MVOC SOFTWARE APPLICATIONS DEVELOPMENT
(FINAL)

1. The number of integers that lie between -2π and 2π is

   (A) 6
   (B) 7
   (C) 12
   (D) 13

2. Sum of the series $\dfrac{1}{1\cdot 2}+\dfrac{1}{2\cdot 3}+\dfrac{1}{3\cdot 4}+...+\dfrac{1}{99\cdot 100}$ is

   (A) 1

   (B) $\dfrac{99}{100}$

   (C) $\dfrac{99!}{100}$

   (D) $\dfrac{101}{100}$

3. Solution of the differential equation $\dfrac{d^2y}{dx^2}+\dfrac{dy}{dx}=1$ is

   (A) $\sin x + x$
   (B) $e^{-x}+1$
   (C) $e^{x}+x$
   (D) $e^{-x}+x$

4. The rank of the subspace of R^4 spanned by $(1,-1,0,0)$, $(0,1,-1,0)$, $(0,0,1,-1)$ is

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

5.   Suppose ABC is an equilateral triangle with $A = (1, 0)$, $B = (-1, 0)$. Then C can be

(A) $(0, 1)$

(B) $\left(0, \sqrt{2}\right)$

(C) $\left(0, \dfrac{\sqrt{3}}{2}\right)$

(D) $\left(0, \sqrt{3}\right)$

6.   The number of points (x, y) with integer coordinates that satisfy the inequalities $x \geq 0, \ y \geq 0, \ x + y \leq 10$ is

(A) 45
(B) 55
(C) 66
(D) 100

7.   The value of $\displaystyle\int_{0}^{\infty} x^4 e^{-x} dx$ is

(A) 1
(B) 6
(C) 24
(D) 0

8.   The value of $\displaystyle\sum_{j=0}^{5} \frac{6!}{j!(6-j)!}$ is

(A) 31
(B) 32
(C) 63
(D) 64

9.   The length of the side of the largest square that fits inside a circle of radius one is

(A) $\dfrac{1}{\sqrt{2}}$

(B) 1

(C) $\sqrt{2}$

(D) 2

10.   A fair coin (with equal probability of heads and tails) is tossed six times. The probability of getting at least two heads is

(A) $\dfrac{15}{64}$

(B) $\dfrac{63}{64}$

(C) $\dfrac{1}{3}$

(D) $\dfrac{57}{64}$

11.   For any sets A, B and C, $(A \cup B) \cap (A \cup C) =$

(A) $A \cup (B \cap C)$
(B) $(A \cup B) \cup C$
(C) $A \cap (B \cup C)$
(D) $(A \cap B) \cap C$

12.   The domain of the real-valued function $\sqrt{(x-a)(x-b)(x-c)}$ when $a < b < c$ is

(A) $(-\infty, a] \cup [b, c]$
(B) $[a, b] \cup [c, \infty)$
(C) $(-\infty, a] \cup [c, \infty)$
(D) $[a, c]$

13. Consider the function $f : \mathbb{R} \to \mathbb{R}$ defined by

$$f(x) = \begin{cases} \dfrac{1}{q} & \text{if } x \text{ is rational and } x = \dfrac{p}{q} \text{ in lowest terms} \\ 0 & \text{otherwise} \end{cases}$$

Then the set

$$\{x \in \mathbb{R} \mid f \text{ is continuous at } x\}$$

is equal to

(A) ϕ (the empty set)
(B) $\mathbb{Q}$
(C) $\mathbb{R} - \mathbb{Q}$
(D) $\mathbb{R}$

14. The number of real solutions for the equation $\sin x = \dfrac{x}{3}$ is

(A) 0
(B) 1
(C) 2
(D) 3

15. The sum of the series $r^2 + \dfrac{r^2}{1+r^2} + \dfrac{r^2}{\left(1+r^2\right)^2} + \dots$ is

(A) 1

(B) $\left(1+r^2\right)$

(C) $\left(1+r^2\right)^{-1}$

(D) $\left(1-r^2\right)^{-1}$

16. $\displaystyle\lim_{n \to \infty} n\left(\sqrt[n]{x} - 1\right)$ for $x > 0 =$

(A) e^x
(B) 1
(C) x
(D) $\log x$

17. $\lim\limits_{x \to 0} \dfrac{1-\cos x}{x^2} =$

    (A)   0

    (B) $\dfrac{1}{2}$

    (C)   1

    (D)   2

18. The remainder when $1! + 2! + 3! + ... + 10!$ is divided by 4 is

    (A)   0
    (B)   1
    (C)   2
    (D)   3

19. The expression $(1+2)(1+2^2)(1+2^4)(1+2^8)(1+2^{16})$ is equal to

    (A) $2^{17} - 1$
    (B) $2^{33} - 2^{32}$
    (C) $2^{16} + 2^8 + 2^4 + 2^2 + 2$
    (D) $2^{32} - 1$

20. The degree of a polynomial $p(x)$ satisfying $p(p(x)) = p(x)$ is

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

21. The number of real roots of the equation $x^3 - 2x^2 + 3x - 7 = 0$ is

    (A)   0
    (B)   1
    (C)   2
    (D)   3

22. A class of ten students is going on a school trip. The number of ways of organizing these students into 5 pairs is

(A) 10!

(B) $\dfrac{10!}{5!5!}$

(C) 45

(D) 1×3×5×7×9

23. Suppose $f(x)$ is a polynomial, and a and b are distinct numbers. Then the remainder when $f(x)$ is divided by $x^2 - (a+b)x + ab$ is

(A) $(a-b)(b-x) - \dfrac{f(a)-f(b)}{a-b}(a-x) + f(a)$

(B) $\dfrac{f(a)-f(b)}{a-b}(x-a) + f(a)$

(C) $\dfrac{f(a)-f(b)}{a-b}$

(D) $\dfrac{f(a)-f(b)}{a-b} + xf(a)$

24. The determinant of the 10×10 matrix whose $(i, j)^{th}$ entry is $\max(i, j)$ is

(A) 0
(B) 1
(C) −10
(D) 10

25. Which of the following matrices has no real eigenvector?

(A) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

(B) $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

(C) $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

(D) $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

26. The cardinality of the set $\{(x,y)\in \mathbb{N}^2 \mid (2-x)(2+y) > 2(y-x)\}$ is

(A) 4
(B) 5
(C) 6
(D) ∞

27. Let $S = \left\{(a,b)\in \mathbb{N}^2 \mid \dfrac{(a+1)(a+2b)}{2} \in \mathbb{N}\right\}$. Then

(A) $S = \phi$
(B) S is a finite subset of $\mathbb{N}^2$
(C) S is a infinite proper subset of $\mathbb{N}^2$
(D) $S = \mathbb{N}^2$

28. $\displaystyle\lim_{n\to\infty}\prod_{k=2}^{n} \frac{k^3-1}{k^3+1} =$

(A) 0
(B) 1
(C) $\dfrac{2}{3}$
(D) $\dfrac{3}{2}$

29. Let $T: R^n \to R^n$ be the linear transformation given by $T(e_i) = e_{i+1}$ for $i=1,...,n-1$, $T(e_n) = e_1$. Then the characteristic polynomial of the matrix of T is

(A) $(t-1)^n$
(B) $1-t^n$
(C) $1+t+...+t^n$
(D) $t^n - 1$

30. The number of non-negative integer solutions of the equation $x_1 + x_2 + x_3 = 5$ is

(A) 10
(B) 15
(C) 18
(D) 21

31. A relation *R* on a set *S*, defined as *x R y* if and only if *y R x*. This is an example of

(A) reflexive relation
(B) symmetric relation
(C) transitive relation
(D) invalid relation

32. What is the condition for an equivalence relation if two cities are related within a country?

(A) The two cities should have a one-way connection
(B) The two cities should have a two-way connection
(C) The two cities should be in different countries
(D) No equivalence relation will exist between two cities

33. Five node splitting operations occurred when an entry is inserted into a B-tree. Then how many nodes are written?

(A) 14
(B) 7
(C) 11
(D) 5

34. What is the space complexity of searching in a heap?

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

35. Given an array of element 5, 7, 9, 1, 3, 10, 8, 4. Which of the following are the correct sequences of elements after inserting all the elements in a min-heap?

(A) 1, 3, 4, 5, 7, 8, 9, 10
(B) 1, 4, 3, 9, 8, 5, 7, 10
(C) 1, 3, 4, 5, 8, 7, 9, 10
(D) 1, 3, 7, 4, 8, 5, 9, 10

36. Which of the following is used in hash tables to determine the index of any input record?

(A) hash function
(B) hash linked list
(C) hash tree
(D) hash chaining

37. Which of the following technique stores data in a separate entity in case of a collision?

   (A) Open addressing
   (B) Chaining using doubly linked list
   (C) Linear probing
   (D) Double hashing

38. What is the worst case time complexity of inserting a node in a doubly linked list?

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

39. Evaluate the postfix expression $ab + cd/-$ where $a = 5, b = 4, c = 9, d = 3$

   (A) 23
   (B) 15
   (C) 6
   (D) 10

40. Which application of stack is used to ensure that the pair of parentheses is properly nested?

   (A) Balancing symbols
   (B) Reversing a stack
   (C) Conversion of an infix to postfix expression
   (D) Conversion of an infix to prefix expression

41. Which of the following is **NOT** a stable sorting algorithm?

   (A) Bubble Sort
   (B) Insertion Sort
   (C) Selection Sort
   (D) Quick Sort

42. Which of the following data structures uses LIFO (Last In First Out) principle?

   (A) Queue
   (B) Stack
   (C) Linked List
   (D) Array

43. Which of the following searching algorithms requires a sorted input array?

   (A) Linear Search
   (B) Binary Search
   (C) Depth-First Search
   (D) Breadth-First Search

44. Which of the following is an example of a Greedy algorithm?

   (A) Depth-First Search
   (B) Dijkstra's Algorithm
   (C) Kruskal's Algorithm
   (D) Prim's Algorithm

45. What is the time complexity of searching an element in an unsorted array?

   (A) $O(1)$
   (B) $O(\log n)$
   (C) $O(n)$
   (D) $O(n^2)$

46. Which statement is true for stacks?

   (A) Elements are stored in a first-in-first-out (FIFO) order
   (B) Insertion and deletion can be performed at both ends
   (C) Insertion and deletion are performed in a last-in-first-out (LIFO) order
   (D) None of the above

47. In the following which is **NOT** a queue?

   (A) Priority queue
   (B) Circular queue
   (C) Double-ended queue
   (D) Depth-first queue

48. What is the maximum height of a binary search tree with n nodes?

   (A) n
   (B) $\log n$
   (C) $n \log n$
   (D) $2n$

49. Which of the following is true for trees?

    (A) A tree with n nodes has $n - 1$ edges
    (B) A tree can have multiple roots
    (C) A binary tree can have at most three children for each node
    (D) None of the above

50. Which of the following is true for graphs?

    (A) A graph can be directed or undirected
    (B) A graph cannot have cycles
    (C) A graph cannot have self-loops
    (D) None of the above

51. Which of the following algorithms is used to find the shortest path in a weighted graph?

    (A) Depth-first search
    (B) Breadth-first search
    (C) Dijkstra's algorithm
    (D) Prim's algorithm

52. In the following one of the page replacement algorithm is NOT a valid. Find it ?

    (A) FIFO
    (B) LRU
    (C) OPT
    (D) MFU

53. Which of the following scheduling algorithms provides better response time?

    (A) Priority scheduling
    (B) Round Robin scheduling
    (C) FCFS scheduling
    (D) SJF scheduling

54. The most efficient I/O scheduling algorithm is ……………….

    (A) FCFS
    (B) SCAN
    (C) C-SCAN
    (D) LOOK

55. Which protocol is used for secure communication over the internet?

  (A) SMTP
  (B) FTP
  (C) HTTPS
  (D) Telnet

56. Identify the protocol used for email transmission?

  (A) TCP
  (B) HTTP
  (C) SMTP
  (D) POP

57. Which device is used to connect multiple computers on a LAN?

  (A) Router
  (B) Switch
  (C) Hub
  (D) Modem

58. Identify the device used to connect multiple networks?

  (A) Router
  (B) Modem
  (C) Hub
  (D) Switch

59. Name the most widely used protocol on the internet for transmitting data between web servers and clients?

  (A) HTTP
  (B) FTP
  (C) SMTP
  (D) DNS

60. Which protocol used to translate domain names into IP addresses?

  (A) DNS
  (B) HTTP
  (C) SMTP
  (D) FTP

Direction (Question 61 to 65): Read the passage and answer the following questions.

Mahatma Gandhi believed that industrialisation was no answer to the problems that plague the mass of India's poor and that villagers should be taught to be self-sufficient in food, weave their own cloth from cotton and eschew the glittering prizes that the 20th century so temptingly offers. Such an idyllic and rural paradise did not appear to those who inherited the reins of political power.

61. The meaning of 'glittering prizes that the 20th century so temptingly offers' is

    (A) pursuit of a commercialised material culture
    (B) replacement of rural by urban interests
    (C) complete removal of poverty
    (D) absence of violence and corruption

62. The basis of 'an idyllic and rural paradise' is

    (A) rapid industrialisation of villages
    (B) self-sufficiency in food clothes and simplicity of the lifestyle
    (C) bringing to the villages the glittering prizes of the 20th century
    (D) supporting those holdings powerful political positions

63. Which one of the following best illustrates the relationship between the phrases?

    (i)   'eschew the glittering prizes'
    (ii) 'idyllic and rural paradise'

    (A) unless you do (i), you cannot have (ii)
    (B) (i) and (ii) are identical in meaning
    (C) first of all you must have (ii) in order to do (i)
    (D) the meaning of (i) is directly opposite to (ii)

64. Mahatma Gandhi's views opposed industrialisation of villages because it would

    (A) help the poor and not the rich
    (B) take away the skill of the villagers
    (C) affect the culture of the Indians
    (D) undermine self-sufficiency and destroy the beauty of life of the villager

65. Mahatma Gandhi's dream of 'an idyllic and rural paradise' was not shared by

   (A) those who did not believe in the industrialisation of the country
   (B) those who called him the Father of Nation
   (C) those who inherited political powers after independence
   (D) those who believed that villages should be self-sufficient in food and cloth

Direction: Read the passage and answer the following questions.

Nehru's was a many sided personality. He enjoyed reading and writing books as much as he enjoyed fighting political and social evils or residing tyranny. In him, the scientist and the humanist were held in perfect balance. While he kept looking at special problems from a scientific standpoint. He never forgot that we should nourish the total man. As a scientist, he refused to believe in a benevolent power interested in men's affairs. But, as a self proclaimed non-believer, he loved affirming his faith in life and the beauty of nature. He adored children. Unlike Wordsworth, he did not see them trailing clouds of glory from the recent sojourn in heaven. He saw them as a blossoms of promise and renewal, the only hope for mankind.

66. Nehru thought that children

   (A) were tailing clouds of glory
   (B) held promise for a better future
   (C) were like flowers to be loved and admired
   (D) held no hope for mankind

67. Nehru enjoyed

   (A) reading and writing books
   (B) fighting political and social evils
   (C) resisting tyranny
   (D) doing all the above and much more

68. Which of the statements reflects Nehru's point of view?

   (A) Humanism is more important than science
   (B) Science is supreme and humanism is subordinate to it
   (C) Science and humanism are equally important
   (D) There is no ground between science and humanism

69. In this passage, 'a benevolent power interested in men's affairs' means

(A) a supernatural power of god
(B) beauty of nature
(C) the spirit of science
(D) the total man

70. A 'many-side personality' means a

(A) complex personality
(B) secretive person
(C) person having varied interests
(D) capable person

Direction: Read the passage and answer the following questions.

Nationalism, of course, is a curious phenomenon which at a certain stage in a country's history gives life, growth and unity but, at the same time, it has a tendency to limit one, because one thinks of one's country as something different from the rest of world. One's perspective changes and one is continuously thinking of one's own struggles and virtues and failing to the exclusion of other thoughts. The result is that the same nationalism which is the symbol of growth for a people becomes a symbol of the cessation of that growth in mind. Nationalism, when it becomes successful sometimes goes on spreading in an aggressive way and becomes a danger internationally. Whatever line of thought you follow, you arrive at the conclusion that some kind of balance must be found. Otherwise something that was good can turn into evil. Culture, which is essentially good become not only static but aggressive and something that breeds conflict and hatred when looked at from a wrong point of view. How are you to find a balance, I don't know. Apart from the political and economic problems of the age, perhaps, that is the greatest problem today because behind it there is tremendous search for something which it cannot find. We turn to economic theories because they have an undoubted importance. It is folly to talk of culture or even of god when human beings starve and die. Before one can talk about anything else one must provide the normal essentials of life to human beings. That is where economies comes in. Human beings today are not in mood to tolerate this suffering and starvation and inequality when they see that the burden is not equally shared. Others profit while they only bear the burden.

71. The greatest problem in the middle of the passage refers to the question how to

(A) mitigate hardship to human beings
(B) contain the dangers of aggressive nationalism
(C) share the economic burden equally
(D) curb international hatred

72. Negative national feeling can make a nation

   (A) selfish
   (B) self-centred
   (C) indifferent
   (D) dangerous

73. Suitable title for this passage can be

   (A) Nationalism breeds unity
   (B) Nationalism - a road to world unity
   (C) Nationalism is not enough
   (D) Nationalism and national problems

74. 'Others' in the last sentence refers to

   (A) other people
   (B) other nations
   (C) other communities
   (D) other neighbours

75. Aggressive nationalism

   (A) breeds threat to international relations
   (B) leads to stunted growth
   (C) endangers national unity
   (D) isolates a country

Direction (Question 76 to 79): Read the passage and answer the following questions.

Many sociologists have argued that there is functional relationship between education and economic system. They point to the fact that mass formal education began in industrial society. They note that the expansion of the economies of industrial societies is accompanied by a corresponding expansion of their educational systems. They explain this correspondence in terms of the needs of industry for skilled and trained manpower, needs which are met by the educational system. Thus, the provision of mass elementary education in Britain in 1870 can be seen as a response to the needs of industry for a literate and numerate workforce at a time when industrial processes were becoming more complex and the demand for technical skills was steadily growing.

76. The industry needs a literate work-force because

    (A) its expansion needs sound learning
    (B) it relies heavily on expertise
    (C) it promotes a competitive spirit
    (D) its operations need intricate technical knowledge

77. The author argues that

    (A) formal education can be traced to industrial society
    (B) industrial society is responsible for expansion of education at mass level
    (C) industrial society gave rise to vocational education
    (D) industrial society changed the pattern of education

78. The observation of the Sociologists are based on a study of

    (A) the statistical data available in a historical context
    (B) economic system of the 19th century
    (C) the correlation between industry and education in a historical context
    (D) growth of industry during 19th century

79. The Sociologists referred to in the passage say that the relationship between industry and elementary education was one

    (A) based on mutual need
    (B) based entirely on the need of the industry
    (C) based entirely on economic need
    (D) based on some inexplicable historical forces

80. **Direction**: Choose the word which is most nearly the **opposite** in meaning as the word shown in bold letters below

    Lofty

    (A) Deserted
    (B) Imposing
    (C) Solitary
    (D) Lowly

81. **Direction**: Choose the word which is most nearly the **opposite** in meaning as the word shown in bold letters below

   Indigenous

   (A) Local
   (B) Domestic
   (C) Island
   (D) Foreign

82. **Direction**: Choose the word which is most nearly the **opposite** in meaning as the word shown in bold letters below

   Intrepid

   (A) Audacious
   (B) Acquired
   (C) Evident
   (D) Bashful

83. Choose the best alternative for the underlined part of the sentence, by identifying the error in it, if any

   The woodland sub-species were **in isolation from contact with humans longer than** either their marsh cousins or the tree-dwelling sub-species

   (A) in isolation from contact with humans longer than
   (B) isolated from contact with humans longer than
   (C) in isolation from contact with humans longer than were
   (D) isolated from contact with humans longer than were

84. **Direction**: Fill in the blanks

   Her talk was so interesting that Rajeev was…………..

   (A) pent up
   (B) all ears
   (C) very tense
   (D) listening

85. **Direction**: Find the part of the sentence with error (Ignore errors of punctuation, if any)

    The speaker left the scene before long

    (A) The speaker
    (B) left the scene
    (C) before long
    (D) No error

86. **Direction**: Choose the phrase that best expresses the meaning of the underlined idiom

    It was <u>a red-letter day</u> in the history of the world

    (A) A day remembered for some joyful event
    (B) A day noted for bloodshed
    (C) A day of warmth and love
    (D) A day of dispute

87. **Direction**: Choose the appropriate question tag

    We haven't finished our work yet, …………

    (A) did we?
    (B) don't we?
    (C) haven't we?
    (D) have we?

88. **Direction**: Choose the word which is most nearly the same in meaning as the word given in bold letters

    Reconnaissance

    (A) Investigation
    (B) Death
    (C) Recognizable
    (D) Adoption

89. **Direction**: Choose the word which is most nearly the same in meaning as the word given in bold letters
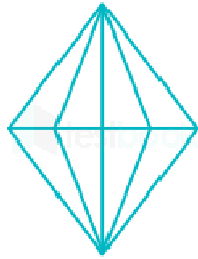
    Nimble

    (A) Clumsy
    (B) Honest
    (C) Needless
    (D) Agile

90. **Direction**: Choose the word which is most nearly the same in meaning as the word given in bold letters

Proliferation

(A) Explosion
(B) Devastation
(C) Discomfiture
(D) Abundance

91. How many triangles are there in the below given figure?

(A) 13
(B) 32
(C) 21
(D) 24

92. *X* introduces *Y* saying 'He is the husband of the granddaughter of the father of my father'. How is *Y* related to *X*?

(A) Brother
(B) Uncle
(C) Co-brother
(D) Brother-in-law

93. Complete the analogy.

Paisa : Rupee :: ? : Kilometre

(A) Metre
(B) Hectometre
(C) Quintal
(D) Decametre

94. **Direction**: The given question presents a situation and asks you to make a judgment regarding that particular circumstance. Choose an answer based on the given information

The school principal has received complaints from parents about bullying in the school yard during recess. He wants to investigate and end this situation as soon as possible, so he has asked the recess aides to watch closely. Which situation should the recess aides report to the principal?

(A) A girl is sitting glumly on a bench reading a book and not interacting with her peers
(B) Four girls are surrounding another girl and seem to have possession of her backpack
(C) Two boys are playing a one-on-one game of basketball and are arguing over the last basket scored
(D) Three boys are huddled over a handheld video game, which isn't supposed to be on school grounds

95. **Direction**: Fill in the blanks

SCD, TEF, UGH, …………., WKL

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

96. **Direction**: Complete the following series by choosing the correct option from the given alternatives

ZA_5, Y_4B, XC_6, W_3D, ………….

(A) E_7V
(B) V_2E
(C) VE_5
(D) VE_7

97. If 'air' is called 'green', 'green' is called 'red', 'red' is called 'sea', 'sea' is called 'blue', 'blue' is called 'water' and 'water' is called 'pink', then what is the color of grass?

(A) Green
(B) Air
(C) Red
(D) Pink

98. Read the following information to answer the given question

- A B C D E F are sitting in a row
- E and F are in the center, A and B are at the ends
- C is sitting on the left of A

Who is sitting three places on the right of D?

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

99. The angle between the hour hand and minute hand of a clock at 3:40 pm is

(A) 120°
(B) 110°
(C) 130°
(D) 105°

100. January 1, 1995 was Sunday. What day of the week lies on January 1, 1996?

(A) Sunday
(B) Monday
(C) Wednesday
(D) Saturday

101. Which of the following words does **NOT** belong in the group?

(A) Acorn
(B) Pecan
(C) Hazelnut
(D) Olive

102. Which of the following words does **NOT** belong in the group?

(A) Pine
(B) Birch
(C) Oak
(D) Ash

103. Which of the following words does **NOT** belong in the group?

(A) Laptop
(B) Tablet
(C) Smartphone
(D) Desktop

104. Which of the following words is most **dissimilar** to the others?

(A) Summer
(B) Autumn
(C) Winter
(D) Spring

105. What is the next number in the following sequence?

1, 1, 2, 3, 5, 8, ...

(A) 10
(B) 11
(C) 12
(D) 13

106. What is the missing number in the following sequence?

2, 4, 6, 8, ………., 12, 14, 16

(A) 7
(B) 9
(C) 10
(D) 11

107. What is the missing number in the following sequence?

7, 14, 28, 56, …….., 224

(A) 80
(B) 112
(C) 120
(D) 168

108. What is the next number in the following sequence?

1, 4, 9, 16, 25, ……….

(A) 36
(B) 49
(C) 64
(D) 81

109.   What is the missing number in the following sequence?

3, 5, 9, 17, ………., 65

(A) 27
(B) 33
(C) 33.5
(D) 33.75

110.   What is the next number in the following sequence?

2, 6, 18, 54, ………...

(A) 150
(B) 162
(C) 170
(D) 180

111.   What is the missing number in the following sequence?

4, 8, 16, 32, ………., 128

(A) 48
(B) 64
(C) 72
(D) 96

112.   If $A = \{1, 2, 3, 4, 5\}$ and $B = \{3, 4, 5, 6, 7\}$, what is $A \cap B$?

(A) $\{3, 4, 5\}$
(B) $\{1, 2, 3, 4, 5, 6, 7\}$
(C) $\{1, 2, 6, 7\}$
(D) $\{\}$

113.   If $A = \{a, b, c, d\}$ and $B = \{c, d, e, f\}$, what is $A \cap B$?

(A) $\{c, d\}$
(B) $\{a, b, c, d, e, f\}$
(C) $\{\}$
(D) $\{a, b, e, f\}$

114.   If $A = \{a, b, c, d\}$ and $B = \{c, d, e, f\}$, what is $B - A$?

(A) $\{e, f\}$
(B) $\{c, d, e, f\}$
(C) $\{a, b, c, d\}$
(D) $\{\}$

115. A bat and ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

    (A) $0.10
    (B) $0.05
    (C) $0.15
    (D) $0.20

116. If all socks are either black or white and 70% of socks are black, what is the minimum percentage of socks that must be chosen randomly to guarantee at least one pair of matching socks?

    (A) 50%
    (B) 60%
    (C) 70%
    (D) 71%

117. If $2x + 3 = 11$, what is the value of x?

    (A) 2
    (B) 4
    (C) 6
    (D) 8

118. A train travels 400 km in 5 hours. What is its average speed in kilometers per hour?

    (A) 80 km/h
    (B) 100 km/h
    (C) 120 km/h
    (D) 140 km/h

119. If a number is divisible by 3 and by 5, it is also divisible by

    (A) 2
    (B) 4
    (C) 6
    (D) 10

120. In a group of 30 people, 20 are men and 10 are women. What percentage of the group are women?

    (A) 10%
    (B) 20%
    (C) 30%
    (D) 40%

121. C# runs on the ………..

    (A) .NET Framework
    (B) Java Virtual Machine
    (C) Both .NET Framework and Java Virtual Machine
    (D) None of the above

122. HTML headings are defined with the ………….. tags

    (A) <head1> to <head6>
    (B) <p1> to <p6>
    (C) <h1> to <h6>
    (D) <h1> to <h3>

123. SQL ………….. can be used to delete or drop existing databases in a SQL schema

    (A) CREATE DATABASE
    (B) RENAME DATABASE
    (C) DROP DATABASE
    (D) SELECT DATABASE

124. What does AVG() function returns?

    (A) First value of the column
    (B) Last value of the column
    (C) Sum of rows of the table
    (D) Average value of the column

125. What is the output of the following code snippet?

```
#include <stdio.h>
int main() {
int a = 10, b = 5;
printf("%d", a+b);
return 0;
}
```

    (A) 10
    (B) 5
    (C) 15
    (D) Error

126. Which control structure is used to execute a block of code repeatedly until a certain condition is met?

   (A) if statement
   (B) for loop
   (C) switch statement
   (D) while loop

127. Which control structure is used to execute a block of code only if a certain condition is met?

   (A) if statement
   (B) for loop
   (C) switch statement
   (D) while loop

128. Which keyword is used to pass a parameter by reference in a function?

   (A) const
   (B) static
   (C) extern
   (D) pointer

129. Which function is used to write a string to standard output in C?

   (A) scanf
   (B) getchar
   (C) gets
   (D) puts

130. Which operator is used to get the memory address of a variable in C?

   (A) *
   (B) %
   (C) &
   (D) #

131. Which of the following expressions is equivalent to $p[2]$ where p is an array of integers?

   (A) $*(p + 2)$
   (B) $*(2 + p)$
   (C) $p - 2$
   (D) $p + 2$

132. Which of the following functions can be used to concatenate two strings in C?

    (A) strcat
    (B) strlen
    (C) strcmp
    (D) strchr

133. Which of the following functions can be used to copy one string to another in C?

    (A) strcpy
    (B) strlen
    (C) strcmp
    (D) strchr

134. Which keyword is used to define a structure in C?

    (A) class
    (B) typedef
    (C) struct
    (D) union

135. Which of the following operators is used to access a member of a structure in C?

    (A) .
    (B) ->
    (C) *
    (D) []

136. What is the output of the following code snippet?

```
#include <stdio.h>
int main() {
int a = 5, b = 10;
if (a > b) {
printf("a is greater than b");
} else {
printf("b is greater than a");
}
return 0;
}
```

    (A) a is greater than b
    (B) b is greater than a
    (C) 5
    (D) 10

137. What is the output of the following code snippet?

```
#include <stdio.h>
int main() {
int a = 10;
printf("%d", a++);
return 0;
}
```

(A) 10
(B) 11
(C) Error
(D) None of the above

138. What is the output of the following code snippet?

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

(A) 01234
(B) 12345
(C) 43210
(D) Error

139. Which of the following statements is true about the below C program?

```c
#include <stdio.h>
int main() {
int a = 10, b = 20, c = 30;
int result = 0;
if (a < b && a < c) {
result = a;
}
else if (b < a && b < c) {
result = b;
}
else {
result = c;
}
printf("The smallest number is %d", result);
return 0;
}
```

(A) The program outputs the largest number among the given integers
(B) The program outputs the smallest number among the given integers
(C) The program outputs an error due to missing semicolons
(D) The program outputs the sum of the given integers

140. What is the output of the following C code?

```c
#include <stdio.h>
int main() {
int x = 10;
while (x++ < 15) {
printf("%d", x);
}
return 0;
}
```

(A) 10 11 12 13 14
(B) 11 12 13 14 15
(C) 11 13 15
(D) 10 12 14

141. What is the output of the following C code?

```c
#include <stdio.h>
int main() {
int x = 5, y = 10;
int *p = &x, *q = &y;
*p = *q;
printf("%d %d", x, y);
return 0;
}
```

(A) 5 10
(B) 10 10
(C) 10 5
(D) The code contains an error

142. What is the output of the following C code?

```c
#include <stdio.h>
int main()
{
int i = 1, j = 2, k;
k = i + j * 3;
printf("%d", k);
return 0;
}
```

(A) 7
(B) 9
(C) 11
(D) 17

143. What will be the output of the following C code?

```c
#include <stdio.h>
int main()
{
int a = 5;
if (a > 3)
{
printf("Hello");
}
else
{
printf("World");
}
return 0;
}
```

(A) Hello
(B) World
(C) 5
(D) None of the above

144. What is the output of the following C code?

```c
#include <stdio.h>
int main()
{
int x = 10, y = 15, z;
z = x++ + --y;
printf("%d", z);
return 0;
}
```

(A) 23
(B) 24
(C) 25
(D) 26

145. What is the output of the following C code?

```
#include <stdio.h>
int main()
{
int i = 0, j = 1;
while (i < 5)
{
j += i;
i++;
}
printf("%d", j);
return 0;
}
```

(A) 6
(B) 10
(C) 15
(D) 16

146. What is the output of the following code snippet?

```
int main() {
int x = 10;
if (x == 5 || x == 10) {
printf("x is either 5 or 10");
}
else {
printf("x is neither 5 nor 10");
}
return 0;
}
```

(A) x is either 5 or 10
(B) x is neither 5 nor 10
(C) Compilation error
(D) Runtime error

147. What is the output of the following code snippet?

```
int main() {
int x = 5;
int y = 10;
int z = x + y;
printf("The sum of %d and %d is %d", x, y, z);
return 0;
}
```

(A) The sum of 5 and 10 is 15
(B) The sum of x and y is z
(C) The sum of %d and %d is % d
(D) Compilation error

148. What is the output of the following C program?

```
#include <stdio.h>
int main() {
int a = 5;
int b = 2;
float c = a / b;
printf("%f", c);
return 0;
}
```

(A) 2.000000
(B) 2.500000
(C) 2.000000e+00
(D) 2.500000e+00

149. What is the output of the following code snippet?

```
int main() {
int i;
for (i = 0; i < 5; i++) {
printf("%d ", i);
}
return 0;
}
```

(A) 0 1 2 3 4
(B) 1 2 3 4 5
(C) 0 1 2 3
(D) Compilation error

150. What is the output of the following C code?

```c
#include <stdio.h>
int main() {
int x = 5, y = 10, z;
z = x++ * --y;
printf("%d", z);
return 0;
}
```

(A) 45
(B) 40
(C) 50
(D) 55

FINAL ANSWER KEY

Subject Name: M VOC MOBILE PHONE APPLICATION DEVELOPMENT

SI No.	Key	SI No.	Key	SI No.	Key	SI No.	Key	SI No.	Key
1	D	31	B	61	A	91	D	121	A
2	B	32	B	62	B	92	D	122	C
3	D	33	C	63	D	93	D	123	C
4	C	34	B	64	B	94	B	124	D
5	D	35	A	65	C	95	C	125	C
6	C	36	A	66	B	96	D	126	D
7	C	37	B	67	D	97	C	127	A
8	C	38	C	68	C	98	C	128	D
9	C	39	C	69	A	99	C	129	D
10	D	40	A	70	C	100	B	130	C
11	A	41	D	71	B	101	D	131	A
12	B	42	B	72	B	102	B	132	A
13	C	43	B	73	C	103	D	133	A
14	D	44	C	74	A	104	A	134	C
15	B	45	C	75	D	105	D	135	A
16	D	46	C	76	D	106	B	136	B
17	B	47	D	77	A	107	D	137	A
18	B	48	A	78	D	108	B	138	A
19	D	49	A	79	B	109	B	139	B
20	A	50	A	80	D	110	B	140	B
21	B	51	C	81	D	111	B	141	B
22	D	52	C	82	D	112	A	142	C
23	B	53	B	83	B	113	A	143	A
24	D	54	D	84	B	114	A	144	B
25	C	55	C	85	D	115	A	145	C
26	B	56	C	86	A	116	D	146	A
27	D	57	B	87	D	117	B	147	A
28	C	58	A	88	A	118	A	148	A
29	D	59	A	89	D	119	D	149	A
30	D	60	A	90	D	120	B	150	A