MCA – LET
(Final)

1. How would you round off a value from 1.66 to 2.0?

   (A) ceil(1.66) (B) floor(1.66)
   (C) roundup(1.66) (D) roundto(1.66)

2. Which of the following special symbol allowed in a variable name?

   (A) * (asterisk) (B) | (pipeline)
   (C) - (hyphen) (D) _ (underscore)

3. What will be the output of the following c program?

```
#include<stdio.h>
int main(){
int goto=5;
printf("%d",goto);
return 0;
}
```

   (A) 5 (B) 0
   (C) Compilation error (D) Stack overflow

4. Point out the error in the following program

```
#include<stdio.h>
int main()
void v = 0;
printf("%d", v);
return 0;
{
}
```

   (A) Error: Declaration syntax error 'v' (or) Size of v is unknown or zero
   (B) Program terminates abnormally
   (C) No error.
   (D) None of the above

5. Where was India's first computer installed and when?

   (A) Indian Institute of Technology, Delhi, 1977
   (B) Indian Institute of Science, Bangalore, 1971
   (C) Indian Iron and Steel Co. Ltd., 1968
   (D) Indian Statistical Institute, Calcutta, 1955

6. The octal equivalent of hexadecimal number 3DE is

(A) 1736 (B) 3176
(C) 1037 (D) All of the above

7. Which of the following is an example of non-volatile memory?

(A) ROM (B) VLSI
(C) LSI (D) RAM

8. Subtraction of 100101100_2 from 1110101010_2 is

(A) 1001011110_2 (B) 0110100001_2
(C) 1111000001_2 (D) 1111011111_2

9. The simplified form of the Boolean expression (X + Y + XY) (X + Z) is

(A) X + Y + Z (B) XY + YZ
(C) X + YZ (D) XZ + Y

10. A shift register can be used for

(A) parallel to series conversion (B) series to parallel conversion
(C) digital delay line (D) All of the above

11. In C a pointer variable to an integer can be created by the declaration

(A) int p* (B) int *p
(C) int –p (D) int $ p;

12. The braces that surround a code in a 'C' programme

(A) shows what code goes into a particular function
(B) delimits a section code
(C) separates the codes from a constant
(D) separates the file from the subject file

13. A programme contains the following declarations

```
int i, j;
long ix;
```

What would be the value of the following expression?

```
ix + j?
```

(A) integer (B) float
(C) long integer (D) double precision

14. If, i, j, k are integer variables with value 1, 2, 3 respectively, then what is the value of the expression

$$!((j + k) > (i + 5))$$

(A) 6 (B) 5
(C) 1 (D) 0

15. When a new element is inserted in the middle of a singly linked list, then

(A) only elements that appear after the new element need to be moved
(B) only elements that appear before the new element need to be moved
(C) elements that appear before and after the new element need to be moved
(D) None of the above

16. What will be the value of x and y after the execution of the following statement (C language) $n = 5, x = n++, y = –x$; ?

(A) 5, 4 (B) 6, 5
(C) 6, 6 (D) 5, 5

17. What will the SWAP macro in the following program be expanded to on preprocessing? Will the code compile?

```
#include<stdio.h>
#define SWAP(a, b, c)(c t; t=a, a=b, b=t)
int main()
{
int x=10, y=20;
SWAP(x, y, int);
printf("%d %d\n", x, y);
return 0;
}
```

(A) It compiles (B) Compiles with a warning
(C) Will not compile (D) Compiles and print nothing

18. In C++, what is the sign of character data type by default?

(A) Signed (B) Unsigned
(C) Implementation dependent (D) None of the above

19. What does inheritance allow you to do?

(A) Creates a class (B) Creates a hierarchy of classes
(C) Access methods (D) None of the above

20. Which of the following is used to implement the C++ interfaces?

(A) Absolute variables
(B) Abstract classes
(C) Constant variables
(D) None of the above

21. What is the output of this program?

```
#include
using namespace std;
int main()
{
int a;
a = 5 + 3 * 5;
cout << a;
return 0;
}
```

(A) 35
(B) 20
(C) 25
(D) 30

22. If the two strings are identical, then strcmp() function returns

(A) –1
(B) 1
(C) 0
(D) Yes

23. Point out the error in the following program.

```
#include<stdio.h>
struct emp
{
char name[20];
int age;
};
int main()
{
emp int xx;
int a;
printf("%d\n", &a);
return 0;
}
```

(A) Error: in printf
(B) Error: in emp int xx
(C) No error
(D) None of the above

24. In a 'C' programme, constant is defined

(A) before main
(B) after main
(C) anywhere, but starting on a new line
(D) None of the above

25. In C++ programme, an expression

(A) is a collection of data objects and operators that can be evaluated to a single value
(B) is a name that substitutes for a sequence of characters
(C) causes the computer to carry out some action
(D) All of the above

26. In C++ programme, consider the following arithmetic expression

$2*b + 3*(a-3)$

suppose a, b and c are integer variables that have been assigned the values $a = 8$, $b = 3$ and $c = -5$. What would be the value of this arithmetic expression?

(A) 45 (B) 6
(C) –16 (D) –1

27. How many times the while loop will get executed if a short int is 2 byte wide?

```
#include<stdio.h>
int main()
{
int j=1;
while(j <= 255)
{
printf("%c %d\n", j, j);
j++;
}
return 0;
}
```

(A) Infinite times (B) 255 times
(C) 256 times (D) 254 times

28. In mathematics and computer programming, which is the correct order of mathematical operators ?

(A) Addition, Subtraction, Multiplication, Division
(B) Division, Multiplication, Addition, Subtraction
(C) Multiplication, Addition, Division, Subtraction
(D) Addition, Division, Modulus, Subtraction

29. Which of the following function is correct that finds the length of a string?

(A)
```
int xstrlen(char *s)
{
int length=0;
while(*s!='\0')
{    length++; s++; }
return (length);
}
```

(B)
```
int xstrlen(char s)
{
int length=0;
while(*s!='\0')
length++; s++;
return (length);
}
```

(C)
```
int xstrlen(char *s)
{
int length=0;
while(*s!='\0')
length++;
return (length);
}
```

(D)
```
int xstrlen(char *s)
{
int length=0;
while(*s!='\0')
s++;
return (length);
}
```

30. What does your class can hold?

(A) Data
(B) Functions
(C) Both (A) and (B)
(D) None of the above

31. Identify the correct statement

(A) Namespace is used to group class, objects and functions
(B) Namespace is used to mark the beginning of the program
(C) Namespace is used to separate the class, objects
(D) None of the above

32. When writing comments you can

(A) use code and /* comment on the same line
(B) use code and // comments on the same line
(C) use code and //* comments on the same line
(D) use code and <!- comments on the same line

33. What is an array?

(A) An array is a series of elements of the same type in contiguous memory locations
(B) An array is a series of element
(C) An array is a series of elements of the same type placed in non-contiguous memory locations
(D) None of the above

34. How many types of constructor are there in C++?

(A) 1 (B) 2
(C) 3 (D) 4

35. What is meant by containership?

(A) Class contains objects of other class types as its members
(B) Class contains objects of other class types as its objects
(C) Both (A) and (B)
(D) None of the above

36. In a C++ programme, the continue statement should be written only

(A) in the body of a loop (B) in the nested loops
(C) outside the body of a loop (D) anywhere

37. In a C++ programme, a function can

(A) return a value
(B) perform a task
(C) change value of actual arguments in call by reference
(D) All of the above

38. Consider a linked list of n elements. What is the time taken to insert an element after an element pointed by some pointer?

(A) O(1) (B) $O(\log_2 n)$
(C) $O(n)$ (D) $O(n\log_2 n)$

39. The time required to search an element in a binary search tree having n elements is

(A) O(1) (B) $O(\log_2 n)$
(C) $O(n)$ (D) $O(n \log_2 n)$

40. Which of the following sorting algorithms does not have a worst case running time of $O(n^2)$?

(A) Insertion sort (B) Merge sort
(C) Quick sort (D) Bubble sort

41. A binary tree in which if all its levels except possibly the last, have the maximum number of nodes and all the nodes at the last level appear as far left as possible, is called

(A) full binary tree (B) 2-tree
(C) threaded tree (D) complete binary tree

42. What is the output of this program?

```
#include < iostream >
using namespace std;
#define PI 3.14159
int main ()
{
float r = 2;
float circle;
circle = 2 * PI * r;
cout << circle;
return 0;
}
```

(A) 12.566 (B) 13.566
(C) 10 (D) Compile time error

43. Following is a recursive function for computing the sum of integers from 0 to N.

```
function sum  (N : integer) : integer
                begin
                if (N == 0), then sum = 0;
                else
end;
```

The missing line in the else part is

(A) Sum : = N + Sum(N) (B) Sum : = N + Sum(N–1)
(C) Sum : = (N–1) + Sum(N) (D) Sum : = (N–1) + Sum(N–1)

44. Relational calculus is a

(A) Procedural language (B) Non- Procedural language
(C) Data definition language (D) High level language

45. Which one of the following is not a possible state for a pointer?

(A) Hold the address of the specific object
(B) Point one past the end of an object
(C) Zero
(D) Point to a type

46. DML is provided for

(A) Description of logical structure of database
(B) Addition of new structures in the database system
(C) Manipulation and processing of database
(D) Definition of physical structure of database system

47. Which of the following sorting algorithms yield approximately the same worst-case and average-case running time behaviour in O(n log$n$)?

(A) Bubble Sort and Selection Sort
(B) Heap Sort and Merge Sort
(C) Quick Sort and Radix Sort
(D) Tree Sort and Median-of-3 Quick Sort

48. Let $f: \{a, b\}^* \rightarrow \{a, b\}^*$ be given by $f(n) = ax$ for every value of $n \in \{a, b\}$ then f is

(A) one to one not onto
(B) one to one and onto
(C) not one to one and not onto
(D) not one to one and onto

49. The type of traversal through traversing a binary tree first root and then left and right subtrees is called

(A) postorder
(B) preorder
(C) inorder
(D) None of the above

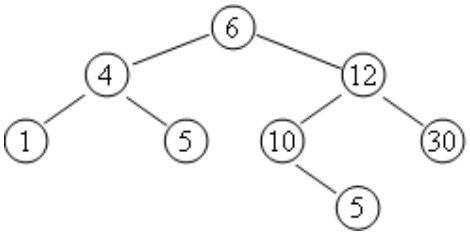
50. Identify the steps to be taken when a first node is to be deleted from linear linked list:
I. Set link of start pointer to the second node in the list
II. Free the space associated with first node
III. Obtain the address of the second node in the list
IV. Count the number of nodes in the list codes:

(A) I and II
(B) I, II and III
(C) II and III
(D) I, II, III and IV

51. Which of the following is NOT correct?

(A) $f(n) = O(f(n))$
(B) $c^* f(n) = O(f(n))$ for a constant c
(C) $O(f(n) + g(n)) = O(f(n)) + O(g(n))$
(D) $O((f(n))^2) = (O f(n))^2$

52. Consider the following tree



If this tree is used for sorting, then a new number 8 should be placed as the

(A) left child of node labelled 30
(B) right child of node labelled 5
(C) right child of node labelled 30
(D) left child of node labelled 10

53. Average search time for a sequential search of n items is

(A) $\frac{n}{2}$ (B) $\frac{(n-1)}{2}$

(C) $\frac{(n+1)}{2}$ (D) None of the above

54. Which of the following is useful in implementing quicksort?

(A) Stack (B) Set
(C) List (D) Queue

55. Stacks cannot be used to

(A) evaluate an arithmetic expression in postfix form
(B) implement recursion
(C) convert a given arithmetical expression in infix form to its equivalent postfix form
(D) allocate resources (like CPU) by the operating system

56. The number of functions from an m-element set to an n-element set is

(A) $m + n$ (B) m^n
(C) n^m (D) mn

57. Time taken for addition of element in queue is

(A) O(1) (B) O(n)
(C) O(log n) (D) None of the above

58. The smallest number of key that will force a B-tree of order three to have a height 3 is

(A) 12 (B) 10
(C) 7 (D) None of the above

59. A connected graph is one which

(A) cannot be partitioned without removing an edge
(B) contains at least three loops
(C) does not contain a cycle
(D) is not simple

60. The average time required to perform a successful sequential search for an element in an array A(1:n) is given by

(A) $\frac{n+1}{2}$ (B) $\frac{n(n+1)}{2}$

(C) $\log \frac{n}{2}$ (D) n^2

61. Queues serve a major role in

(A) simulation of recursion
(B) simulation of arbitrary linked list
(C) simulation of limited resource allocation
(D) expression evaluation

62. Which of the following sorting procedure is the slowest?

(A) Quick sort
(B) Heap sort
(C) Shell sort
(D) Bubble sort

63. The algorithm design technique used in the quick sort algorithm is

(A) Dynamic programming
(B) Backtracking
(C) Divide and conquer
(D) Greedy method

64. Breadth-first traversal (BFS) is a method to traverse

(A) all successors of a visited node before any successors of any of those successors
(B) a single path of the graph as far it can go
(C) graph using shortest path
(D) None of the above

65. The running time $T(n)$, where (n) is the input size of a recursive algorithm is given as follows:

$$T(n) = C + T(n-1); \text{ if } n > 1$$
$$= d \text{ if } n \leq 1$$

The order of algorithm is

(A) n^2
(B) n
(C) n^4
(D) n^n

66. The concept of order Big (O) is important because

(A) it can be used to decide the best algorithm that solves a given problem
(B) it determines the maximum size of a problem that can be solved in a given amount of time
(C) it is the lower bound of the growth rate of algorithm
(D) Both (A) and (B)

67. In compilers, the syntax analysis is done by

(A) lexical error
(B) scanner
(C) parser
(D) code generator

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

(A) merge sort
(B) bubble sort
(C) quick sort
(D) selection sort

69. The height of a binary tree is the maximum number of edges in any root-to-leaf-path. The maximum number of nodes in a binary tree of height h is

(A) 2^h
(B) $2^{h-1}-1$
(C) $2^{h+1}-1$
(D) 2^{h+1}

70. The in-order and pre-order traversal of a binary tree are *dbeafcg* and *abdecfg* respectively. The post-order traversal of the binary tree is

(A) *debfgca*
(B) *edbgfca*
(C) *edbfgca*
(D) *defgbca*

71. The five items: A, B, C, D and E are pushed in a stack, one after the other starting from A. The stack is popped four times and each element is inserted in a queue. Then two elements are deleted from the queue and pushed back on the stack. Now one item is popped from the stack. The popped item is

(A) A
(B) B
(C) C
(D) D

72. In a relational model, relations are termed as

(A) Tuples
(B) Attributes
(C) Tables
(D) Rows

73. In an E-R diagram attributes are represented by

(A) rectangle
(B) square
(C) ellipse
(D) triangle

74. The language which has recently become the defacto standard for interfacing application programs with relational database system is

(A) Oracle
(B) SQL
(C) DBase
(D) 4GL

75. The DBMS language component which can be embedded in a program is

(A) The data definition language
(B) The data manipulation language
(C) The database administrator
(D) A query language

76. An instance of relational schema R (A, B, C) has distinct values of A including NULL values. Which one of the following is true?

(A) A is a candidate key
(B) A is not a candidate key
(C) A is a primary Key
(D) Both (A) and (C)

77. To delete a particular column in a relation the command used is

(A) UPDATE
(B) DROP
(C) ALTER
(D) DELETE

78. The relation scheme student's performance (name, course no., roll no., grade) has the following dependencies.

Name, Course No. $\rightarrow$ Grade
Roll No., Course No. $\rightarrow$ Grade
Name $\rightarrow$ Roll No.
Roll No. $\rightarrow$ Name

The highest normal form of this relation scheme is

(A) 2 NF
(B) 3NF
(C) BCNF
(D) 4NF

79. Given the basic ER and relational models, which of the following is incorrect?

(A) An attribute of an entity can have more than one value
(B) An attribute of an entity can be composite
(C) In a row of a relational table, an attribute can have more than one value
(D) In a row of a relational table, an attribute can have exactly one value or a Null value

80. A data dictionary is a special file that contains

(A) names of all fields in all files
(B) data types of all fields in all files
(C) width of all fields in all files
(D) All of the above

81. Which of the following are not a function of a DBMS?

(A) Creating and processing forms
(B) Creating databases
(C) Processing data
(D) Administrating databases

82. Which of the following operation is used if we are interested in only certain columns of a table?

(A) PROJECTION
(B) SELECTION
(C) UNION
(D) JOIN

83. The full form of DDL is

(A) Dynamic Data Language
(B) Detailed Data Language
(C) Data Definition Language
(D) Data Derivation Language

84. A graph in which all nodes are of equal degree is called

(A) Multi graph
(B) Non regular graph
(C) Regular graph
(D) Complete graph

85. What is an operating system?

(A) Collection of programs that manages hardware resources
(B) System service provider to the application programs
(C) Link to interface the hardware and application programs
(D) All of the above

86. To access the services of operating system, the interface is provided by the

(A) System calls
(B) API
(C) Library
(D) Assembly instructions

87. Which one of the following is not true?

(A) Kernel is the program that constitutes the central core of the operating system
(B) Kernel is the first part of operating system to load into memory during booting
(C) Kernel is made of various modules which can not be loaded in running operating system
(D) Kernel remains in the memory during the entire computer session

88. Which scheduling algorithm allocates the CPU first to the process that requests the CPU first?

(A) First-come, first-served scheduling
(B) Shortest job scheduling
(C) Priority scheduling
(D) None of the above

89. CPU fetches the instruction from memory according to the value of

(A) Program counter
(B) Status registers
(C) Instruction register
(D) Program status word

90. Semaphore is a/an …….. to solve the critical section problem.

(A) Hardware for a system
(B) Special program for a system
(C) Integer variable
(D) None of the above

91. Which of the following refers to the associative memory?

(A) The address of the data is generated by the CPU
(B) The address of the data is supplied by the users
(C) There is no need for an address i.e. the data is used as an address
(D) The data is accessed sequentially

92. The process of transferring data intended for a peripheral device into a disk (or intermediate store) so that it can be transferred to peripheral at a more convenient time or in bulk, is known as

(A) multiprogramming
(B) spooling
(C) caching
(D) virtual programming

93. What is the name of the technique in which the operating system of a computer executes several programs concurrently by switching back and forth between them?

(A) Partitioning
(B) Multitasking
(C) Windowing
(D) Paging

94. What problem is solved by Dijkstra's banker's algorithm?

(A) mutual exclusion
(B) deadlock recovery
(C) deadlock avoidance
(D) cache coherence

95. A relationship between processes such that each has some part (critical section) which must not be executed while the critical section of another is being executed, is known as

(A) semaphore
(B) mutual exclusion
(C) multiprogramming
(D) multitasking

96. Distributed system should

(A) meet prescribed time constraints
(B) aim better resource sharing
(C) aim better system utilization
(D) aim low system overhead

97. Which of the following system calls results in sending of SYN packets?

(A) Socket
(B) Bind
(C) Listen
(D) Connect

98. Given the relations - employee (Name, Salary, Dept. No.) and department (Dept. No., Dept. Name, Address). Which of the following quarries cannot be expressed using the basic relational algebra operations (σ, π, ∞, $\cup$, $\cap$, $-$)

(A) Department address of every employee
(B) Employee whose name is the same as their department name
(C) The sum of all employee's salaries
(D) All the employees of a given department

99. The relational model consists of

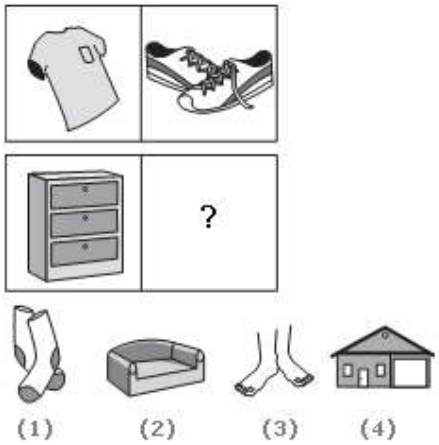
(A) data in the form of tables
(B) data redundancy
(C) operations using non-SQL languages
(D) unorganised data

100. For some relations, changing the data can have undesirable consequences called

(A) referential integrity constraints
(B) modification anomalies
(C) normal forms
(D) transitive dependencies

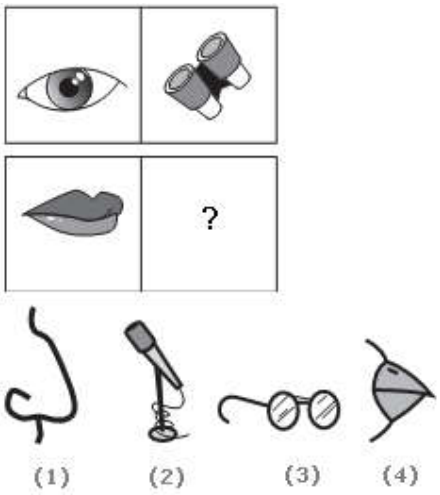
Direction (Qn. Nos. 101 – 105): Choose the picture that would go in the empty box so that the two bottom pictures are related in the same way as the top two are related.

101.



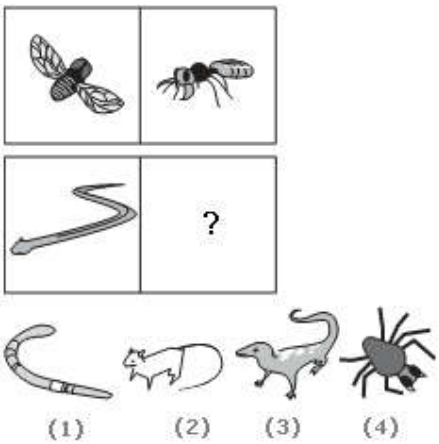
(A) 1
(B) 2
(C) 3
(D) 4

102.



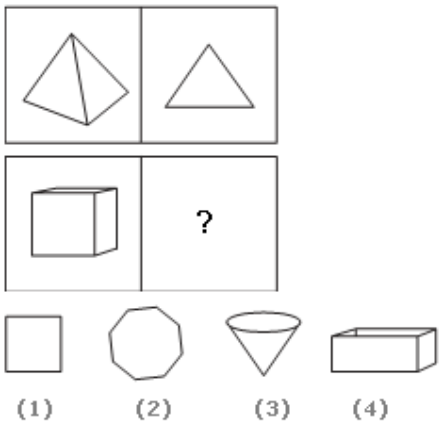
(A) 1
(B) 2
(C) 3
(D) 4

103.



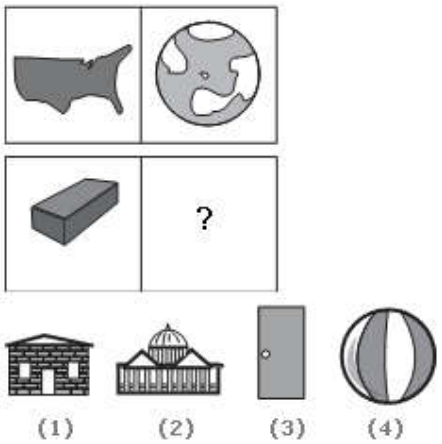
(A) 1
(B) 2
(C) 3
(D) 4

104.



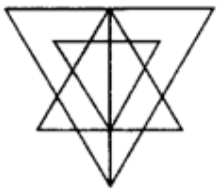
(A) 1 (B) 2
(C) 3 (D) 4

105.



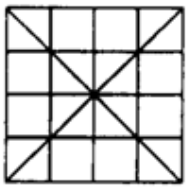
(A) 1 (B) 2
(C) 3 (D) 4

106. Count the number of triangles in the following figure:



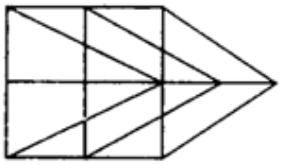
(A) 27 (B) 25
(C) 23 (D) 21

107. How many triangles does the following figure have?



(A) 36 (B) 40
(C) 44 (D) 48

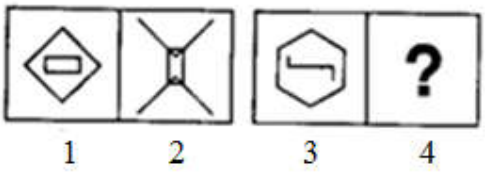
108. How many triangles and parallelograms are there in the following figure?

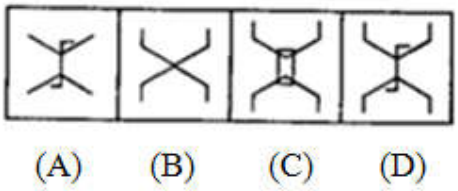


(A) 21, 17 (B) 19, 13
(C) 21, 15 (D) 19, 17

Direction (Qn. 109 and 110): In the following, there is a definite relationship between figure 1 and 2. Choose the best alternative which will establish a similar relationship between 3 and 4.

109.



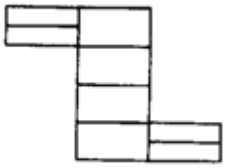


110.

1 2 3 4

(A) (B) (C) (D)

111. Count the number of rectangles in the following figure:



(A) 8 (B) 17
(C) 18 (D) 20

Direction (Qn. Nos. 112 – 118): In each of the following questions, one term in the number series is wrong. Find out the wrong term.

112. 196, 169, 144, 121, 80

(A) 80 (B) 121
(C) 169 (D) 196

113. 3, 7, 15, 39, 63, 127, 255, 511

(A) 15 (B) 39
(C) 63 (D) 127

114. 11, 5, 20, 12, 40, 26, 74, 54

(A) 5 (B) 20
(C) 40 (D) 26

115. 56, 72, 90, 110, 132, 150

(A) 72 (B) 90
(C) 110 (D) 150

116. 105, 85, 60, 30, 0, –45, –90

(A) 105 (B) 60
(C) 0 (D) –45

117. 3, 10, 27, 4, 16, 64, 5, 25, 125

(A) 3 (B) 4
(C) 10 (D) 27

118. 5, 27, 61, 122, 213, 340, 509

(A) 27 (B) 61
(C) 122 (D) 509

119. In a code, CORNER is written as GSVRIV. How can CENTRAL be written in that code?

(A) DFOUSBM (B) GIRXVEP
(C) GJRYVEP (D) GNFJKER

120. If CIGARETTE is coded as GICERAETT, then DIRECTION will be coded as

(A) RIDTCENOI (B) NORTECDII
(C) NOIETCRID (D) IRDCTIONE

Direction (Qn. Nos. 121 – 125): In questions given below out of four alternatives, choose the one which can be substituted for the given word/sentence.

121. Extreme old age when a man behaves like a fool

(A) Imbecility (B) Senility
(C) Dotage (D) Superannuation

122. That which cannot be corrected

(A) Unintelligible (B) Indelible
(C) Illegible (D) Incorrigible

123. The study of ancient societies

(A) Anthropology (B) Archaeology
(C) History (D) Ethnology

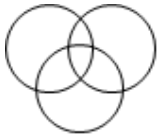
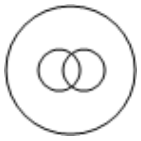
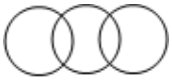
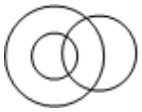
124. State in which the few govern the many

(A) Monarchy (B) Oligarchy
(C) Plutocracy (D) Autocracy

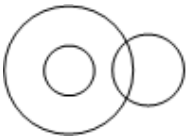
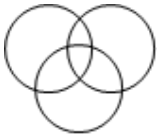
125. One who eats everything

(A) Omnivorous
(B) Omniscient
(C) Irrestible
(D) Insolvent

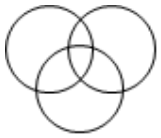
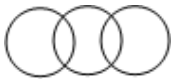
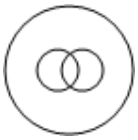
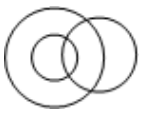
126. Which one of the following diagrams correctly represents the relationship among the classes: Tennis fans, Cricket players, Students?

(A) 
(B) 
(C) 
(D) 

127. Which one of the following Venn diagrams best illustrates the three classes: Rhombus, Quadrilaterals, Polygons?

(A) 
(B) 
(C) 
(D) 

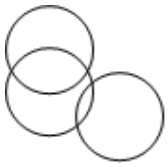
128. Which is the most suitable Venn diagram among the following, which represents interrelationship among Antisocial elements, Pick pockets and Black mailers?

(A) 
(B) 
(C) 
(D) 

129. Which one of the following four logical diagrams represents correctly the relationship between: Musicians, Instrumentalists, Violinists?

(A) 

(B) 

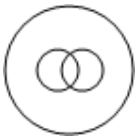
(C) 

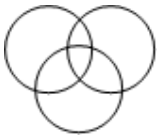
(D) 

130. Which of the following gives the proper relation of *Tall men, Black haired people, Indians*?

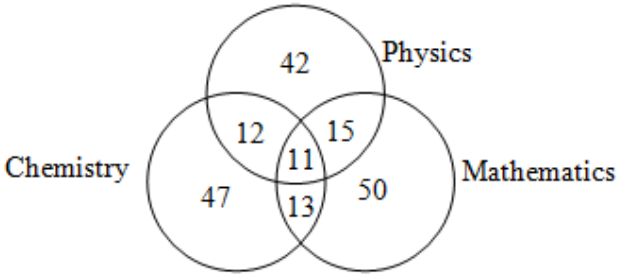
(A) 

(B) 

(C) 

(D) 

Direction (Qn. Nos. 131 – 133): The diagram given below shows the number of students who got distinction in three subjects out of 500 students. Study the diagram carefully and answer the questions that follow.



131. What is the percentage of students who got distinction in two subjects?

(A) 8% (B) 9%
(C) 10% (D) 12%

132. What is the percentage of students who got distinction?

(A) 28% (B) 35%
(C) 38% (D) 40%

133. The percentage of students with distinction marks in Mathematics is

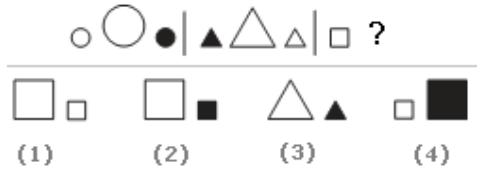
(A) 17.8% (B) 18.6%
(C) 19.2% (D) 20.6%

Direction (Qn. Nos. 134 – 136): Look carefully at the sequence of symbols to find the pattern. Select correct pattern.

134.

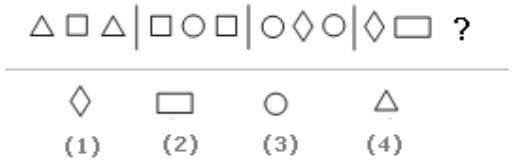
(A) 1 (B) 2
(C) 3 (D) 4

135.



(A) 1 (B) 2
(C) 3 (D) 4

136.



(A) 1 (B) 2
(C) 3 (D) 4

Direction (Qn. Nos. 137 and 138): In these series, you will be looking at both the letter pattern and the number pattern. Fill the blank in the middle of the series or end of the series.

137. SCD, TEF, UGH, ____, WKL

(A) CMN (B) UJI
(C) VIJ (D) IJT

138. CMM, EOO, GQQ, _____, KUU

(A) GRR
(B) GSS
(C) ISS
(D) ITT

139. If $A = \left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, ...\right\}$ and N = {1, 2, 3, ...} the function $f : N \to A$ defined by $f(n) = \frac{n}{n+1}$ is

(A) one-one only
(B) onto only
(C) constant function
(D) one-to-one and onto

140. If A and B are any two sets then $A \subseteq B$ if and only if

(A) $B' \subseteq A'$
(B) $B' \subseteq A$
(C) $A' \subseteq B$
(D) $A' \subseteq B'$

141. A root of the equation $x^3 - 6x^2 + 11x - 6 = 0$ is

(A) 1
(B) –1
(C) i
(D) $-i$

142. Among 50 students, 26 passed in Maths and 21 passed in Science. If 17 did not pass in both, how many passed in both?

(A) 14
(B) 3
(C) 21
(D) 12

143. Inverse of $\begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$ is

(A) $\begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$
(B) $\begin{bmatrix} 2 & -1 \\ -1 & 1 \end{bmatrix}$
(C) $\begin{bmatrix} 2 & 1 \\ 1 & -1 \end{bmatrix}$
(D) $\begin{bmatrix} 2 & -1 \\ -1 & -1 \end{bmatrix}$

144. The system of equations $x + 2y = 3, \quad 2x + 4y = 6$ have

(A) unique solution
(B) no solution
(C) infinite solutions
(D) None of the above

145. $\lim_{x \to 2} \frac{x^5 - 32}{x - 2} =$

(A) 18
(B) 80
(C) 16
(D) 32

146. If $f(x) = x^2 - 2x + 5$, then

(A) $f(x) \geq 4$ (B) $f(x) \leq 4$
(C) $f(x) = 4$ (D) None of the above

147. The value of $1 - \frac{x}{1!} + \frac{x^2}{2!} - \frac{x^3}{3!} + \ldots$ is

(A) $\sin x$ (B) $\cos x$
(C) $\log x$ (D) e^{-x}

148. $1^3 + 2^3 + 3^3 + \ldots + n^3$ is

(A) $\frac{n^4}{4}$ (B) $\frac{n^2(n+1)^2}{4}$

(C) $\frac{n^2(n+1)(2n+1)}{6}$ (D) $\frac{n^2(2n+1)^2}{8}$

149. A single letter is selected at random from the word "probability". The probability that it is a vowel is

(A) $\frac{2}{11}$ (B) $\frac{4}{11}$

(C) $\frac{3}{11}$ (D) 0

150. $\begin{bmatrix} 1 & 2 \\ 2 & 0 \end{bmatrix}$ is

(A) Symmetric (B) Skew-symmetric
(C) Singular (D) Of order 3

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