

1. The value of the integral $\int x \cos x dx$ is
 (A) $x \cos x + \sin x + c$ (B) $x \sin x + \cos x + c$
 (C) $\frac{1}{2} x^2 \cos x + c$ (D) $x \sin x - \cos x + c$
2. Value of the integral $\int_0^\pi |\cos x| dx$ is
 (A) 0 (B) 1 (C) 2 (D) None of these
3. The value of $\int_{-2}^2 [x] dx$ ($[x] \leq x$ denotes the greatest integer value)
 (A) 0 (B) 1 (C) -1 (D) None of these
4. The area bounded by the curve $x = 2 - y - y^2$ and y -axis is
 (A) $\frac{9}{2}$ (B) $\frac{7}{2}$ (C) $\frac{5}{2}$ (D) None of these
5. $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cos x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$ is equal to
 (A) 0 (B) 1 (C) $\frac{\pi}{2}$ (D) $\frac{\pi}{4}$
6. The value of the integral $\int_0^{\frac{\pi}{2}} x \cos x dx$ is equal to
 (A) 1 (B) $\frac{\pi}{2} - 1$ (C) 0 (D) None of these
7. The domain of the function $f(x) = \sin^{-1}\left(\frac{x-3}{2}\right) - \ln(4-x)$ is
 (A) (1,4) (B) [1,4) (C) (1,4] (D) None of these
8. $\lim_{x \rightarrow 0} \frac{\tan x - \sin x}{x^3}$ is equal to
 (A) 1 (B) -1 (C) $\frac{1}{2}$ (D) None of these
9. The points of discontinuity of the function $f(x) = |\cos x|$ is

(A) $\{n\pi : n \in \mathbb{Z}\}$

(B) $\left\{ (2n+1)\frac{\pi}{2}, n \in \mathbb{Z} \right\}$

(C) empty set

(D) None of these

10. Let $f(x) = \begin{cases} x^2 & \text{if } x \leq -2 \\ ax+b & \text{if } x > -2 \end{cases}$

Then the coefficients a and b at which the function is continuous and has a derivative at $x = -2$ is

(A) $a = -4, b = -4$

(B) $a = 4, b = -2$

(C) $a = -4, b = 2$

(D) None of these

11. If $y = \begin{cases} 2x^2 \sin\left(\frac{1}{x}\right) & x \neq 0 \\ 0 & x = 0 \end{cases}$. Then the value of $y''(0)$

(A) 1

(B) -1

(C) 0

(D) does not exist

12. If $e^x \sin y - e^y \cos x = 0$, then the value of $y' \Big|_{(0,0)}$ is

(A) 1

(B) 0

(C) 2

(D) None of these

13. The maximum value of the function $f(x) = 2x^3 - 15x^2 - 84x + 8$ occurs at

(A) $x = 2$

(B) $x = -2$

(C) $x = 7$

(D) None of these

14. The equation of normal to the curve $x^5 + y^5 - 2xy = 0$ at the point $(1,1)$ is

(A) $x + y - 2 = 0$

(C) $y = x$

(B) $2x + y - 3 = 0$

(D) None of these

15. If $f(x, y) = 2x^2 + \sin xy - \cos y$, then $f_y \left(1, \frac{\pi}{2} \right)$ is

(A) 0

(B) 2

(C) 3

(D) None of these

16. General solution of the differential equation $\frac{d^2 y}{dx^2} = \cos 3x$ is

(A) $-\frac{1}{9}\cos 3x + c_1x + c_2$ (B) $\frac{1}{9}\cos 3x + c_1x + c_2$

(C) $\frac{1}{9}\sin 3x + c_1x + c_2$ (D) None of these

17. The order and degree of the differential equation $\left(\frac{dy}{dx} + y\right)^{\frac{1}{3}} = \sin x$ is

(A) 1,2 (B) 1,1 (C) 1,3 (D) None of these

18. If $|3\hat{i} + 4\hat{j} + a\hat{k}| = 5$, then value of a is

(A) 1 (B) -1 (C) 0 (D) None of these

19. If $|\vec{a}| = 3, |\vec{b}| = 2, |\vec{c}| = 1$ and $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ then $\vec{a} \cdot \vec{b} + \vec{b} \cdot \vec{c} + \vec{c} \cdot \vec{a}$ is equal to

(A) 6 (B) -6 (C) 7 (D) -7

20. The area of the parallelogram of which \hat{j} and $\hat{j} + \hat{k}$ are adjacent sides is

(A) 2 (B) $\frac{1}{2}$ (C) 1 (D) $\sqrt{2}$

21. The angle between the two lines whose direction of ratios (d.r) are

$4, \sqrt{3} - 1, -\sqrt{3} - 1$ and $4, -\sqrt{3} - 1, \sqrt{3} - 1$ respectively is

(A) 60° (B) 45° (C) 90° (D) None of these

22. The equation of the sphere through $(1,0,0), (0,1,0), (0,0,1)$ with its centre on the plane $3x - y + z = 0$ is

(A) $(x^2 + y^2 + z^2) - 4x - 4y - 4z + 1 = 0$

(B) $(x^2 + y^2 + z^2) - 4x + 4y - 4z + 1 = 0$

(C) $(x^2 + y^2 + z^2) - 4x - 4y + 4z + 1 = 0$

(D) None of these

23. The plane $5y + 3 = 0$ is parallel to

(A) xz -plane (B) x -axis (C) y -axis (D) None of these

24. The image of the point $(6, 2)$ on the line $y = x - 2$ is
 (A) $(2, 2)$ (B) $(3, 3)$ (C) $(4, 4)$ (D) None of these
25. Find the angle between the pairs of line $8x^2 + 9xy - 8y^2 = 0$ is
 (A) $\frac{\pi}{4}$ (B) $\frac{\pi}{2}$ (C) $\frac{\pi}{3}$ (D) None of these
26. If the centre of the circle is on $x = y$ and it passes through $(2, -1)$ and $(4, 2)$, then the equation of the circle is
 (A) $x^2 + y^2 + 3x - 3y - 2 = 0$ (B) $x^2 + y^2 - 3x - 3y - 2 = 0$
 (C) $x^2 + y^2 + 3x + 3y - 2 = 0$ (D) None of these
27. If the given parabola has its vertex at $(0, 0)$ and focus at $(-2, 0)$, then its equation is
 (A) $y^2 = -8x$ (B) $y^2 = 8x$ (C) $x^2 = 8y$ (D) None of these
28. The length of the latus rectum of the hyperbola $49y^2 - 16x^2 = 784$ is
 (A) 49 (B) 16 (C) $\frac{49}{2}$ (D) None of these
29. The value of c^2 for which the line $y = x + c$ is a tangent to the ellipse $3x^2 + 4y^2 = 1$ is
 (A) $\frac{7}{4}$ (B) $\frac{7}{3}$ (C) $\frac{7}{12}$ (D) None of these
30. The decimal equivalent of binary number $(11011001)_2$ is
 (A) 216 (B) 215 (C) 214 (D) 217
31. If X is a square matrix such that $X^2 = X$, then $(I + X)^3 - 7X$ is equal to
 (A) X (B) $I - X$
 (C) I (D) $3X$

32. The value of determinant: $\begin{vmatrix} 4 & 5 & 6 \\ 1 & 2 & 3 \\ 0 & -1 & 1 \end{vmatrix}$ is
- (A) 9 (B) -9 (C) 0 (D) None of these

33. The value of α and β for which the system of equations

$$x + 4y + \alpha z = \beta$$

$$x + 4y + 3z = 10$$

$$x + 2y + z = 6$$

has a unique solution is

- (A) $\alpha \neq 3, \beta \in \mathbb{R}$ (B) $\alpha = 3, \beta \neq -10$
 (C) $\alpha = 3, \beta = 10$ (D) None of these

34. The cofactor of 18 in the determinant

$$\begin{vmatrix} 4 & 14 & -10 \\ 1 & 2 & 6 \\ 7 & 18 & 3 \end{vmatrix}$$

- (A) 34 (B) 14 (C) -10 (D) -34

35. The variance of the following data 6,7,10,12,13,4,8,12 is

- (A) 9 (B) 8 (C) 8.5 (D) None of these

36. The solution of the differential equation $\ln\left(\frac{dy}{dx}\right) = 4x + 3y$ when $y(0) = 0$ is

- (A) $3e^{4x} + 4e^{-3y} = 7$ (B) $3e^{4x} + 4e^{3y} = 4$
 (C) $4e^{4x} - 3e^{-3y} = 3$ (D) $3e^{4x} - 4e^{-3y} = 7$

37. The solution of the differential equation $\frac{dy}{dx} - e^x = 0$, when $y(0) = 2$ is given by

(A) $y = e^x + 2$ (B) $y = e^{-x} + 2$ (C) $y = e^x + 1$ (D) None of these

38. 5 mathematics and 3 physics books are kept at random in a shelf. Then the probability that 2 particular mathematics book will be together is

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{8}$ (D) None of these

39. A determinant is chosen at random from the set of all determinants of order 2 with elements 0 and 1 only. The probability that the values of the determinant chosen is not positive is

(A) $\frac{3}{16}$ (B) $\frac{13}{16}$ (C) $\frac{5}{16}$ (D) None of these

40. The number of other ways rectangle PQRS is named is

(A) 20 (B) 24 (C) 23 (D) None of these

41. The number of diagonal of polygon of side 9

(A) 27 (B) 54 (C) 18 (D) None of these

42. If $\tan \alpha = \frac{5}{6}$ and $\tan \beta = \frac{1}{11}$, then

(A) $\alpha + \beta = \frac{\pi}{6}$ (B) $\alpha + \beta = \frac{\pi}{4}$ (C) $\alpha + \beta = \frac{\pi}{3}$ (D) None of these

43. In a triangle, the lengths of the two larger sides are 10 and 9 respectively. If the angles are in A.P., then a possible third side is

(A) $7 + \sqrt{6}$ (B) $3\sqrt{3}$ (C) 5 (D) $5 + \sqrt{6}$

44. The value of $\sin \cos^{-1} \tan \sec^{-1} \sqrt{2}$ is

(A) 1 (B) $\frac{1}{2}$ (C) 0 (D) None of these

45. The number of solution of the equation $\sqrt{3} \cos x + \sin x = 1$, $x \in [0, 2\pi]$ is

- (A) 3 (B) 4 (C) 2 (D) None of these

46. $\sin 47^\circ + \sin 61^\circ - \sin 11^\circ - \sin 25^\circ$ is equal to

- (A) $\sin 36^\circ$ (B) $\cos 36^\circ$ (C) $\sin 7^\circ$ (D) $\cos 7^\circ$

47. The truth value F(False) of the following is

- (A) $6 + 9 = 13$
(B) $16 > -17$
(C) Bhubaneswar is capital of Odisha
(D) All men are mortal

48. Which of the following is true?

- (A) $\sim p$ and $\sim(\sim p)$ have same truth value
(B) $p \wedge q$ is true only when both p and q are true
(C) $\neg p \Rightarrow \neg q$ is the contra positive statement of $p \Rightarrow q$
(D) None of these

49. The number of non-empty subsets of $\{\phi, \{\phi\}\}$ is

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

50. $(X \setminus Y) \cap Y$ is equal to

- (A) X (B) Y (C) $X \cup Y$ (D) ϕ

51. The relation $R = \{(a, a), (a, b), (b, a)\}$ on $\{a, b, c\}$

- (A) is symmetric and transitive but not reflexive
(B) is reflexive and symmetric but not transitive
(C) is reflexive and transitive but not symmetric
(D) None of these

52. The function $f : \mathbb{R} \rightarrow [-1,1]$ given by $f(x) = \sin x$ is
(A) one-to-one (B) onto (C) bijective (D) None of these

53. The inverse of $f(x) = 2^x$ is given
(A) $\log_{10} x$ (B) $\log_2 x$ (C) $\ln x$ (D) None of these

54. If $f : \mathbb{R} \rightarrow \mathbb{R}$ be a function which is both odd and even then
(A) $f(x) = 0$ (B) $f(x) = 3x$ (C) $f(x) = -3x$ (D) None of these

55. If x, y and z are positive unequal numbers and $x+y+z=1$, then which of the following is true

(A) $(1-x)(y-1)(z-1) > 8xyz$ (B) $(1-x)(1-y)(1-z) < 8xyz$
(C) $(1-x)(1-y)(1-z) < 4xyz$ (D) None of these

56. If $a + b\omega + c\omega^2 = 0$ and $a, b, c \in \mathbb{R}$ and ω is complex cube root of 1 then which of the following is true

(A) $a = 1, b = 1, c = 2$ (B) $a = 2, b = 2, c = 1$
(C) $a = 4, b = -2, c = 1$ (D) $a = -2, b = -2, c = -2$

57. If ω is a complex cube root of 1, then $1 + |\omega| + |\omega^2|$ is

(A) 0 (B) 4 (C) 2 (D) None of these

58. If $a = \cos \alpha + i \sin \beta, b = \cos \beta + i \sin \beta, c = \cos \gamma + i \sin \gamma$ and $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} = 1$ then

$\sin(\alpha - \beta) + \sin(\beta - \gamma) + \sin(\gamma - \alpha)$ is equal to

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

59. The term independent of x in $\left(3x^2 - \frac{1}{3x}\right)^6$ is

(A) $\frac{15}{9}$ (B) $\frac{13}{9}$ (C) $\frac{16}{9}$ (D) $\frac{17}{9}$

60. If $(1+x)^n = C_0 + C_1x + C_2x^2 + \dots + C_nx^n$, then $C_0 + \frac{C_1}{2} + \frac{C_2}{3} + \dots + \frac{C_{49}}{50}$ is
- (A) $\frac{2^{49}}{50}$ (B) $\frac{2^{50}}{50}$ (C) $\frac{2^{49}}{49}$ (D) None of these

61. When a computer is switched off, which one of the following storage devices will lose all the information it contains?
- a) ROM
 - b) RAM
 - c) Flash
 - d) EEPROM
62. Which one of the following sentences concerning DRAM is TRUE?
- a) DRAM is used as the cache memory in processors
 - b) It is more expensive than SRAM
 - c) Pen drive storage is made from DRAM
 - d) Main memory of a computer is made from DRAM
63. Cache memory enhances which one of the following characteristics of a memory system?
- a) Memory capacity
 - b) Memory access time
 - c) Secondary storage capacity
 - d) Secondary storage bandwidth
64. Which one of the following is FALSE regarding a recursive function?
- a) A recursive function can always be rewritten using a loop
 - b) A recursive function always executes faster than its loop equivalent
 - c) A recursive function is a function that calls itself
 - d) Recursion can sometimes yield a natural and simple solution to a problem that would otherwise be very difficult to program.

65. How many times is the symbol '#' printed by the function call `foo(4)`?

```
void foo (int i) {  
    if (i > 1) {  
        foo (i/2);  
        foo (i/2); }  
    cout << "#"; }  
}
```

- a) 3
- b) 4
- c) 7
- d) 8

66. Which one of the following sentences most closely conveys the meaning of the term “resolution of a display screen”?

- a) The number of dots that a screen can display
- b) A measure of the speed with which a screen can refresh an image when it is changed
- c) The diameter of the screen
- d) The number of colours that the screen can display

67. Which one of the following is NOT an output device?

- a) Plotter
- b) Scanner
- c) Speech synthesizer
- d) Projector

68. Which one of the following is the most appropriate reason for use of data compression?

- a) Encrypts a file for security
- b) Makes it easier to process the file by a digital computer
- c) Reduces the size of a file by deleting unwanted contents
- d) Reduces the size of a file to help in storage or transmission

69. How many address lines are needed to address each memory location in a 2048 x 8 memory chip?

- a) 10
- b) 11
- c) 8
- d) 12

70. Which one of the following is an important advantage of using functions in development of large programs?

- a) These increase the execution speed of a program
- b) These make the program development easier by helping to eliminate repetitive code
- c) A program cannot compile if it is not made up into functions
- d) The compiler automatically switches to a more powerful function mode when compiling a program with functions

71. What would be displayed when the following code segment gets executed?

```
int i=1, j=3, k=4;  
printf("%i", j-j*5/k%2);
```

- a) 0
- b) 1
- c) -1

d) 3

72. Consider the following C program segment. What would get displayed when the program segment gets executed?

```
char x = 'w';
switch(x){
    case 'w': printf("Write");
    case 'r': printf("Read");
                break;
    case 'a': printf("Append");
                break;
    default : printf("Open");
                break;
}
```

- a) WriteRead b) Read c) WriteOpen d) Open

73. Consider the following function `test`. Determine the value that would be returned when it is called as `test(27)`.

```
int test(int x){
    if (x%2 == 0) return x;
    else return 0;
}
```

- a) 0 b) 1 c) 2 d) 27

74. What does the following function compute?

```
int funct(int x, int y){
    int t;
    while (y){
        t = x;
        x = y;
        y = t % y;
    }
    return x;
}
```

- a) Returns y after swapping the values of x and y.
b) Returns the greatest common divisor of x and y.
c) Returns the least common multiplier of x and y.
d) Calculates and returns the multiplied value of x with y.

75. What does the 'sum' variable of the following program segment compute for any value of N?

```
int i, sum=0;
for(i=1;i<N;i*=2) {
    sum +=i;
}
```

- a) Sum of a geometric progression with a common ratio of 2 and the initial value of 1.
b) Sum of a geometric progression with a common ratio of 1 and the initial value of 2.
c) Sum of a sequence with numbers that are multiples of 2.
d) Sum of an arithmetic progression with common difference 2 and with initial term 1.

76. What would displayed when the following program segment gets executed?

```
int answer = 1/3;
printf("%.2f\n", answer);
```

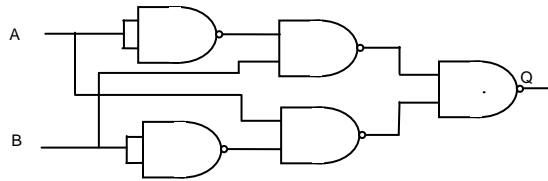
- a) 0.33 b) 1 c) 0.00 d) 0

77. Suppose the following program segment is executed. What would get displayed if the user types 2, then hits return?

```
int k;
k = getchar ( );
printf ("%d", k);
```

- a) 2
b) Decimal value of character 2
c) The character string "2"
d) Run time error message

78. Which Boolean function does the following logic circuit compute?



- a) EXOR
b) Flip Flop
c) Counter
d) Multiplexer

79. Which of the following is an incorrect Internet Protocol (IP V4) number?

- a) 143.239.1.1
b) 14.23.9.1
c) 143.2.999.1
d) 144.1.99.209

80. Which one of the following protocols is used for securely sending data on the internet?

- a) SMTP
b) HTTP
c) HTTPS
d) HDLC

81. Consider the following statement: "He stressed on the need to stop the present examination system and replace it by other methods which would measure the real merit of the students."

Which of the following two conclusions can be drawn from the given statement?

- I. Examinations should be abolished.
II. The present examination system does not measure the real merit of the students.
- a) Only conclusion I
b) Only conclusion II
c) Neither I nor II
d) Both I and II

82. Consider the following statement: "The percentage of the national income shared by the top 10 per cent of households in India is 35." Which of the following two conclusions can be drawn from the given statement?

- I. When an economy grows fast, concentration of wealth in certain pockets of population takes place.
II. The national income is unevenly distributed in India.
- a) Only conclusion I
b) Only conclusion II
c) Neither I nor II
d) Both I and II

83. Which one of the following is the missing term in the series: 5, 8, 12, 17, 23, _____, 38, ...
- a) 26
 - b) 28
 - c) 29
 - d) 30
84. Which one of the following pair of words expresses the relationship that is most similar to that of the following capitalized pair of words: **SCISSORS:CLOTH**
- a) Axe:Wood
 - b) Stone : Grinder
 - c) Knife: Stone
 - d) Gun: Hunter
85. Which one of the following pairs of words that expresses the relationship that is most similar to that of the capitalized pair of words: **WRITER : PEN**
- a) pencil : eraser
 - b) ball pen : notebook
 - c) typewriter : paper
 - d) blacksmith : hammer
86. Consider the following sentence that has one word missing: **Tweezers are used for _____**
Which one of the following words can be used to most appropriately complete the sentence?
- a) Plucking
 - b) clipping
 - c) measuring
 - d) chopping
87. Which one of the following words is closest to the meaning of the word: **Ingenious**
- a) Imaginative
 - b) Colourful
 - c) Dull
 - d) Wickedness
88. Which one of the following words is closest to the meaning of the word: **conflagration**
- a) Popularity
 - b) Authentic
 - c) Great man
 - d) Great fire
89. What is the length of IPv6 addresses?
- a) 8 bytes
 - b) 16 bytes
 - c) 32 bytes
 - d) 128 bytes
90. Which one of the following is a correct statement in the context of the address of a variable in C?
- a) Address is the numerical value of the physical memory location at which the variable is stored
 - b) Two variables can have the same address
 - c) Address of a variable cannot change during a program's execution
 - d) Value of an integer variable can be an address
91. Which one of the following programming languages can be used to write machine independent programs?
- a) High level language

- b) Low level language
 - c) Assembly language
 - d) Machine language
92. The machine cycle of a processor refers to which one of the following?
- a) Fetching an instruction
 - b) Fetching, decoding and executing an instruction
 - c) Executing an instruction
 - d) Clock speed
93. Which one among the following storage devices has the fastest access time?
- a) Cache
 - b) Main Memory
 - c) Hard drive
 - d) Registers
94. Which one of the following sentences would be TRUE after the following C++ instruction executed?
- ```
delete newPtr;
```
- a) The memory referenced by newPtr is released only if it is needed by the system.
  - b) The pointer newPtr is of type void \*.
  - c) The pointer newPtr exists only if there was an error in freeing the memory.
  - d) The pointer newPtr still exists.
95. Which one of the following statements about stacks is incorrect?
- a) Stacks can be implemented using linked lists.
  - b) Stacks are first-in, first-out (FIFO) data structures.
  - c) New element can only be added to the top of the stack.
  - d) The bottom most element is popped out first.
96. Which one of the following statements characterizes an important difference between vectors and arrays in C++?
- a) Access to any element using the[]operator.
  - b) Stored in contiguous blocks of memory.
  - c) The ability to change size dynamically.
  - d) Efficient direct access to any element.
97. Which one of the following is an important activity carried out by a virtual memory operating system?
- a) Delete unwanted data from RAM
  - b) Copy unwanted data from RAM to disk
  - c) Move less used data from RAM to disk
  - d) Stop programs when the computer runs out of main memory
98. Which one of the following numbers is equivalent to the binary number 100110?
- a) Decimal number 46
  - b) Octal number 46
  - c) Hexadecimal number 46
  - d) Base-7 number 26
99. Which one of the following base-5 numbers is equivalent to the decimal number 888?
- a) 444

- b) 12023
- c) 131313
- d) 12021

100. What is the time complexity of the following code segment?

```
for(int i=0; i<10; i++)
 for(int j=0; j<N; j++)
 for(int k=N-2; k<N+2; k++)
 cout << i << " " << j << endl;
```

- a)  $O(\log N)$
- b)  $O(N \log N)$
- c)  $O(N)$
- d)  $O(N^2)$

101. Consider the following constraint on the execution of a process: "Only one process may use a resource at a time." Which one of the following terms best characterizes this constraint?

- a) Mutual Exclusion
- b) Hold and wait
- c) No preemption
- d) Circular wait

102. Which one of the following types of flip-flops is used as a latch?

- a) JK flip-flop
- b) D flip-flop
- c) RS flip-flop
- d) T flip-flop

103. What is the purpose of the preamble bits in an Ethernet frame?

- a) Initialization of ARP
- b) Pre-bit counting
- c) Synchronization
- d) Error checking

104. In the ISO/OSI protocol suite, routing of packets is the responsibility of which one of the following layers?

- a) Application layer
- b) Data-link layer
- c) Transport layer
- d) Network layer

105. Which one of the following algorithms is used to handle collisions in Ethernet networks?

- a) Collision Pooling
- b) Time Division Multiplexing (TDM)
- c) Exponential-backoff
- d) Carrier sense multiplex

106. Which one of the following methods of implementing a priority queue would have the best performance when insertion and deletion need to be fast?

- a) Ordered array
- b) Ordered linked list
- c) Heap
- d) Binary search tree

107. Which one of the following statements concerning heaps is NOT true?

- a) A heap is usually stored in a binary search tree (BST).
- b) A heap can be stored in an array.

- c) A heap can be used to implement a priority queue.
  - d) A heap can be used to sort data.
108. Which one of the following Hexadecimal numbers is equivalent to the Octal number 72.72?
- a) 5A.E1
  - b) 5E.58
  - c) 3A.E8
  - d) 3B.7A
109. Which one of the following components of a computer determines its MAC address?
- a) Hub.
  - b) Access Router.
  - c) Graphic Accelerator Card.
  - d) Network Interface Card.
110. In a C++ method call, an object parameter is passed by which one of the following parameter passing mechanisms?
- a) Value
  - b) Reference
  - c) Value-Reference
  - d) Global
111. Which one of the following methods of communication represents the transmission taking place in both directions, however, only in one direction?
- a) Simplex
  - b) Bi-duplex
  - c) Full duplex
  - d) Half duplex



112. Which one of the following statements regarding C++ programs is TRUE?
- Private members of a base class cannot be accessed by derived class member functions.
  - In a class, several different methods in the class may implement the same operation.
  - Multiple inheritance is the feature by which multiple subclasses inherit features of one base class.
  - Protected attributes can be directly be accessed by class methods of a derived class.
113. Which one of the following most accurately characterizes a stream in C++?
- The flow of control among the methods
  - The flow of data from one place to another
  - A file
  - A device interface
114. Which one of the following is TRUE of a C++ class hierarchy?
- Describes “is made up of” relationships
  - Describes “has a” relationships
  - Describes “is kind of” relationships
  - Describes “manages” relationships
115. Which one of the following addressing modes is used in an instruction of the form ADD X,Y?
- Immediate
  - Indirect
  - Index
  - Absolute
116. During an FTP session, how many times is the control connection opened?
- Exactly once.
  - Exactly twice.
  - As many times as required
  - Control connection is never opened.
117. Which one of the following protocols is used by a browser to request a web page in the WWW?
- SNMP
  - SMTP
  - HTTP
  - POP3
118. An e-mail can contain multimedia contents in which one of the following formats?
- BISYNC
  - SDLC
  - HDLC
  - MIME
119. Which one of the following is a characteristic of the http protocol?
- Stateless
  - State-based
  - Stateful
  - State-aware
120. Which of the following is an important function of a web browser?
- Compile CGI programs
  - Interpret CGI programs
  - Compile HTML documents
  - Interpret HTML documents