Sl. No.:

QUESTION BOOKLET

Booklet Id.:
JM/01/A/150

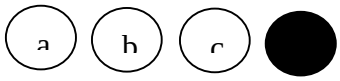
Roll No.						

Time Allowed: 2 hrs 30 mins **Total Marks: 150**

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE ASKED TO DO SO

Read the following instructions carefully before you begin to answer the questions.

INSTRUCTIONS TO CANDIDATE

1) You are required to write your Roll Number in the prescribed place provided at the top of this Question Booklet and the OMR Answer Sheet.
2) **You are required to mention the Question Booklet Id. as mentioned above in your OMR Answer Sheet.**
3) Please ensure that the Question Booklet has the required number of pages immediately after opening the same. In case there is any shortage of any page(s), please report the same to the invigilator.
4) This Question Booklet contains 100 multiple choice questions to be answered in a separate OMR Answer Sheet by using **Blue/Black ball pen** only. Do not use **Ink/Gel pen**.
   - All questions are compulsory and carry equal marks.
   - There is no negative marking for wrong answers.
   - **Directions for answering the questions**:
     Each question is followed by four alternative suggested answers. You are required to select the correct answer and darken the appropriate circle of a, b, c and d by Blue/ Black ball pen in such a manner that the circle is completely darkened.
     Example: Question No.63
     Given below are four odd words, three are alike in some way and one is different. Find the odd word:
     (a) Ganga (b) Brahmaputra
     (c) Jamuna (d) Himalaya
     Here the correct answer is Himalaya, i.e., (d). So, in the OMR Answer Sheet the darkened circle should be marked as
     63. 

5) In any case, if more than one circle against each question is darkened, that particular question would be treated as invalid and will not be evaluated.
   - At the end of the examination, the candidate should ensure that he/ she submits the OMR Answer Sheet and the Question Booklet to the invigilator before leaving the examination hall/ room.
6) This Question Booklet cannot be carried with you. You have to submit this along with your OMR Answer Sheet to the invigilator.
7) No rough work is to be done on the OMR Answer Sheet. You can do the rough work on the space provided on the Question Booklet.
8) **Use and possession of mobile phones and electronic gadgets/calculators are strictly prohibited inside examination hall/ room.**
9) Non compliance with any of the above instructions will make a candidate liable to action/ penalty as may be deemed fit.

Space for Rough Work

Choose the correct option for each question and darken the circle against the option in the OMR Answer Sheet.

1. Which one of the following arrays represents a binary maxheap?
   a) (25, 12, 16, 13, 10, 8 , 14) b) (25, 14, 13, 16, 10, 8, 12)
   c) (25, 14, 16, 13, 10, 8, 12) d) (25, 14, 12, 13, 10, 8, 16)

2. Consider the following C code :

```
int f ( int n)
 {
    static  int p=0;
   If( n <=0) return 1;
         If ( n> 3)
                 { p=n;
                return f( n-2) + 2 ;
                }
          return  f(n-1) + p;
  }
```

   What is the value of f(4) ?
   a) 5 b) 4 c) 7 d) 18

3. What is the Average complexity of quicksort algorithm ?
   a) O(nlogn) b) $O(n^2)$
   c) O(n) d) O(n/2)

4. A structure that can be placed within another structure is known as
   a) Self referential structure b) Nested structure
   c) Parallel structure d) Pointer to structure

5. Huffman algorithm can be implemented using a _____
   a) Dequeue b) Queue c) Priority queue d) None of these

6. A binary tree of height h has at least h nodes and atmost _____nodes.
   a) 2h b) 2^h c) 2^{h-1} d) 2^h -1

7. The height of a binary heap with n nodes is equal to
   a) O(n) b) O(log n) c) O(n log n) d) $O(n^2)$

8. The term optimal can mean
   a) shortest b) cheapest c) fastest d) All of these

9. Which algorithm uses the divide, conquer, and combine algorithmic paradigm?
   a) Selection sort b) Insertion sort
   c) Merge sort d) Radix sort

10. In which of the following hash functions, do consecutive keys map to consecutive hash values?
    a) Multiplication method b) Division method
    c) Folding method d) Mid square method

11. The process of examining memory locations in a hash table is called

a) Hashing b) Collision c) Probing d) Addressing

12. s1="HI" s2="HELLOW", s3="BYE". How can we concatenate the three strings?

a) strcat(s1, s2, s3) b) strcat(s1,(strcat(s2,s3)))

c) strcpy(s1, strcat(s2, s3)) d) None of these

13. A linklist is a

a) Random access structure b) Sequential access structure

c) Both d) none of these

14. Which of the following is stable sorting algorithm

a) Merge sort b) Insertion sort c) Radix sort d) All of these

15. Candidate key is also known as _____

a) superkey b) Irreducible superkey

c) Foreign key d) Primary key

16. Which of the following is the binary operation?

a) Union b) Join c) Cartesian Product d) All of these

17. Which of the following is not classified as primary storage?

a) Main memory b) Cache c) Magnetic disk d) Flash memory

18. ALU works on the instructions and data held in the _____

a) Notebook b) Registers c) Capacitors d) I/O devices

19. 2^{70} ?

a) Exabyte b) Petabyte c) Zettabyte d) None of these

20. The program

```
main()
{
        int i = 5;
            i=(++i)/(i++);
            printf("%d", i);
    prints
```

a) 2 b) 5 c) 1 d) 6

21. How many distinct binary search tree can be created out of 4 distinct keys?

a) 5 b) 14 c) 24 d) 35

22. Which of the following sorting algorithms has lowest worst case complexity?

a) Merge sort b) Bubble sort c) Quick sort d) Selection sort

23. The 2's complement representation of the decimal value -15 is

a) 1111 b) 11111 c) 111111 d) 10001

24. What is the swap space in the disk used for?

a) saving the super block b) storing the device drivers

c) saving temporary HTML pages d) saving process data

25. FIFO is a _____algorithm.

a) Preemptive b) Non preemptive c) Both a) and b) d) None of these

26. A Boolean function x'y' + xy + x'y is equivalent to

a) x' + y' b) x + y c) x + y' d) x' + y

27. The minimum number of D flip flops needed to design a mod-258 counter is

a) 9 b) 8 c) 512 d) 258

28. The hexa decimal representation of 255_{10} is

a) 15F b) FF c) F15 d) 1515

29. How many select line is needed in a 32x1 multiplexer ?

a) 32 b) 1 c) 5 d) 4

30. How many 3 to 8 line decoders with an enable input are needed to construct a 6 to 64 line decoder without using any other logic gates?

a) 7 b) 8 c) 9 d) 10

31. The distance that can cover by a cat6 cable without repeater is

a) 100 feet b) 100 meter c) 300 meter d) 500 meter

32. The default parameter passing mechanism in C is

a) call by value b) call by reference

c) call by pointer d) None of these

33. Which of the following is useful in traversing a given graph by breadth first search?

a) Stack b) Set c) List d) Queue

34. The Pre-order and Inorder traversals of a binary tree are F A E K C D H G B, E A C K F H D B G respectively. Post order traversal is

a) F A E C K D H G B b) E K C A H B G D F

b) E C K A H G B D F d) E C K A H B G D F

35. Which of the following system software resides in main memory always?

a) Text editor b) Assembler c) Loader d) All of these

36. Loss in signal power as light travels down the fiber is called?

a) Attenuation b) Propagation c) Scattering d) Interruption

37. Which of the following is private IP address?

a) 192.168.24.43 b) 168.172.19.39

c) 172.15.14.36 d) 12.0.0.1

38. The main difference between JK and RS flip-flop is that?

a) JK flip-flop does not need a clock pulse

b) there is feedback in JK flip-flop

c) JK flip-flop accepts both inputs as 1

d) JK flip-flop is acronym of junction cathode multivibrator

39. Which of the following expressions is in the sum-of-products (SOP) form?

a) AB + CD b) AB(CD) c) (A + B)(C + D) d) (A)B(CD)

40. The inner core of an optical fiber is _____

a) Glass or plastic b) Copper c) bimetallic d) liquid

41. Which layers of the OSI model does data compression?

a) Network b) Datalink c) Physical d) Presentation

42. Router operates in

a) Data link layer b) Transport layer

c) Network layer d) All of the above

43. ARP is used to find

a) IP address b) MAC address c) Subnet address d) Host address

44. 802.5 is

a) CSMA/CD b) Token Ring c) Token Bus d) None of these

45. The number of address lines required to address 8 GB memory is

a) 8 b) 1024 c) 32 d) 33

46. Which one of the following uses UDP as a transport protocol ?

a) HTTP b) Telnet c) DNS d) SMTP

47. The maximum number of hosts in Class C using the masks 255.255.255.0?

a) 255 b) 2^8 c) 254 d) none of these

48. The binary number $(1101101.111)_2$ is equivalent to

a) (109.875)10 b) (109.89)10

c) (109.835)10 d) (101.111)10

49. An organization has a class-B network and wishes to form subnets for 64 departments. The subnet mask would be

a) 255.255.0.0 b) 255.255.64.0

c) 255.255.128.0 d) 255.255.252.0

50. Which of the following is not practically possible ?

a) SISD b) SIMD c) MISD d) MIMD

51. Which of the following does not support more than one program at a time?

a) DOS b) Linux c) Windows d)Unix

52. Which is not an external command?

a) Edit b) XCOPY c) Sys d) None of the above

53. A 8 bit microprocessor must have

a) 8 addresss line b) 8 data lines

c) 8 control lines d) None of the above

54. Trojan-horse programs

a) Are legitimate programs that allow unauthorized access

b) Are hacker programs that do not slow up the system

c) Really do not usually work

d) Usually or immediately discovered

55. A common bus can be designed using
a) multiplexer b) Three state buffers
c) both a and b d) None of these

56. Cache memory is implemented using
a) Dynamic RAM b) EPROM c) EEPROM d) None of the above

57. The highest priority interrupt in 8085 microprocessor is
a) INTR b) RST 7.5 c) TRAP d) RST 5.5

58. How many full adders are needed to add two 4 bit numbers ?
a) 8 b) 2 c) 4 d) 16

59. Thrashing
a) Reduces page I/O
b) Decreases the degree of multiprogramming
c) Implies excessive page I/O
d) Improve the system performance

60. Assembly language statement for action is called
a) assembler directive b) imperative statement
c) declarative statement d) None of the above

61. Cache memory is used in computer system to
a) Ensure fast booting b) Replace static memory
c) Relace harddisk d) none of the above

62. With segmentation, if there are 64 segments and maximum segment size is 512 words; the length of logical address is how many bits
a) 12 b) 6 c) 15 d) 9

63. Which of the following file extensions indicate only graphics files ?
a) BMP and DOC b) TXT and STK c) JPEG and TXT d) BMP and GIF

64. Status bar shows different types of keys:
a) Num lock key b) Caps lock key c) Scroll lock key d) All of these

65. The default workbook opens with _____worksheet.
a) 3 b) 4 c) 1 d) None of these

66. A sparse matrix is better represented using a/an:
a) array b) binary tree c) multi-linked list d) stack

67. In long-distance data transmission system, the most preferable mode of communication is:
a) serial transmission b) parallel transmission
c) Either serial or parallel transmission d) None of the above

68. The performance of a data communications network depends on
a) the numbers of users b) the transmission media
c) the hardware and network operating system d) All of the above

69. Consider the following program fragment:

```
switch(input)
    {
      case '1' : printf("one");
      case '3' ": printf("three");
       case '5' : printf("five");
       default: printf("odd");
                break;
    }
```

What will be printed when input is '3'?

a)Three b) threeodd c) threefiveodd d) three three three

70. Consider the following two definitions

Int a[10]; int *p;

Which of the following statement is incorrect ?

a) P=a+2; b) p=a+2; *p=a[5];

c) a=p d) p=&a[3];

71. Which of the following preprocessor directives is used to create macros

a) #include b) #ifdef c) #define d) undef

72. chmod command in UNIX/LINUX

a) Changes the current execution status from user mode to kernel mode

b) makes the file hidden so that it cannot be seen using the ls command

c) changes the authentication permission

d) Changes the access permissions of a file or directory

73. In vi editor we can paste a deleted line using

a) Y b) cp c) p d) paste

74. Which one of the following file allocation strategy is used by UNIX operating system

a) contiguous allocation b) Linked allocation

c) Indexed allocation d) Sequential allocation

75. A computer has 6 tap drives, with n process competing for them. Each process may need two drives. What is the maximum value of n for the system to be deadlock free?

a) 6 b) 5 c) 4 d) 3

76. The command shift $n will

a) shift positional parameters by the value of n.

b) shift positional parameter by 1

c) not shift positional parameter

d) result in an error

77. context switching is:

a) part of spooling b) part of poling

c) part of interrupt handling d) part of interrupt servicing

78. Swiches are

a) unicasting device b) multicasting

c) broadcasting e) none of these

79. The overhead in time division multiplexing is required for

a) synchronization b) clock recovery

c) error-control d) none of these

80. HDLC is a _____protocol.

a)Character-oriented b) bit oriented

c) byte oriented d) count oriented

81. which of the following is not a library function ?

a) isprint() b) isdigit() c) isspace() d) none of these

82.Which one is not true ?

a) A relation is in BCNF if it is in 4NF

b) BCNF is stricter than 3 NF

c) A relation is in BCNF if every determinant of the relation is a candidate key

d) All are true

83. In a relation referential integrity constraint can be specified with the help of

a) primary key b) Secondary key c) Foreign key d) None of these

84. Which of the following is not a proper state of transaction?

a) Partially aborted b) partially committed

c) Aborted d) Committed

85. Which one is authorization command in SQL ?

a) Access b) Allow c) Grant d) None of these

86. Desirable properties of transactions are

a) Atomicity, concurrency control, isolation, durability

b) Atomicity, consistency preservation, isolation, durability

c) Atomicity, correctness, isolation, durability

d) Atomicity, conflict serilizable, isolation, durability

87. Spooling is most beneficial in multiprogramming environment where

a) Most jobs are I/O bound

b) Most jobs are CPU bound

c) Jobs are evenly divided as I/O bound and CPU bound

d) There is limited primary memory and need for secondary memory

88. How many 16Kx1 RAM chips needed to provide a memory capacity of 256 Kbytes ?

a) 16 b) 8 c) 64 d) 256

89. Which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock?

1. 2 phase locking
2. Time stamp ordering

a) 1 only b) 2 only c) Both 1 and 2 d) Neither 1 nor 2

90. Consider a B+ tree in which the maximum number of keys in a node is 5. What is the minimum number of keys in any non root node?

a) 1 b) 2 c) 3 d) 4

91. Four jobs to be executed on a single processor system arrives at a time 0+ in order A, B, C, D their CPU burst time represents are 4, 1, 8, 1 time units respectively. The completion time of A in Round Robin scheduling algorithm with time slice of 1 time unit is

a) 10 b) 8 c) 9 d) 4

92. To expedite the process of page table access OS use

a) Main memory b) TLB

c) Virtual memory d) Magnetic memory

93. Which of the following page replacement algorithm is only theoretical use?

a) FIFO b) LRU

c) Optimal page replacement d) None of these

94. Memory compaction is a solution for

a) Internal fragmentation b) External fragmentation

c) Buddy system d) All of these

95. Where does the swap space reside ?

a) RAM b) Disk c) ROM d) On chip cache

96. In the context of operating systems, which term would you not associate with scheduling of processes

a) Round Robin b) Preemptive c) Waiting queues d) interruptible

97. Which of the following design is both software and hardware independent ?

a) Logical b) Physical c) Conceptual d) None of the above

98. A directed graph which detects a deadlock is called

a) Cyclic graph b) wait for graph

c) deadlock graph d) deadlock detection graph

99. Which of the following model is called meta model

a) Prototype model b) water fall model

c) Iterative water fall model d) spiral model

100. Which of the following software testing method requires programming knowledge

a)black box testing b) white box testing c) Both a) and b) d) none of these

101. In round robin scheduling as time quantum is increased, the average turn around time

a) increases b) decreases c) varies irregularly d) remain constant

102. The coupling between different modules of a software is categorized as follows

1. Content coupling 2. Common coupling 3. Control coupling
4. stamp coupling 5. Data coupling

Coupling between modules can be ranked in the order of least desirable to most desirable as follows

a) 1, 2, 3, 4, 5 b) 5, 4, 3, 2, 1 c) 1, 2, 4, 3, 5 d) 4, 2, 5, 3, 1

103. The IP address of a packet is normally analyzed by the

a) switch b) Hub c) Router d) Modem

104. A network that can function without a server is a

a) Ring network b) Star network c) Bus network d) All of the above

105. The following is not an Internet search engine

a) Google b) Excite c) Webcrwler d) Scientra ans

106. In Excel, the simplest way to move data from one location to another is

a) by menu commands b) by the drag and drop method
c) by mouse d) by short cut menu

107. The basic features of web browsers:

a) Search and display various websites
b) send and receive e-mail messeges
c) switch over between various websites Web pages are uniquely defined using
d) All of the above

108. Which is the default scripting language in ASP ?

a) Javascript b) Perl c) EcmaScript d) VBscript

109. SSL is a

a) Scripting language b) Browser c) Secure connection d) Authoring tool

110. Which one is not a size measure of software ?

a) LOC b) Function point
c) Halstead's Program length d) Cyclomatic complexity

111. Regression testing is done

a) Software Development phase b) Maintenance phase
c) Feasibility study d) None of these

112. Consider the following program module

```
Int model(int x, int y) {
    while ( x !=y) {
If( x > y) then
        x=x-y;
else   y=y-x;
}
return  x;
}
```

What is a cyclomatic complexity of the above module?

a) 1 b) 2 c) 3 d) 4

113. Which of the following is not software reliability matrics

a) Mean time between failure b) Availability

c) Throughput d) Probability of failure on Demand

114. Which of the following is not a phase in Compiler?

a) Lexical Analyzer b) Code generation

c) symantic Analyzer d) None of these

115. The world wide web integrates which of the following

a) E-mail, Telnet, Usenet b) Sound and movies files

c) a and b d) All internet communication tools

116. Pick the machine independent phase(s) of compiler.

a) Syntax analysis b) Lexical analysis

c) Intermediate code generation d) All of the above

117. Which of the following is NOT a key component of object oriented programming?

a) Inheritance b) Encapsulation c) Polymorphism d) Parallelism

118. What is the output of the following program?

```
void main( )
    {

      static  int value = 5;
       float total;
       total = value + value / 2;
       cout << total ;
    }
```

a) 7.5 b) 7.0 c) 5.0 d) 7

119. The Java compiler translates source code into

a) machine code. b) Assembly code. c) Byte code. d) JVM code

120. Single inheritance, Multiple inheritance, and Aggregation comes under _____

a) Modularity b) Typing c) Hierarchy d) None of the above

121. How big is the conventional memory in a PC?

a) 640 K b) 340 K c) 540 K d) None of these

122. The maximum zoom in excel is

a) 400% b) 1000% c) 500% d) 200%

123. The short cut key used to rename file/folder is

a) F3 b) F4 c) F2 d) F1

124. The default column width of an excel cell is

a) 12.75 b) 500 c) 200 d) 8.43

125. How many ways you can save a document in MS-word

a) 3 b) 2 c) 4 d) 5

126. Which of the following is not a type of firewall ?

a) Packet-filtering firewall b) Proxy firewall

c) Stageful Inspection d) None of these

127. How long is an IPV6 address

a) 32 bits b) 48 bits c) 128 bits d) 128 bytes

128. Relational Algebra is

a) Data definition language b) Meta language

c) Procedural language d) Non procedural language

129. The data model which describes how the data is actually stored is

a) internal model b) External model

c) Logical model d) None of these

130. An association of several entities in an Entity Relation model is called

a) Tuple b) Relationship c) record d) Field

131. Which normal form is considered adequate for relational database design ?

a) 2 NF b) 3 NF c) 4 NF d) BCNF

132. Bottom up parser generates

a) right most derivation in reverse b) right most derivation

c) left most derivation d) left most derivation in reverse

133. In case of operator overloading, operator function must be _____ .

1. Static member functions
2. Non- static member functions
3. Friend Functions

a) Only 2 b) Only 1, 3

c) Only 2 , 3 d) All 1 , 2, 3

134. Which of the following is false with respect to inheritance?

a) When a base class is privately inherited, public members of the base class become private members of the derived class

b) When a base class is publicly inherited, public members of the base class becomes public members of derived class

c) When a base class is privately inherited, a private member of base class becomes private member of derived class

d) When a base class is publicly inherited protected members of base class becomes protected members of derived class

135. Producer consumer problem can be solved using

a) Semaphore b) Monitor c) event counters d) All of the above

136. Standard interface used to send commands between computers and musical instruments is

a) Hypermedia b) RealAudio c) AAC d) MIDI

137. The creation of motion from still pictures is called

a) Sampling b) 3-D modeling c) transition d) Animation

138. What is the process that condenses files so they can be stored in less space and transmitted over the Internet at a faster rate ?

a) Data downloading b) Data compression

c) Digitization d) Defragmentation

139. Software that stores lines and shapes rather than individual pixels is known as

a) Vector graphics software b) raster graphics software

c) bit-mapped graphics software d) resolution software

140. A compiler running on computers with small memory would normally be

a) a multipass compiler b) single pass compiler

c) a compiler with less number of phases d) None of these

141. Input of a D flip flop is 1. The output of the D flip flop is

a) 0 b) 1

c) Either 0 or 1 d) Can not say

142. After you service a laser printer, you notice dirty print. Which of the following would correct the problem.

a) Clean the developer tank b) Reset the printer

c) Run several blank pages d) Clean the laser diode

143. Which common bus specification provides the fastest data transfer rate?

a) VL bus b) ISA c) PCI d) All of these

144. In the terminology used in the RS-232C communication standards Modems are

a) DTE b) DCE c) FSK d) None of these

145. The number of hardware interrupts that the processor 8085 consists of is

a) 1 b) 3 c) 5 d) 7

146. The size of each segment in 8086 is

a) 64 KB b) 24 KB c) 256 KB d) 50 KB

147. How many type of cache memory:

a) 2 b) 3 c) 1 d) 4

148. The physical address of memory in 8086 is

a) 20 bits b) 16 bits c) 24 bits d) None of these

149. Which of the following is used for manufacturing chips?

a) Control bus b) control unit

c) Parity unit d) Semiconductor

150. What is SIM in 8085 ?

a) Select interrupt Mask b) Set interrupt mask

c) Sorting interrupt mask d) None of these

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