

ECAT

Engineering College Admission Test

COMPUTER SCIENCE

FULL MOCK PAPER

■ Total Questions	60 MCQs
■ Sections	6 (Fundamentals, Programming, OS, DB, Networking, Maths)
■ Time Allowed	120 Minutes
■ Total Marks	60 (1 mark each)
■ Negative Marking	None
■ Answer Key	Correct option highlighted in GREEN on every question

INSTRUCTIONS TO CANDIDATES

1. This paper contains 60 Multiple Choice Questions (MCQs) divided into 6 sections.
2. Each question carries ONE mark. There is NO negative marking.
3. Select the MOST appropriate answer for each question.
4. Correct answers are highlighted in GREEN for study and revision purposes.
5. Topics covered: Computer Organization, Programming (C/C++), Data Structures, Operating Systems, Databases, Computer Networks, and Discrete Mathematics.
6. Calculators are NOT permitted during the actual ECAT examination.

SECTION A — COMPUTER FUNDAMENTALS & ORGANIZATION

Q1. Which generation of computers used vacuum tubes?

- (A) Second
- (B) Third
- (C) First ✓**
- (D) Fourth

Q2. The binary number 1011 in decimal is:

- (A) 9
- (B) 10
- (C) 11 ✓**
- (D) 13

Q3. Which of the following is NOT a primary storage device?

- (A) RAM
- (B) ROM
- (C) Cache
- (D) Hard Disk ✓**

Q4. CPU stands for:

- (A) Central Processing Unit ✓**
- (B) Control Processing Unit
- (C) Central Program Utility
- (D) Computer Processing Unit

Q5. A nibble consists of how many bits?

- (A) 8
- (B) 4 ✓**
- (C) 16
- (D) 2

Q6. Which bus carries data between CPU and memory?

- (A) Address bus
- (B) Control bus
- (C) Data bus ✓**
- (D) System bus

Q7. The speed of a CPU is measured in:

- (A) Bytes
- (B) Hertz ✓**
- (C) Watts
- (D) MIPS

Q8. Which memory is volatile?

- (A) ROM
- (B) PROM
- (C) RAM ✓**
- (D) EPROM

Q9. BIOS is stored in:

- (A) RAM
- (B) Hard drive
- (C) ROM ✓**
- (D) Cache

Q10. The decimal equivalent of hexadecimal 'F' is:

- (A) 14
- (B) 15 ✓**
- (C) 16
- (D) 13

SECTION B — PROGRAMMING & ALGORITHMS**Q11. What is the time complexity of Binary Search?**

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

Q12. Which data structure uses LIFO principle?

- (A) Queue
- (B) Stack ✓**
- (C) Tree
- (D) Graph

Q13. In C++, which operator is used for dynamic memory allocation?

- (A) `malloc()`
- (B) `new` ✓**
- (C) `alloc()`
- (D) `create()`

Q14. A function that calls itself is called:

- (A) Iteration
- (B) Recursion ✓**
- (C) Loop
- (D) Subroutine

Q15. Which sorting algorithm has worst-case $O(n^2)$?

- (A) Merge Sort
- (B) Quick Sort ✓**
- (C) Heap Sort
- (D) Radix Sort

Q16. What does 'OOP' stand for?

(A) Object Oriented Programming ✓

(B) Object Oriented Protocol

(C) Ordered Object Processing

(D) None of these

Q17. Which keyword is used to define a class in C++?

(A) struct

(B) def

(C) class ✓

(D) object

Q18. An array index in C++ starts from:

(A) 1

(B) -1

(C) 0 ✓

(D) Depends on compiler

Q19. Which of the following is a linear data structure?

(A) Tree

(B) Graph

(C) Queue ✓

(D) Hash Table

Q20. The process of hiding internal details is called:

(A) Polymorphism

(B) Inheritance

(C) Encapsulation ✓

(D) Abstraction

SECTION C — OPERATING SYSTEMS**Q21. Which scheduling algorithm can cause starvation?**

- (A) Round Robin
- (B) FCFS
- (C) Priority Scheduling ✓**
- (D) SJF

Q22. A deadlock requires which of the following conditions?

- (A) Mutual Exclusion only
- (B) Hold and Wait only
- (C) All four Coffman conditions ✓**
- (D) No Preemption only

Q23. Virtual memory uses which concept to extend RAM?

- (A) Caching
- (B) Swapping / Paging ✓**
- (C) Buffering
- (D) Spooling

Q24. Which OS is open-source?

- (A) Windows 10
- (B) macOS
- (C) Linux ✓**
- (D) MS-DOS

Q25. The kernel of an OS is responsible for:

- (A) GUI rendering
- (B) Hardware resource management ✓**
- (C) Compiling programs
- (D) Network browsing

Q26. In Unix, which command lists directory contents?

- (A) dir
- (B) list
- (C) ls ✓**
- (D) show

Q27. Thrashing occurs when:

- (A) Too many processes are idle
- (B) CPU spends more time swapping than executing ✓**
- (C) Memory is too large
- (D) Disk is full

Q28. A process in the 'waiting' state is waiting for:

- (A) CPU allocation
- (B) I/O or event completion ✓**
- (C) Memory allocation
- (D) None of these

Q29. File permissions in Linux are represented by how many bits?

- (A) 8
- (B) 16
- (C) 9 ✓**
- (D) 12

Q30. Which system call creates a new process in Unix?

- (A) exec()
- (B) spawn()
- (C) fork() ✓**
- (D) create()

SECTION D — DATABASES**Q31. SQL stands for:****(A) Structured Query Language ✓**

(B) Simple Query Language

(C) Sequential Query Language

(D) Standard Query Language

Q32. A primary key must be:

(A) Nullable and unique

(B) Unique and not null ✓

(C) Duplicate allowed

(D) Any data type only

Q33. Which normal form eliminates partial dependencies?

(A) 1NF

(B) 2NF ✓

(C) 3NF

(D) BCNF

Q34. The SELECT statement in SQL is used to:

(A) Insert data

(B) Delete data

(C) Retrieve data ✓

(D) Update data

Q35. A foreign key references:

(A) Any column

(B) Primary key of another table ✓

(C) Index column

(D) Unique key of same table

Q36. Which SQL clause filters grouped results?

- (A) WHERE
- (B) ORDER BY
- (C) HAVING ✓**
- (D) GROUP BY

Q37. ACID properties belong to:

- (A) Networking
- (B) Database Transactions ✓**
- (C) Operating Systems
- (D) Programming

Q38. Which join returns all rows from both tables?

- (A) INNER JOIN
- (B) LEFT JOIN
- (C) RIGHT JOIN
- (D) FULL OUTER JOIN ✓**

Q39. ER diagram stands for:

- (A) Entity Relation
- (B) Entity Relationship ✓**
- (C) Event Record
- (D) None

Q40. Which command removes a table permanently in SQL?

- (A) DELETE
- (B) TRUNCATE
- (C) DROP ✓**
- (D) REMOVE

SECTION E — NETWORKING & INTERNET

Q41. IP address version 4 consists of how many bits?

- (A) 16
- (B) 32 ✓**
- (C) 64
- (D) 128

Q42. Which layer of OSI model handles routing?

- (A) Data Link
- (B) Transport
- (C) Network ✓**
- (D) Session

Q43. HTTP stands for:

- (A) HyperText Transfer Protocol ✓**
- (B) High Transfer Text Protocol
- (C) HyperText Transmission Protocol
- (D) None

Q44. Which device connects two different networks?

- (A) Switch
- (B) Hub
- (C) Router ✓**
- (D) Repeater

Q45. DNS is used to:

- (A) Assign IP addresses
- (B) Translate domain names to IP addresses ✓**
- (C) Encrypt data
- (D) Route packets

Q46. The default port for HTTPS is:

- (A) 80
- (B) 21
- (C) 443 ✓**
- (D) 25

Q47. Which protocol is used to send emails?

- (A) FTP
- (B) HTTP
- (C) SMTP ✓**
- (D) POP3

Q48. A subnet mask 255.255.255.0 means:

- (A) Class A
- (B) Class B
- (C) Class C ✓**
- (D) Class D

Q49. Wi-Fi is based on which IEEE standard?

- (A) 802.3
- (B) 802.11 ✓**
- (C) 802.5
- (D) 802.15

Q50. Which topology has a central hub?

- (A) Bus
- (B) Ring
- (C) Star ✓**
- (D) Mesh

SECTION F — MATHEMATICS FOR CS

Q51. The number of edges in a complete graph K_n is:

(A) 10 ✓

(B) 5

(C) 8

(D) 20

Q52. In Boolean algebra, $A + A'$ equals:

(A) 0

(B) A

(C) 1 ✓

(D) A'

Q53. The complement of $A \cap B$ is:

(A) $A' \cap B'$

(B) $A \cup B$

(C) $A' \cup B'$ ✓

(D) $A \cap B'$

Q54. How many rows does a truth table with 3 variables have?

(A) 6

(B) 8 ✓

(C) 4

(D) 16

Q55. $\log_2(64)$ equals:

(A) 8

(B) 4

(C) 6 ✓

(D) 5

Q56. Which of the following is a tautology?

(A) $A \wedge \neg A$

(B) $A \vee \neg A$ ✓

(C) $A \wedge B$

(D) $A \rightarrow B$

Q57. The modular arithmetic $17 \bmod 5$ equals:

(A) 3

(B) 2 ✓

(C) 4

(D) 1

Q58. A tree with n nodes has how many edges?

(A) n

(B) $n+1$

(C) $n-1$ ✓

(D) $2n$

Q59. Which of these is NOT a property of a group?

(A) Closure

(B) Associativity

(C) Commutativity ✓

(D) Identity

Q60. The value of $0!$ (zero factorial) is:

(A) 0

(B) Undefined

(C) 1 ✓

(D) Infinity