GATE (CS)

Sample Question Paper - 2025

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 data structure uses LIFO?

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

Q2. A language is regular if and only if it is accepted by:

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

Q3. In SQL, which keyword eliminates duplicates?

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

Q4. The time complexity of binary search is:

(A) O(log n)
(B) O(n log n)
(C) O(n^2)
(D) O(n)

Q5. Which scheduling algorithm may cause starvation?

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

Q6. The halting problem is:

(A) NP-complete

(B) Regular

(C) Decidable

(D) Undecidable

Q7. In SQL, which keyword eliminates duplicates?

(A) DISTINCT

(B) DIFFERENT

(C) REMOVE

(D) UNIQUE

Q8. The three levels of data abstraction are:

(A) Low, Medium, High

(B) Class, Object, Method

(C) None of these

(D) Physical, Logical, View

Q9. Which traversal visits root first?

(A) Preorder

(B) Postorder

(C) Level order

(D) Inorder

Q10. In C, the size of int on a 64-bit system is typically:

(A) 8 bytes

(B) 1 byte

(C) 4 bytes

(D) 2 bytes

Q11. Dijkstra's algorithm does not work with:

(A) Negative edge weights

(B) Undirected graphs

(C) Sparse graphs

(D) Dense graphs

Q12. Mutex is used for:

(A) Memory management

(B) Mutual exclusion

(C) Networking

(D) Caching

Q13. In virtual memory, page replacement uses:

(A) LRU, FIFO, Optimal

(B) Binary search

(C) Indexing

(D) Hashing only

Q14. In virtual memory, page replacement uses:

(A) Binary search

(B) LRU, FIFO, Optimal

(C) Hashing only

(D) Indexing

Q15. In SQL, which keyword eliminates duplicates?

(A) DIFFERENT

(B) UNIQUE

(C) DISTINCT

(D) REMOVE

Q16. In C, the size of int on a 64-bit system is typically:

(A) 4 bytes

(B) 8 bytes

(C) 2 bytes

(D) 1 byte

Q17. DNS resolves:

(A) Domain names to IP addresses

(B) MAC to IP

(C) IP to MAC

(D) Port to service

Q18. Which sorting algorithm has best-case O(n)?

(A) Heap Sort

(B) Merge Sort

(C) Quick Sort

(D) Insertion Sort

Q19. In SQL, which keyword eliminates duplicates?

(A) DISTINCT

(B) DIFFERENT

(C) REMOVE

(D) UNIQUE

Q20. The subset sum problem is:

(A) Undecidable

(B) P

(C) Regular

(D) NP-complete

Q21. DNS resolves:

(A) MAC to IP

(B) Port to service

(C) IP to MAC

(D) Domain names to IP addresses

Q22. A language is regular if and only if it is accepted by:

(A) LBA

(B) Turing Machine

(C) Finite Automaton

(D) PDA

Q23. The three levels of data abstraction are:

(A) Physical, Logical, View

(B) Class, Object, Method

(C) None of these

(D) Low, Medium, High

Q24. Which scheduling algorithm may cause starvation?

(A) SJF (non-preemptive)

(B) FCFS

(C) Round Robin

(D) Priority Scheduling

Q25. Paging eliminates:

(A) External fragmentation

(B) Internal fragmentation

(C) Neither

(D) Both

Q26. DNS resolves:

(A) Domain names to IP addresses

(B) MAC to IP

(C) Port to service

(D) IP to MAC

Q27. B+ tree is commonly used in:

(A) Hashing

(B) Graph traversal

(C) Sorting

(D) Database indexing

Q28. The three levels of data abstraction are:

(A) Low, Medium, High

(B) Physical, Logical, View

(C) Class, Object, Method

(D) None of these

Q29. The purpose of NAT in networking is:

(A) IP address translation

(B) Error detection

(C) Encryption

(D) Routing

Q30. TCP is a ____ protocol:

(A) Stateless

(B) Connectionless

(C) Connection-oriented

(D) Broadcast

Q31. In OOP, polymorphism allows:

(A) No overriding

(B) Single class only

(C) Same interface, different implementations

(D) Multiple inheritance only

Q32. The subset sum problem is:

(A) Regular

(B) Undecidable

(C) NP-complete

(D) P

Q33. A semaphore is used for:

(A) Disk scheduling

(B) Memory allocation

(C) Process synchronization

(D) File management

Q34. In a complete binary tree with n nodes, the height is:

(A) O(sqrt(n))

(B) O(log n)

(C) O(n)

(D) O(1)

Q35. Which layer of OSI handles routing?

(A) Physical

(B) Data Link

(C) Transport

(D) Network

Q36. In virtual memory, page replacement uses:

(A) Indexing

(B) Binary search

(C) Hashing only

(D) LRU, FIFO, Optimal

Q37. B+ tree is commonly used in:

(A) Hashing

(B) Database indexing

(C) Graph traversal

(D) Sorting

Q38. Which scheduling algorithm may cause starvation?

(A) Round Robin

(B) SJF (non-preemptive)

(C) Priority Scheduling

(D) FCFS

Q39. Which traversal visits root first?

(A) Postorder

(B) Level order

(C) Inorder

(D) Preorder

Q40. Which normal form eliminates transitive dependencies?

(A) 2NF

(B) BCNF

(C) 1NF

(D) 3NF

Q41. The number of edges in a complete graph with n vertices is:

(A) n(n-1)/2

(B) 2n

(C) n^2

(D) n-1

Q42. The halting problem is:

(A) Regular

(B) NP-complete

(C) Decidable

(D) Undecidable

Q43. Which layer of OSI handles routing?

(A) Transport

(B) Network

(C) Data Link

(D) Physical

Q44. Mutex is used for:

(A) Memory management

(B) Mutual exclusion

(C) Caching

(D) Networking

Q45. A language is regular if and only if it is accepted by:

(A) Turing Machine

(B) Finite Automaton

(C) PDA

(D) LBA

Section 2: Engineering Mathematics (20 Questions)

Q46. If det(A) = 7 and A is 3x3, then det(2A) =

(A) 84

(B) 46

(C) 2

(D) 47

Q47. The mean of a binomial distribution with n = 48 and p = 0.3 is:

(A) 28.9

(B) 15.9

(C) 32.3

(D) 33.3

Q48. The number of ways to arrange 4 distinct objects in a circle is:

(A) 4671

(B) 1459

(C) 315

(D) 3983

Q49. If z = 3 + 2i, then |z| =

(A) 6.73

(B) 6.37

(C) 7.60

(D) 8.84

Q50. lim(x->0) sin(7x)/x =

(A) 3

(B) 3

(C) 2

(D) 1

Q51. The area under y = x^3 from x = 0 to x = 4 is:

(A) 71.0

(B) 107.9

(C) 55.6

(D) 142.5

Q52. The area under y = x^2 from x = 0 to x = 4 is:

(A) 30.0

(B) 18.4

(C) 109.2

(D) 14.4

Q53. The value of integral sin^2(x) dx from 0 to pi/2 is:

(A) 2pi/8

(B) 7pi/4

(C) 12pi/4

(D) 15pi/16

Q54. The sum of first 24 terms of AP with a = 3, d = 4 is:

(A) 4128

(B) 784

(C) 4404

(D) 4396

Q55. The eccentricity of the ellipse x^2/22 + y^2/12 = 1 is:

(A) 0.59

(B) 0.59

(C) 0.44

(D) 0.36

Q56. The equation of tangent to y = x^2 at x = 1 is:

(A) y = 6x - 12

(B) y = 2x - 18

(C) y = 8x - 10

(D) y = 2x - 8

Q57. The equation of tangent to y = x^2 at x = 1 is:

(A) y = 5x - 11

(B) y = 2x - 5

(C) y = 6x - 7

(D) y = 4x - 4

Q58. The eccentricity of the ellipse x^2/6 + y^2/1 = 1 is:

(A) 0.41

(B) 0.53

(C) 0.58

(D) 0.73

Q59. If z = 4 + 4i, then |z| =

(A) 1.47

(B) 2.14

(C) 8.61

(D) 7.91

Q60. The probability of getting exactly 4 heads in 7 tosses of a fair coin is:

(A) 48/256

(B) 41/128

(C) 35/32

(D) 5/128

Q61. The derivative of x^5 sin(x) at x = pi is:

(A) -9.74

(B) -1.40

(C) 18.29

(D) 8.20

Q62. The equation of tangent to y = x^2 at x = 1 is:

(A) y = 8x - 10

(B) y = 8x - 3

(C) y = 3x - 1

(D) y = 12x - 13

Q63. Integral of (x^2 + 2) dx from 0 to 2 equals:

(A) 84

(B) 16

(C) 29

(D) 51

Q64. The sum of first 45 terms of AP with a = 5, d = 1 is:

(A) 1298

(B) 4110

(C) 1128

(D) 4754

Q65. The distance between parallel lines 3x + 2y = 6 and 2x + 3y = 14 is:

(A) 4.47

(B) 1.60

(C) 2.19

(D) 1.10

Answer Key

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