COMPUTER SCIENCE

Class XI - Mock Test Paper

Code No. 083

Time: 1 Hour **Maximum Marks: 300**

Grading Scheme: +4 for correct answer, -1 for incorrect answer

Author: Shuvam Banerji Seal

General Instructions:

- This question paper contains 75 questions.
- All questions are compulsory.
- Each question carries 4 marks for correct answer and -1 mark for incorrect answer.
- There is only one correct option for each question.
- Mark your answers clearly on the OMR sheet.

Computer Systems and Organisation

1. You're building a gaming PC and notice that your game loads faster when you have more RAM, but only up to a certain point. After 32GB, adding more RAM doesn't improve performance. This is primarily because:

(a) The CPU cache becomes the bottleneck

(b) The game doesn't utilize more than 32GB

(c) Secondary storage becomes the limiting factor

(d) The motherboard can't handle more RAM

2. A programmer discovers that their code runs 10x faster when they reorganize data to fit within the CPU's L1 cache. This demonstrates the importance of:

(a) Cache locality and memory hierarchy

(b) CPU clock speed optimization

(c) RAM capacity expansion

(d) Hard disk defragmentation

3. While troubleshooting a computer that won't boot, you find that removing one RAM stick fixes the problem. The faulty RAM was likely causing:

(a) Power supply overload

(b) Memory address conflicts

(c) CPU overheating

(d) BIOS corruption

4. You notice that your 1TB SSD shows only 931GB available space. The "missing" storage is primarily due to:

(a) Manufacturing defects

(b) Binary vs decimal conversion differences

(c) Reserved space for wear leveling

(d) Operating system overhead

5. A system utility that you've used to clean temporary files suddenly requires administrator privileges. This indicates it's trying to access:

(a) User profile directories

(b) System-protected locations

(c) Network shared folders

(d) External storage devices

6. You install a graphics driver, but it doesn't work until you restart. This is because:

(a) The hardware needs power cycling

(b) Kernel-level changes require reboot

(c) The GPU memory needs clearing

(d) Windows Update interfered

7. Your Python code runs without compiling, but C++ code needs compilation. The Python interpreter is essentially:

(a) Converting to machine code line by line

(b) Running pre-compiled bytecode

(c) Translating to C++ first

(d) Using just-in-time compilation

8. You're using a command-line interface instead of GUI because:

(a) It looks more professional

(b) It uses less system resources

(c) It's faster for repetitive tasks

(d) All of the above

9. When designing a logic circuit, you realize that A + A'B simplifies to A + B. This is an application of:

(a) De Morgan's Law

(b) Absorption Law

(c) Distributive Law

(d) Consensus Theorem

10. You're debugging a circuit and find that NAND gates can replace all other logic gates. This makes NAND a:

(a) Universal gate

(b) Exclusive gate

(c) Conditional gate

(d) Primitive gate

11. Converting 255 to binary gives 11111111. This pattern suggests that 255 is:

(a) The maximum value for 8 bits

(b) A prime number in binary

(c) An octal representation

(d) A hexadecimal overflow

12. You encounter a file with characters displaying as "???". This likely indicates:

(a) File corruption

(b) Wrong encoding scheme

(c) Insufficient permissions

(d) Network transmission error

13. While working with international text, you choose UTF-8 over ASCII because:

(a) UTF-8 is faster to process

(b) UTF-8 supports multilingual characters

(c) UTF-8 uses less storage space

(d) UTF-8 is more secure

14. A program crashes with "Segmentation Fault". This typically means:

(a) The program ran out of disk space

(b) Memory access violation occurred

(c) The CPU overheated

(d) Network connection was lost

15. Your computer has 8GB RAM but shows only 7.2GB usable. The difference is likely:

(a) Reserved for system processes

(b) Used by integrated graphics

(c) Lost to memory mapping

(d) All of the above

Computational Thinking and Programming

16. You're writing an algorithm to find the shortest route between cities. This is fundamentally a:

(a) Sorting problem

(b) Graph traversal problem

(c) String matching problem

(d) Numerical computation problem

17. Your program runs fine with 100 data points but crashes with 10,000. This suggests:

(a) Time complexity issues

(b) Space complexity issues

(c) Input validation problems

(d) Hardware limitations

18. You optimize a nested loop by reducing operations. This demonstrates:

(a) Algorithmic thinking

(b) Procedural programming

(c) Object-oriented design

(d) Functional programming

19. Breaking down the problem of "organizing a library" into smaller tasks like "catalog books", "arrange shelves" represents:

(a) Pattern recognition

(b) Decomposition

(c) Abstraction

(d) Algorithm design

20. You notice that both "sorting names" and "ranking students" use similar comparison logic. This is:

(a) Pattern recognition

(b) Decomposition

(c) Abstraction

(d) Generalization

21. A variable declared as 'int' in most systems can store values up to approximately:

(a) 32,000

(b) 65,000

(c) 2.1 billion

(d) Unlimited

22. You try to store 3.14159 in an 'int' variable. The result will be:

(a) 3.14159 (unchanged)

(b) 3 (truncated)

(c) 4 (rounded)

(d) Error message

23. Your program uses a boolean variable to track if a user is logged in. This demonstrates:

(a) Efficient memory usage

(b) Clear program logic

(c) State management

(d) All of the above

24. When storing names of students, you choose 'string' over 'char' because:

(a) Strings are faster to process

(b) Names have variable lengths

(c) Strings use less memory

(d) Char doesn't support letters

25. You debug a program and find that a variable changes unexpectedly. This could be due to:

(a) Scope issues

(b) Type conversion problems

(c) Memory overflow

(d) All of the above

26. Your algorithm to search a phone book starts from the middle entry. This suggests you're using:

(a) Linear search

(b) Binary search

(c) Hash table lookup

(d) Random search

27. You arrange books alphabetically on a shelf. The time it takes increases dramatically with more books. This indicates:

(a) Linear time complexity

(b) Quadratic time complexity

(c) Exponential time complexity

(d) Logarithmic time complexity

28. A recursive function to calculate factorial includes a base case to prevent:

(a) Incorrect results

(b) Infinite recursion

(c) Memory leaks

(d) Compilation errors

29. You implement a step-by-step recipe program. This demonstrates that algorithms must be:

(a) Fast and efficient

(b) Clear and unambiguous

(c) Short and simple

(d) Complex and detailed

30. Your sorting algorithm works correctly for positive numbers but fails for negative ones. This indicates insufficient:

(a) Time complexity analysis

(b) Test case coverage

(c) Memory allocation

(d) Documentation

Society, Law and Ethics

31. You notice that your browsing habits are being tracked across different websites. This creates:

(a) Digital footprints

(b) Cyber crimes

(c) IP violations

(d) E-waste

32. Before posting a photo of your friends online, you should:

(a) Edit it to look better

(b) Check the lighting quality

(c) Get their permission first

(d) Add funny captions

33. You find a perfect research paper online and want to use some ideas. To avoid plagiarism, you must:

(a) Rewrite it completely

(b) Change the conclusion

(c) Properly cite the source

(d) Use a different font

34. A software company releases their code under GPL license. This means you can:

(a) Use it only for personal projects

(b) Sell it without restrictions

(c) Modify and redistribute with same license

(d) Keep modifications private

35. You receive an email asking for your bank details to "verify your account". This is likely:

(a) A legitimate security check

(b) A phishing attempt

(c) A system update notification

(d) A promotional offer

36. Your computer starts running slowly and shows popup ads. You likely have:

(a) A virus infection

(b) Hardware failure

(c) Network congestion

(d) Operating system corruption

37. To safely browse the web, you should:

(a) Use antivirus software

(b) Keep browsers updated

(c) Avoid suspicious websites

(d) All of the above

38. Your old smartphone should be disposed of through:

(a) Regular household trash

(b) E-waste recycling centers

(c) Burning in backyard

(d) Throwing in water bodies

39. The IT Act helps in:

(a) Regulating internet speed

(b) Controlling cyber crimes

(c) Designing software

(d) Managing hardware

40. When designing computer labs for schools, accessibility features are important for:

(a) Students with disabilities

(b) Advanced programmers

(c) Network administrators

(d) Hardware technicians

Advanced Conceptual Questions

41. You're debugging and notice that changing the order of operations in your code gives different results. This demonstrates:

(a) Compiler optimization issues

(b) Operator precedence rules

(c) Memory allocation problems

(d) Variable scope confusion

42. Your program works on your computer but crashes on your friend's identical setup. This suggests:

(a) Hardware compatibility issues

(b) Different software versions

(c) Environment configuration differences

(d) All of the above

43. In hexadecimal, the color code FF0000 represents pure red. The 'FF' indicates:

(a) Maximum intensity (255 in decimal)

(b) Minimum intensity (0 in decimal)

(c) Medium intensity (128 in decimal)

(d) Random intensity value

44. You implement a cache in your program and see 90% performance improvement. This demonstrates:

(a) The importance of memory hierarchy

(b) Better algorithm design

(c) Improved coding practices

(d) Hardware optimization

45. When building a truth table for (A AND B) OR (NOT A AND C), you realize it has:

(a) 4 rows

(b) 6 rows

(c) 8 rows

(d) 16 rows

46. You compress a file from 1MB to 200KB without losing quality. This is possible because:

(a) The file had redundant data

(b) Modern algorithms are perfect

(c) Some quality was actually lost

(d) The measurement was wrong

47. Your loop runs 1000 times but only the last 10 iterations produce useful results. This suggests:

(a) Poor algorithm design

(b) Hardware limitations

(c) Compiler optimization issues

(d) Normal programming behavior

48. You discover that your "secure" password is in a leaked database online. This violates:

(a) Copyright laws

(b) Data protection principles

(c) Patent rights

(d) Trademark regulations

49. A website changes its interface based on whether you're using mobile or desktop. This demonstrates:

(a) Responsive design principles

(b) Server-side processing

(c) Database optimization

(d) Network protocols

50. You notice your program uses 100% CPU when processing large files. To optimize, you should:

(a) Buy a faster CPU

(b) Process files in smaller chunks

(c) Add more RAM

(d) Use a different programming language

51. In binary, the pattern 10101010 converted to decimal equals:

(a) 170

(b) 85

(c) 255

(d) 128

52. You XOR a number with itself and get 0. This property is used in:

(a) Data encryption

(b) Error detection

(c) Memory management

(d) All of the above

53. Your smartphone uses UTF-8 encoding, which allows it to:

(a) Run faster applications

(b) Display emoji and international text

(c) Connect to more networks

(d) Use less battery power

54. When you delete a file, it often can be recovered because:

(a) The data remains on disk

(b) Backups are automatic

(c) Cloud storage retains copies

(d) The OS keeps history

55. A program that modifies itself while running is demonstrating:

(a) Self-modifying code

(b) Dynamic loading

(c) Just-in-time compilation

(d) Interpreted execution

56. You notice that websites load faster the second time you visit them. This is due to:

(a) Browser caching

(b) Improved internet speed

(c) Server optimization Ẇebsite updates

57. Creating a backup of your important files is an example of:

(a) Data redundancy for safety

(b) Wasting storage space

(c) Copyright infringement

(d) Poor file management

58. Your antivirus detects a "Trojan horse". This type of malware:

Ṙeplicates itself automaticallyAppears useful but hides malicious code Ḋisplays unwanted advertisements Encrypts your files for ransom

59. You're asked to design an inclusive computer interface. Your priority should be:

(a) Colorful graphics Ȧccessibility for all users

(b) Latest technology features

(c) Maximum processing speed

60. Open Source software promotes:

(a) Higher software costs

(b) Transparency and collaboration

(c) Exclusive ownership rights

(d) Limited user access

Integration and Application

61. You're building a system that needs to process data from sensors every millisecond. Your biggest concern should be:

(a) Real-time performance

(b) Data storage capacity

(c) User interface design

(d) Network connectivity

62. Implementing a binary search requires the data to be:

(a) Stored in memory

(b) Previously sorted

(c) Numerical only

(d) Error-free

63. The statement "If it's raining, I'll carry an umbrella" can be represented in logic as:

(a) Rain AND Umbrella

(b) Rain OR Umbrella

(c) Rain $\rightarrow$ Umbrella

(d) NOT Rain

64. When scaling your application from 100 to 10,000 users, you should focus on:

(a) Code readability

(b) Performance optimization

(c) Feature addition

(d) User interface polish

65. You implement error handling in your code to:

(a) Make code longer

(b) Improve user experience

(c) Slow down execution

(d) Complicate debugging

66. Digital signatures help ensure:

(a) Faster file transfer

(b) Document authenticity

(c) Better compression

(d) Smaller file sizes

67. You use version control (like Git) primarily to:

(a) Compress files

(b) Track changes and collaborate

(c) Speed up compilation

(d) Reduce bugs automatically

68. The principle of "least privilege" in cybersecurity means:

(a) Users get maximum permissions

(b) Users get minimum necessary permissions

(c) Permissions change randomly

(d) No permissions for anyone

69. When your program handles personal data, you must consider:

(a) Processing speed only

(b) Storage efficiency only

(c) Privacy and security requirements

(d) User interface design only

70. Debugging a program is essentially:

(a) Rewriting from scratch

(b) Systematic problem solving

(c) Adding more features

(d) Improving performance

71. The concept of "algorithm efficiency" is most important when:

(a) Writing short programs

(b) Dealing with large datasets

(c) Using simple operations

(d) Working with text files

72. Creating modular code (functions/procedures) helps with:

(a) Code reusability and maintainability

(b) Faster execution speed

(c) Smaller file sizes

(d) Better graphics display

73. The hexadecimal number system is particularly useful in computing because:

(a) It's easier to calculate mentally

(b) It maps well to binary representation

(c) It uses fewer symbols

(d) It's more accurate than decimal

74. When you encounter a "buffer overflow" error, it typically means:

(a) Your screen resolution is wrong

(b) You've exceeded allocated memory boundaries

(c) Your internet connection failed

(d) Your hard disk is full

75. The most important consideration when designing technology for educational use is:

(a) Latest hardware specifications

(b) Inclusive accessibility for all learners

(c) Cheapest implementation cost

(d) Most advanced features available

END OF QUESTION PAPER

Best of luck! Remember: Understanding concepts is more valuable than memorizing facts.