B.S.ABDUR RAHMAN UNIVERSITY
SCHOOL OF COMPUTER, INFORMATION AND MATHEMATICAL SCIENCES
Ph.D. ENTRANCE EXAMINATION, JUNE 2016
(Common to CSE, IT & CA)

ANSWER SHEET

Instructions to candidate:

*Answer all the questions provided in the question paper
*All the questions carry equal marks; No negative marking for wrong answers.
*Write your answer in the space provided in the answer sheet against the corresponding Q.No.

Name of the Candidate: **Application No.:**
Branch Opted: **Time:** 120 Minutes

Q.No	Answer	Q.No	Answer	Q.No	Answer	Q.No	Answer	Q.No	Answer
1		21		41		61		81	
2		22		42		62		82	
3		23		43		63		83	
4		24		44		64		84	
5		25		45		65		85	
6		26		46		66		86	
7		27		47		67		87	
8		28		48		68		88	
9		29		49		69		89	
10		30		50		70		90	
11		31		51		71		91	
12		32		52		72		92	
13		33		53		73		93	
14		34		54		74		94	
15		35		55		75		95	
16		36		56		76		96	
17		37		57		77		97	
18		38		58		78		98	
19		39		59		79		99	
20		40		60		80		100	

For Office Use:

Total Score out of 100	Name & Signature of Examiner	Verified by

B.S. Abdur Rahman University::Chennai – 48
School Of Computer, Information and Mathematical Sciences
Ph.D. Entrance Exam - June 2016

Max Marks: 100 **Duration: 2 Hrs.**

1. A binary operation on a set of integers is defined as $x \oplus y = x^2 + y^2$ .Which one of the following statements is TRUE about $\oplus$?
   a. Commutative but not associative b. Both Commutative and associative
   c. Associative but not Commutative d. Neither Commutative nor associative

2. Stack consists of a. Register b. RAM c. ROM d. CPU

3. Microprogramming is designing of a. Control Unit b.ALU c. CPU d. None of the above

4. The smallest integer that can be represented by an 8- bit number in 2's complement form is
   a. -256 b. -128 c. -127 d. 0

5. FTP is
   a. Mail transfer protocol b. File Transfer Protocol c. File Transformation Program
   d. Firewall Type Program

6. Stored program concept was introduced by a. Pascal b. Hollerith c.Stallman d. Newmann

7. BSS loader is a. General b. Absolute c. Relocating d. None of the above

8. The first Indian analog computer was implemented by Indian Statistical Institute of Calcutta in
   a. 1947 b. 1956 c. 1953 d. 1961

9. Which of the following is considered to be a popular coding scheme?
   a. ASCII b. EBCDIC c. Unicode d. All the above

10. A link may be defined as the representation of an
    a. objects b.application c. program d. none of the above

11. DPI stands for
    a. Desktop projection Ink b.Dot per Inch c. Dotmatricks printer ink d. Desktop pixel Inch

12. Which of the following medical activity was made possible by computers?
    a. Open Heart Surgery b. Vaccination c. Brain scan d. X Ray

13. Let N be the set of all natural numbers. Which of the following sets are countable?
    I. The set of all functions from N to , 0 1 k p
    II. The set of all functions from , 0 1 k p to N
    III. The largest subset of N

a.None b. I and II only c. I and III only d. II and III only e. I, II, and III

14. Which of the following comes closest to being a perfectly secure encryption scheme?
a.The Caesar Cipher, a substitution cipher b.DES (Data Encryption Standard), a symmetric-key algorithm
c.Enigma, a transposition cipher d. One-time pad e. RSA, a public-key algorithm

15. Which of the following characteristics of a programming language is best specified using a context-free grammar?
a. Identifier length b. Maximum level of nesting c. Operator precedence d. Type compatibility
e. Type conversion

16. Consider the following possible data structures for a set of n distinct integers.
I. A min-heap II. An array of length n sorted in increasing order III. A balanced binary search tree. For which of these data structures is the number of steps needed to find and remove the 7th largest element O n (log) in the worst case?
a. I only b. II only c. I and II d. I and III e. II and III

17. Company X shipped 5 computer chips, 1 of which was defective, and Company Y shipped 4 computer chips, 2 of which were defective. One computer chip is to be chosen uniformly at random from the 9 chips shipped by the companies. If the chosen chip is found to be defective, what is the probability that the chip came from Company Y?
a. 2/9 b. 4/9 c.1/2 d. 2/3 e. 5/7

18. A CPU has an arithmetic unit that adds bytes and then sets its V, C, and Z flag bits as follows. The V-bit is set if arithmetic overflow occurs (in two's complement arithmetic). The C-bit is set if a carry-out is generated from the most significant bit during an operation. The Z-bit is set if the result is zero. What are the values of the V, C, and Z flag bits after the 8-bit bytes 1100 1100 and 1000 1111 are added?
V C Z
a.0 0 0
b.1 1 0
c.1 1 1
d.0 0 1
e.0 1 0

19. Which of the following is NOT a reasonable justification for choosing to busy-wait on an asynchronous event?
a. The wait is expected to be short. b. A busy-wait loop is easier to code than an interrupt handler.
c. There is no other work for the processor to do. d. The task must meet some hard real-time deadlines.
e. The program executes on a time-sharing system.

20. The problem of fragmentation arises in
a. static storage Allocation b. stack allocation of storage c.stack allocation with dynamic binding
d. Heap allocation

21. The process of organizing the memory into two banks to allow 8 and 16-bit data operation is called
a. Bank Switching b. Indexed Mapping c. Two-way memory interleaving

d. Memory segmentation

22. Memory refreshing may be done
a. by the CPU that contains a special regress counter, only b. by an external refresh controller, only
c. either by the CPU or by an external refresh controller d. none of the above

23. The use of hardware in memory management is through segment relocation and protection is
a. to perform address translation to reduce size of the memory b. to perform address translation to reduce execution time overhead c. both (a) and (b) d. none of the above

24. Thrashing occurs when
a. too much of the time is spent in waiting to swap between memory and disk
b. two processes try to access the same resource
c. the size of the data to be inserted is less than the size of a page in memory
d. the processor's mapping table discovers that the program is trying to use an address that doesn't currently exist

25. The operators << (left shift) and >> (right shift) are
a. assignment operators b. relational operators c. logical operators d. bitwise logical operators

26. In C, the NULL statement which does nothing is just
a. , b. ; c. : d. .

27. The general form of do-while statement is
a. do expression while statement; b. do while expression; c. do statement while expression;
d. do statement while statement;

28. The statements that can be used to change the flow of control is
a. if and switch b. if and while c. switch and do-while d. break and continue

29. In printf(), the appearance of the output can be affected by
a. field width b. conversion character c. flag d. all of the above
e. none of the above

30. Which of the following scanf() statement is true ?
a. scanf("%f', float-var-name); b. scanf("%d ∑"); c. scanf("%d", &int-var-name);
d. scanf("%d", &number);

31. In a relational schema, each tuple is divided into fields called
a. Relations b. Domains c. Queries d. All of the above

32. A logical schema

a. is the entire database b. is a standard way of organizing information into accessible parts
c. describes how data is actually stored on disk d. all of the above

33. A form defines a. where data are placed on the screen b. the width of each field
c. both (a) and (b) d. All of the above

34. A top-to-bottom relationship among the items in a database is established by a
a. Hierarchical Schema b. Network Schema c. Relational Schema
d. All of the above

35. A command that lets you change one or more fields in a record is
a. Insert b. Modify c. Look-up d. All of the above

36. Which of the following contains a complete record of all activity that affected the contents of a database during a certain period of time?
a. Report writer b. Query language c. Data manipulation language
d. Transaction Log

37. A 'C' program contains the declarations and initial assignments: int i=8, j=5; The value of arithmetic expression 2*((i/5)+(4*j-3)%(i+j-2)) is a. 18 b. 14 c. 1 d. 17

38. Which of the following provides more flexibility in connecting wired devices?
a. bus networks b. star networks c. ring networks d. T-switched networks e. none of the above

39. FDDI is a a. ring network b. star network c. mesh network d. bus based network
e. none of the above

40. A station in a network forwards incoming packets by placing them on its shortest output queue. What routing algorithm is being used?
a. flooding b. hot potato routing c. static routing d. delta routing

41. Which of the following refers to the terms "residual error rate”?
a. the number of bit error per twenty four hours of continuous operation on an asynchronous line
b. the probability that one or more errors will be undetected when an error detection scheme is used
c. the probability that one or more errors will be detected when an error detection mechanism is used
d. signal to noise ratio divided by the ratio of energy per bit to noise per hertz

42. Suppose that a certain software product has a mean time between failures of 10,000 hours and has a mean time to repair of 20 hours. If the product is used by 100 customers, what is its availability?
a. 80% b. 90% c.98% d.99.8% e. 100%

43. In the following table V=1 if and only if the input is valid.

Inputs				Outputs		
D_0	D_1	D_2	D_3	X_0	X_1	V
0	0	0	0	x	x	0
1	0	0	0	0	0	1
x	1	0	0	0	1	1
x	x	1	0	1	0	1
x	x	x	1	1	1	1

What function does the truth table represent?

A. Priority encoder B. Decode C. MultiplexerD. Demultiplexer

44. Which one of the following is the tightest upper bound that represents the number of swaps required to sort *n* numbers using selection sort?

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

45.which of the following is the tightest upper bound that represents the time complexity of inserting an object into a binary search tree of *n* nodes?

(A)O(1) (B)O(log *n*) (C)O(*n*) (D)O(*n* log *n*)

46. What is the maximum number of reduce moves that can be taken by a bottom-up parser for a grammar with no epsilon- and unit production (i.e., of type A→ε and A→ a) to parse a string with n tokens?

A. n/2 B.n-1 C.2n-1 D.2^n

47. the transport layer protocols used for real time multimedia, file transfer, DNS and email, respectively are

(A)TCP, UDP, UDP and TCP
(B)UDP, TCP, TCP and UDP
(C)UDP, TCP, UDP and TCP
(D)TCP,UDP,TCP and UDP

48. An index is clustered ,if

(A) it is on a set of fields that form a candidate key
(B) it is on a set of fields that form the primary key
(C)the data records of the file are organized in the same order as the data entries of the index
(D) the data records of the file are organized not in the same order as the data entries of the index

49. Consider an undirected random graph of eight vertices. The probability that there is an edge between a pair of vertices is 1/2. What is the expected number of unordered cycles of length three?

A. 1/8 B.1 C.7 D.8

50. Which of the following statements is/are **TRUE** for undirected graphs?

P: Number of odd degree vertices is even.
Q: Sum of degrees of all vertices is even.

A. P only B. Q only C**.** Both P and Q D. Neither P nor Q

51. In C programming language x- = y+1; means

a. x= x-y =1 b. x= - x- y-1 c. x= - x+y+1 d. x= x-y-1

52. Which of the following statements is syntactically correct?

a. for(); b. for(;); c. for(,); d. for(;;);

53. The statement printf (“%d”, (a++)); prints

a. the current value of a
b. the value of a+1
c. an error message
d. garbage

54. Consider the following statements (in C)

```
for (i=3; i<15;i+=3)
{
printf ("%d",i);
++i;
}
```

The execution of the above statements results in printing of

a. 3 6 9 12 b. 3 6 9 12 15 c. 3 7 11 d. 3 7 11 15

55. Identify the most appropriate sentence to describe unions
a. Union are like structures
b. Unions contain members of different data types which share the same storage area in memory
c. Unions are less frequently used in program
d. Unions are used for set operations

56. Which of the following system software resides in main memory always?
a. Text editor b. Assembler c. Linker d. Loader

57. What interrupt is generated when an attempt to divide by zero is made?
a. Supervisor call interrupt (SVC)
b. Program interrupt
c. I/O interrupt
d. Timer interrupt

58. Transfer of information to and from the main memory takes place in terms of
a. Bits b. Bytes c. Words d. Nibbles

59. Which of the following techniques is preferable for transferring large amount of data to and from a memory in a short time?
a. Programmed I/O
b. Interrupt driven I/O
c. DMA
d. None of the above

60. In a two pass assembler the object code generation is done during the
a. Second pass b.Firstpass
c.Zerothpass d.None of the above

61. What is the max cable length of STP?
a. 100 ft b. 200 ft c. 100 m d. 200 m

62. What is the central device in star topology?
a. STP server b. Hub/switch c. PDC d. Router

63. Error detection at data link level is achieved by
a. Bit stuffing
b. Cyclic Redundancy codes
c. Hamming code
d. Equalization

64. MySQL runs on which operating systems?
a. Linux and Mac OS-X only
b. Any operating system at all
c. Unix, Linux, Windows and others
d. Unix and Linux only

65. Which SQL statement is used to insert a new data in a database?
    a. INSERT INTO b. UPDATE c. ADD d. INSERT NEW

66. A table may be joined to itself.
    a. True
    b. false
    c. None of the above

67. Which of the following is not a valid aggregate function?
    a. COUNT
    b. MIN
    c. MAX
    d. COMPUTE

68. What SQL clause is used to restrict the rows returned by a query?
    a. AND
    b. WHERE
    c. HAVING
    d. FROM

69. A software process model is a representation of the way in which
    a. software is developed
    b. software processes data
    c. software is used
    d. software may fail

70. Choose one of the team organizations that will be best to generate more and better solutions
    a. Centralized
    b. Decentralized
    c. Synchronous
    d. Closed

71.If the bit string 0111101111101111110 is subjected to bit stuffing for the flag string 01111110, the output string is?

    a. 011110111110011111010
    b. 01111011111011111100
    c. 01111011111011111010
    d. 0111101111101111110

72.Which layer functions as liaison between user support layers and network support layers?

    a. network layer
    b. physical layer
    c. transport layer
    d. session layer

73.If the sequence of operations - push(1), push(2), pop, push(1), push(2), pop, pop, pop, push(2), pop are performed on a stack, the sequence of popped out values are ?

    a. 2, 2, 1, 1, 2

b. 2, 2, 1, 2, 2
c. 2, 1, 2, 2, 1
d. 2, 1, 2, 2, 2

74 .A binary tree that has n leaf nodes. The number of nodes of degree 2 in this tree is?

a. $\log_2 n$
b. n - 1
c. n
d. 2^n

75. Linked lists are suitable for which of the following problems?

a. Insertion sort
b. Binary search
c. Radix sort
d. Polynomial manipulation

76. In a Heap tree

a. Values in a node are greater than every value in left sub tree and smaller than right subtree.
b. Values in a node is greater than every value in children of it
c. Values in a node is lesser than every value in children of it
d. (b) or (c)

77. HTML is a subset of
a. SGMT
b. SGML
c. SAX
d. UDDI

78. In RDBMS, what is the efficient data structure used in the internal storage representation?
a. B+ Tree
b. Graph
c. Stack
d. Queue

79. A data structure where elements can be added or removed at either end but not in the middle
a. Linked lists b. Stacks c. Queues d. Dqueue

80. Which of the following data structure is non-linear type?
a. Strings b. Lists c. Stacks d. None of these

81. Which of the following sorting algorithm is of divide-and-conquer type?

a. Bubble sort
b. Insertion sort
c. Quick sort
d. All of above

82. An algorithm that calls itself directly or indirectly is known as
a. Sub algorithm
b. Recursion algorithm
c. Polish notation
d. Traversal

83. A page fault
a. is an error in a specific page
b. occurs when a program access a page of memory
c. is an access to a page not currently in memory
d. is a reference to a page belonging to another program

84. What problem is solved by Dijkstra's Banker's algorithm
a. Mutual exclusion
b. Deadlock recovery
c. Deadlock avoidance
d. Deadlock prevention

85. Thrashing
a. Is a natural consequence of virtual memory system
b. Can always be avoided by swapping
c. Always occurs on large computers
d. Can be caused by poor paging algorithms

86. USB stands for
a. Uniform System Bus
b. Utility and Support Board
c. Universal Synchronous Bus
d. Universal Serial Bus

87. The memory allocation scheme subject to external fragmentation is
a. segmentation
b. swapping
c. pure demand paging
d. contiguous fixed partition

88. Bluetooth supports upto __ meters
a. 100
b. 200
c. 10
d. 20

89. ETSI stands for
a. Electronic Telecommunications Standard Institute
b. Electronic Telecommunications Standard Industry
c. Electronic Telephone and Telegram Standard Industry

d. European Telecommunications Standard Institute

90. What are the two main standards for WLAN ?
   a. 802.11 and HIPERLAN
   b. 802.15 and 802.11
   c. 802.16 and HIPERLAN
   d. 802.3 and 802.1

91. Which of the following statements is wrong?
   a. RAM is a type of volatile
   b. Magnetic tape is non-volatile
   c. Magnetic core and semiconductor memories are used as mass memory medium
   d. An EPROM can be programmed , erased and reprogrammed by the user with and EPROM programming instrument

92. Which of the following sort algorithm operates in quadratic time relative to number of elements in the array (on the average)?
   a. Quick Sort b. Heap sort c. Bubble sort d.Radix sort

93. Compilers and interpreters are themselves
   a. high level languages
   b. programs
   c. codes
   d. mnemonics

94. The minimum number of nodes in a binary tree of height three is
   a. 7
   b. 12
   c. 3
   d. 15

95.In a Third Normal Form relation, every _____ attribute is non - transitively and fully dependent on the every candidate key?

   a. Prime
   b. Non Prime
   c. Unique
   d. None of these

96.A subtype discriminator is which of the following?
   a. An attribute of the supertype whose values determine the subtype
   b. An attribute of the subtype whose values determine the supertype.
   c. An attribute of the supertype whose values determine the supertype.
   d. An attribute of the subtype whose values determine the subtype

97.Which of the following is a tool in design phase ?

   a. Abstraction
   b. Refinement
   c. Information Hiding

d. All of Above

98.Which of the following is not a process metric ?

a. Productivity
b. Functionality
c. Quality
d. Efficiency

99.Spatial locality refers to the problem that once a location is referenced ?

a. It will not be referenced again
b. It will be referenced again
c. A nearby location will be referenced soon
d. None of Above

100. Which of the following are not reviewed in the various phases of the Spiral Model

a. Risk Analysis
b. Validation
c. Planning
d. Estimation