 + y^2/1 = 1$ is:

- (A) 0.41
- (B) 0.53
- (C) 0.73
- (D) 0.58

Q52. The equation of tangent to $y = x^2$ at $x = 1$ is:

- (A) $y = 8x - 10$
- (B) $y = 3x - 1$
- (C) $y = 12x - 13$
- (D) $y = 8x - 3$

Q53. The number of ways to arrange 3 distinct objects in a circle is:

- (A) 4780
- (B) 4720
- (C) 3264
- (D) 4483

Q54. If $z = 3 + 2i$, then $|z| =$

- (A) 8.84
- (B) 7.60
- (C) 6.37
- (D) 6.73

Q55. $\lim_{x \rightarrow 0} \sin(7x)/x =$

- (A) 3
- (B) 2
- (C) 1
- (D) 3

Q56. $\lim_{x \rightarrow 0} \sin(7x)/x =$

- (A) 4
- (B) 4
- (C) 2
- (D) 4

Q57. The probability of getting exactly 4 heads in 7 tosses of a fair coin is:

- (A) $5/128$
- (B) $35/32$
- (C) $48/256$
- (D) $41/128$

Q58. The number of ways to arrange 4 distinct objects in a circle is:

- (A) 1530
- (B) 2588
- (C) 505
- (D) 1702

Q59. The sum of first 41 terms of AP with $a = 5$, $d = 1$ is:

- (A) 3996
- (B) 4049
- (C) 161
- (D) 4098

Q60. The probability of getting exactly 4 heads in 8 tosses of a fair coin is:

- (A) $5/64$
- (B) $12/256$
- (C) $39/128$
- (D) $29/128$

Q61. The derivative of $x^2 \sin(x)$ at $x = \pi$ is:

- (A) 14.84
- (B) 5.21
- (C) 2.14
- (D) -3.62

Q62. The distance between parallel lines $3x + 2y = 6$ and $2x + 3y = 14$ is:

- (A) 2.19
- (B) 4.47
- (C) 1.10
- (D) 1.60

Q63. The area under $y = x^2$ from $x = 0$ to $x = 4$ is:

- (A) 30.0
- (B) 109.2
- (C) 18.4
- (D) 14.4

Q64. If $\det(A) = 3$ and A is 3×3 , then $\det(2A) =$

- (A) 49
- (B) 58
- (C) 4
- (D) 29

Q65. Integral of $(x^2 + 2) dx$ from 0 to 2 equals:

- (A) 29
- (B) 16
- (C) 51
- (D) 84

Answer Key

Q1: (C)	Q2: (D)	Q3: (C)	Q4: (D)	Q5: (C)
Q6: (C)	Q7: (C)	Q8: (A)	Q9: (B)	Q10: (B)
Q11: (C)	Q12: (B)	Q13: (D)	Q14: (C)	Q15: (A)
Q16: (D)	Q17: (B)	Q18: (D)	Q19: (D)	Q20: (C)
Q21: (C)	Q22: (A)	Q23: (C)	Q24: (B)	Q25: (A)
Q26: (D)	Q27: (D)	Q28: (D)	Q29: (D)	Q30: (B)
Q31: (D)	Q32: (A)	Q33: (D)	Q34: (D)	Q35: (C)
Q36: (B)	Q37: (B)	Q38: (B)	Q39: (A)	Q40: (D)
Q41: (B)	Q42: (D)	Q43: (C)	Q44: (B)	Q45: (C)
Q46: (B)	Q47: (A)	Q48: (B)	Q49: (A)	Q50: (A)
Q51: (B)	Q52: (C)	Q53: (C)	Q54: (B)	Q55: (A)
Q56: (A)	Q57: (A)	Q58: (D)	Q59: (D)	Q60: (B)
Q61: (C)	Q62: (D)	Q63: (A)	Q64: (A)	Q65: (D)

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