JNU MCA - 2005

1. If $\int_{\pi/2}^{0} \sin x dx = \sin 2\theta$, then the value of θ satisfying $0 < \theta < \pi$ is

(a) $3\pi/2$ (b) $\pi/6$ (c) $5\pi/6$ (d) $\pi/2$

2. Which one of the following operators cannot be overloaded ?

(a) Subscripting operator (b) Function call operator

(c) Membership operator (d) Assignment operator

3. A survey shows that 63% of Indians like banana whereas 76% like apples. if x% of Indians like both banana and apples, then

(a) $x = 39$ (b) $x = 63$ (c) $39 \leq x \leq 63$ (d) None of these

4. If $f(x) = ax + b$ and $g(x) = cx + d$, then $f(g(x)) = g(f(x))$ is equivalent to

(a) $f(a) = g(c)$ (b) $f(b) = g(b)$ (c) $f(a) = g(b)$ (d) $f(c) = g(a)$

5. Total number of commutative binary operation on a finite set containing n elements is

(a) $n\frac{n(n+1)}{2}$ (b) $n\frac{n(n-1)}{2}$ (c) n^{n^2} (d) 2^{n^2}

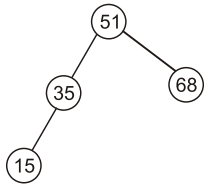
6. Which of the following is correct ?

(a) $1 + i > 2 - i$ (b) $2 + i > 1 + i$ (c) $2 - i > 1 + i$ (d) None of these

7. The encoding scheme that uses only both polarities to represent binary 1 and 0 is

(a) bi-phase (b) bipolar (c) polar (d) unipolar

8. Which of the following insertions in the AVL tree below will result in a non-AVL tree ?



(a) 15 (b) 37 (c) 70 (d) None of these

9. If the complex numbers $\sin x + i\cos 2x$ and $\cos x - i \sin 2x$ are conjugate to each other, then x is equal to

(a) $n\pi$ (b) $(n + 1/2)\pi$ (c) 0 (d) None of these

10. If $A1$, $A2$ be two AMs and $G1$, $G2$ be two GMs between a and b then $\frac{A1 + A2}{G1G2}$ is equal to

(a) $\frac{a+b}{2ab}$ (b) $\frac{2ab}{a+b}$ (c) $\frac{a+b}{ab}$ (d) $\frac{a+b}{\sqrt{ab}}$

11. Which of the following process models will be used to develop a software product for which critical requirements are poorly understood ?

(a) Waterfall (b) Throw-away Prototyping

(c) Evolutionary Prototyping (d) Incremental

12. The coefficient of x^{99} in the expansion of $(x-1)(x-2)\ldots(x-100)$ is equal to

(a) 5050 (b) 5000 (c) –5050 (d) –5000

13. The determinant $\begin{vmatrix} a & b & a\alpha + b \\ b & c & b\alpha + c \\ a\alpha + b & b\alpha + c & 0 \end{vmatrix}$ is equal to zero, if

(a) a, b, c are in AP (b) a, b, c are in GP (c) a, b, c are in HP (d) no relation between a, b, c

14. If sets A and B are defined as

(1) $A = \{(x, y) : y = e^x, x \in R\}$ (2) $B = \{(x, y) : y = x, x \in R\}$ then

(a) $B \subset A$ (b) $A \subset B$ (c) $A \cap B = \phi$ (d) $A \cup B = A$

15. In LRU page replacement algorithm, the pages to be replaced are taken from

(a) the past knowledge (b) the future knowledge

(c) the present knowledge (d) Depends on the page size of the processes.

16. The number of solutions of the equation $5^x - 5^{-x} = \log_{10} 25$, $(x \in R)$ is

(a) 0 (b) 1 (c) 2 (d) infinitely many

17. If n is even and ${}^nC_0 < {}^nC_1 < {}^nC_2 < \ldots < {}^nC_r > {}^nC_{r+1} > {}^nC_{r+2} > \ldots > {}^nC_n$, then r is equal to

(a) $\frac{n}{2}$ (b) $\frac{n-1}{2}$ (c) $\frac{n-2}{2}$ (d) $\frac{n+2}{2}$

18. A system multiplexes 10 channels of capacity 128 kbps each into a channe of 1024 kbps capacity using synchronous. Time Division Multiplexing. The number of channels, system will be able to multiplex if it uses asynchronous time division multiplexing, is

(a) 18 (b) 10 (c) 15 (d) 22

19. The number of times the digit 3 will be written when listing the integers from 1 to 1000 is

(a) 269 (b) 300 (c) 271 (d) 302

20. On your way to work, you have to drive through a busy junction where you may be stopped at traffic lights. The cycle of traffic light is 2 minutes of green followed by 3 minutes of red What is the expected delay in the journey, if you arrive at the junction at a random time uniformly distributed over the whole 5 minute cycle is ?

(a) $\frac{9}{10}$ minute (b) $\frac{3}{5}$ minute (c) $\frac{4}{5}$ minute (d) $\frac{3}{2}$ minute

21. The coefficient of x^5 in the expansion of $(1+x)^{21} + (1+x)^{22} + \ldots + (1+x)^{30}$

(a) ${}^{51}C_5$ (b) ${}^{9}C_5$ (c) ${}^{31}C_6 - {}^{21}C_6$ (d) ${}^{30}C_5 + {}^{20}C6$

22. What is the checksum code for a block of 5 messages defined by codes 48H, 65H, 60H, 70H and 21H ?

(a) 276H (b) 1AOH (c) AAH (d) AIH

23. The sum of the series $1 + \frac{1^2 + 2^2}{2!} + \frac{1^2 + 2^2 + 3^2}{3!} + \frac{1^2 + 2^2 + 3^2 + 4^2}{4!}$ is

(a) $3e$ (b) $\frac{17}{6}e$ (c) $\frac{13}{6}e$ (d) $\frac{19}{6}e$

24. Let X nave the poission distribution with parameter λ, such that $P(X = k+1) = r(k)\, P(X = K)$. Then $r(K)$ is

(a) $\frac{\lambda}{K+1}$ (b) $\frac{\lambda}{K}$ (c) $K\lambda$ (d) $\frac{K\lambda}{K+1}$

25. Consider a relation $R(P, Q, R, S)$ with the set of functional dependencies $F = \{PQ \to R,\ R \to S,\ S \to P\}$. Which of the following is a key of R

(a) PQ (b) QR (c) QS (d) All of these above

26. The number of ways in which n distinct objects can be put in two different boxes so that no box remains empty is

(a) $2^n - 1$ (b) $n^2 - 1$ (c) $2^n - 2$ (d) $n^2 - 2$

27. $\sum_{n-0}^{\infty} \frac{(\log_e x)^n}{n!}$ is equal to

(a) $\log e^x$ (b) x (c) $\log_x e$ (d) None of these

28. What will be the output of the following *C* Program ?

```
main ( )
{ int i, n = 5;
for (i = 1, i < = n; i ++)
print f ("%d", funct1 (i));
}
int funct1 (int n)
{ if n > 0
return (n + funct1 (n – 1));
else return (0);
}
```

(a) 1 3 6 10 15 (b) 3 6 10 15 21 (c) 1 3 7 9 15 (d) None of these

29. The resultant of three equal like-parallel forces acting at the vertices of a triangle acts at its

(a) incentre (b) circumcentre (c) orthocentre (d) centroid

30. If $I_1 = \int_e^{e^2} \frac{dx}{\log x}$ and $I_2 = \int_1^2 \frac{e^x dx}{x}$, then

(a) $I_1 = I_2$ (b) $2I_1 = I_2$ (c) $I_1 2I_2$ (d) None of these

31. The coefficient of x^n in the expansion of $\log_a(1 + x)$ is

(a) $\frac{(-1)^{n-1}}{n}$ (b) $\frac{(-1)^{n-1}}{n} \log_a e$ (c) $\frac{(-1)^{n-1}}{n} \log_e a$ (d) $\frac{(-1)^n}{n} \log_a e$

32. What is a system call ?

(a) Interface between process and hardware (b) Interface between OS and hardware

(c) Interface between process and OS (d) None ofthese

33. The inverse of a diagonal matrix is

(a) a symmetric matrix (b) a skew-symmetric matrix

(c) a diagonal matrix (d) None of these

34. The vector interrupt address of “TRAP” in 8085 microprocessor is

(a) 0034H (b) 003CH (c) 002CH (d) 0024H

35. The rank of a null matrix

(a) is 0 (b) is 1 (c) does not exist (d) None of these

36. If every pair from among the equations $x^2 + px + qr = 0$, $x^2 + qx + rp = 0$ has a common root, then the sum of the three common root is

(a) $2(p + q + r)$ (b) $p + q + r$ (c) $-(p + q + r)$ (d) pqr

37. If $\begin{vmatrix} p & q-y & r-z \\ p-x & q & r-z \\ p-x & q-y & r \end{vmatrix} = 0$, then the value of $\frac{p}{x} + \frac{q}{y} + \frac{r}{z}$ is

(a) 0 (b) 1 (c) 2 (d) 4 pqr

38. In a complete binary search tree with 7 nodes, maximum number of searches required to search an element is

(a) 7 (b) 4 (c) 3 (d) None of these

39. If A and B are two fixed points, then the locus of a point which moves in such a way that the angle APB is a right angle is

(a) a circle (b) an ellipse (c) a parabola (d) None of these

40. There are two bags each containing n balls. A boy has to select an equal number of balls from both the bags. The number of ways in which boy can choose at east one ball from each bag is

(a) ${}^{2n}C_n$ (b) $({}^{n}C_n)^2$ (c) ${}^{2n}C_1$ (d) ${}^{2n}C_n - 1$

41. Unsafe state is a deadlock state

(a) True (b) False (c) May be (d) Cannot be

42. The mid-points of the sides of a triangle are (5, 0), (5, 12) and (0, 12). The orthocentre of this triangle is

(a) (0, 0) (b) (10, 0) (c) (0, 24) (d) (13/3, 8)

44. If a line is drawn through a fixed point $P(\alpha, \beta)$ to cut the circle $x^2 + y^2 = a^2$ at A and B, then $PA \times PB$ is equal to

(a) $\alpha^2 + \beta^2$ (b) $\alpha^2 + \beta^2 - a^2$ (c) α^2 (d) $\alpha^2 + \beta^2 + a^2$

45. Points $A(1, 3)$ and $C(5, 1)$ are opposite vertices of a rectangle ABCD. If the slope of BD is 2, then its equation is

(a) $2x - y = 4$ (b) $2x + y = 4$ (c) $2x + y - 7 = 0$ (d) $2x + y + 7 = 0$

46. If the lines $ax + 2y + 1 = 0$, $bx + 3y + 1 = 0$, $cx + 4y + 1 = 0$ are concurrent, then a, b, c are in

(a) AP (b) GP (c) HP (d) None of these

47. The distance between the lines $4x + 3y = 11$ and $8x + 6y = 15$ is

(a) 7/2 (b) 4 (c) 7/10 (d) None of these

48. If p and q are pointer variables, which of the following operations is valid ?

(a) $p + q$ (b) $p - q$ (c) Both (1) and (2) (d) None of these

49. Area of the quadrilateral formed by the lines $|x| + |y| = 1$ is

(a) 4 (b) 2 (c) 8 (d) None of these

50. The gray code of $(01101010)_2$ is

(a) 01110111 (b) 01011111 (c) 10001000 (d) 10101000

51. Let $y = x^2 e^{-x}$, then the interval in which y increases with respect to x is

(a) $(-\infty, \infty)$ (b) $(-2, 0)$ (c) $(2, \infty)$ (d) (0, 2)

52. The parametric coordinates of any point on the parabola $y^2 = 4ax$ can be

(a) $(-at^2, -2at)$ (b) $(-at^2, 2at)$ (c) $(-a\sin^2 t, -2a\sin t)$ (d) $(-a\sin t, 2a\cos t)$

53. Let A be a square matrix of order $n \times n$ and k is a scalar, then adj (KA) is equal to

(a) k adj A (b) k^n adj A (c) k^{n-1} adj A (d) k^{n+1} adj A

54. The locus of the point of intersection of tangents to an ellipse at two points, sum of whose eccentric angles is constant, is a/an

(a) parabola (b) circle (d) ellipse (d) straight line

55. Most efficient way of impementing priority queue is by

(a) circular array (b) heap (c) B + tree (d) linked list

56. $\lim_{x \to \infty} (1 + 2/x)^x$ equals

(a) e (b) ∞ (c) e^2 (d) $1/e$

57. If a and $b\,(\neq 0)$ are the roots of the quadratic equation $x^2 + ax + b = 0$, then the least value of $x^2 + ax + b\,(x \in R)$ is

(a) 9/4 (b) $-9/4$ (c) $-1/4$ (d) 1/4

58. If $f(x) = a|\sin x| + b\, e^{(x)} + c|x|^3$ and if $f(x)$ is differentiable at $x = 0$, then

(a) $a = b = c = 0$ (b) $a = 0, b = 0; c \in R$ (c) $b = c = 0, a \in R$ (d) $c = 0, a = 0; b \in R$

59. Let $f(x)$ is a function differentiable at $x = c$, then $\lim_{x \to c} f(x)$ equals

(a) $f(c)$ (b) $f''(c)$ (c) $1/f(c)$ (d) None of these

60. If $x^y = e^{x-y}$, then dy/dx is equal to

(a) $(1 + \log x)^{-1}$ (b) $(1 + \log x)^{-2}$ (c) $\log x.(1 - \log x)^{-1}$ (d) None of these

61. Which of the following is false about virtual functions ?

(a) Pure virtual functions force the programmer to redefine the virtual function inside the derived classes

(b) We cannot have a virtual constructor, but we can have virtual destructor

(c) A virtual function cannot be a friend of another class

(d) Virtual functions cannot be static members

62. If $y^2 = ax^2 + bx + c$, where a, b, c are constants, then $y^3 \dfrac{d^3y}{dx^3}$ is

(a) a constant (b) a function of x (c) a function of y (d)a function of both x and y

63. If $y = \int_0^x f(t) \sin\{k(x-t)\}\, dt$, then $\dfrac{d^2y}{dx^2} + k^2 y$ equals

(a) 0 (b) y (c) $kf(x)$ (d) $k^2 f(x)$

64. If $\sqrt{x+y} + \sqrt{y-x} = c$, then $\dfrac{d^2y}{dx^2}$ equals

(a) 2/c (b) $-2/c^2$ (c) $2/c^2$ (d) None of these

65. The propagation of operations is referred as

(a) aggregation (b) association (c) triggering (d) None of the above

66. The maximum value of $(1/x)^x$ is equal to

(a) e (b) e^e (c) $e^{1/e}$ (d) $(1/e)^{1/e}$

67. The distance between the origin and the tangent to the curve $y = e^{2x} + x^2$ drawn at the point $x = 0$ is

(a) $\dfrac{1}{\sqrt{5}}$ (b) $\dfrac{2}{\sqrt{5}}$ (c) $\dfrac{-1}{\sqrt{5}}$ (d) $\dfrac{2}{\sqrt{3}}$

68. In C language sizeof ('a') returns

(a) 1 (b) 2 (c) 4 (d) 8

69. If the tangent at (1, 1) on $y^2 = x(2-x)^2$ meets the curve again at P, then P is

(a) (4, 4) (b) (– 1, 2) (c) (9/4,3/8) (d) None of these

70. The number of real roots of the equation $e^{x-1} + x - 2 = 0$ is

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

71. If $f(x) = kx - \sin x$ is monotonically increasing, then

(a) $k > 1$ (b) $k > -1$ (c) $k < 1$ (d) $k < -1$

72. The function $f(x) = a\sin x + (1/3)\sin 3x$ has maximum value at $x = \pi/3$. The value of a is

(a) 3 (b) 1/3 (c) 2 (d) 1/2

73. For any complex number z, the minimum value of $|z| + |z - 1|$ is

(a) 1 (b) 0 (c) 1/2 (d) 3/2

74. The sum of the magnitudes of two forces acting at a point is 18 and the magnitude of their resultant is 12. If the resultant is at 90^o with the force of similar magnitude, then magnitudes are

(a) 3, 15 (b) 4, 14 (c) 5, 13 (d) 6, 12

75. Given p and $(p \wedge - p) \rightarrow \neg$, proves

(a) $q \rightarrow p$ (b) $p \rightarrow q$ (c) p (d) q

76. The last three digits of a telephone number have been erased and all we know is that the number was 25785???. Assuming that all possibilities are equally likely, the probability that the missing digits are all equal to each other is

(a) 0.001 (b) 0.006 (c) 0.010 (d) 0.270

77. The value of integral $\int \frac{1 + x^2}{1 + x^4} dx$ is equal to

(a) $\tan^{-1} x^2 + C$ (b) $\frac{1}{\sqrt{2}} \tan^{-1}\left(\frac{x^2 - 1}{x\sqrt{2}}\right)$

(c) $\frac{1}{2\sqrt{2}} \log\left(\frac{x^2 + 1 + x\sqrt{2}}{x^2 + 1 - x\sqrt{2}}\right) + C$ (d) None of these

78. The value of the integral $\int_{-1}^{1} x|x| dx$ is

(a) 2 (b) 1 (c) 0 (d) 3

79. The bandwidth of an FM signal carrying a message signal of 12 MHz bandwidth is

(a) 24 MHz (b) 48 MHz (c) 96 MHz (d) 120 MHz

80. The area of the figure bounded by the curves $y = e^x$, $y = e^{-x}$ and the straight line $x = 1$ is

(a) $e + \frac{1}{e}$ (b) $e - \frac{1}{e}$ (c) $e + \frac{1}{e} - 2$ (d) None of these

81. If the letters of the word 'REGULATION' be arranged at random the probabiity that there will be exactly 4 letters between R and E is

(a) 1/10 (b) 1/9 (c) 1/5 (d) 1/2

82. If $\cos A + \cos B = m$ and $\sin A + \sin B = n$, where $m, n \neq 0$, then $\sin (A + B)$ is equal to

(a) $\frac{mn}{m^2 + n^2}$ (b) $\frac{2mn}{m^2 + n^2}$ (c) $\frac{m^2 + n^2}{2mn}$ (d) $\frac{mn}{m + n}$

83. What will be the output of the following '*C*' code ?

```
if ("abc" = = "abc")
print f ("Yes/n");
else
print f ("No/n");
```

(a) Yes (b) No

(c) Cannot be determined (d) None of these

84. The general solution of $\sin x - 3 \sin 2x + \sin 3x = \cos x - 3 \cos 2x + \cos 3x$ is

(a) $n\pi + \frac{\pi}{8}$ (b) $\frac{n\pi}{2} + \frac{\pi}{8}$ (c) $(-1)^n \left(\frac{n\pi}{2} + \frac{\pi}{8}\right)$ (d) $2n\pi + \cos^{-1}(3/2)$

85. The normal to a given curve is parallel to x-axis if

(a) $\frac{dy}{dx} = 0$ (b) $\frac{dy}{dx} = 1$ (c) $\frac{dx}{dy} = 0$ (d) $\frac{dx}{dy} = 1$

86. If G is an A belian group, then for all $a, b \in G$, $b^{-1} \times a^{-1} \times b \times a$ is equal to

(a) $a \times b$ (b) $a^{-1} \times b^{-1}$ (c) e (d) None of these

87. The additive group of integers is a cyclic group generated by

(a) 1 (b) 2 (c) 3 (d) None of these

88. The imaginary part of $\tan^{-1}(5i/3)$ is

(a) 0 (b) ∞ (c) log 2 (b) log 4

89. Two like forces of 5 N and 15 N act on a light rod at two points A and B respectively 6 m apart. The resultant force and the distance of its point of application from the point A are respectivey.

(a) 10 N, 4.5 m (b) 20 N, 4.5 m (c) 20 N, 1.5 m (d) 10 N, 1.5 m

90. X.25 has

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

91. The locus of the point of intersection of tangents to the parabola $y^2 = 4(x + 1)$ and $y^2 = 8(x + 2)$ which are perpendicular to each other is

(a) $x + 7 = 0$ (b) $x - y = 4$ (c) $x + 3 = 0$ (d) $y - x = 12$

92. A body of weight 60 kg rests on a rough horizontal plane, whose coefficient of friction is 2/3. The least force acting horizontally that would move the body is

(a) 10 kg wt (b) 50 kg wt (c) 40 kg wt (d) 39 kg wt

93. It the complex numbers $z1$, $z2$, $z3$ are in AP, then they lie on a/an

(a) circle (b) parabola (c) line (d) ellipse

94. Which one is contrapositive of $q \rightarrow p$?

(a) $p \rightarrow q$ (b) $\neg p \rightarrow \neg q$ (c) $\neg q \rightarrow \neg p$ (d) None of these

95. Which of the following is most appropriate about Software Debugging ?

(a) Process that shows presence of error

(b) Process that shows the presence of error and identifying the source of error

(c) Process that identifies the source of error and fixes it

(d) Process that shows the presence of error and identifying the source of error and fixes it

96. If the function $f : R \rightarrow A$ given by $f(x) = \dfrac{x^2}{x^2 + 1}$ is a surjection, then A is equal to

(a) R (b) [0, 1] (c) (0, 1] (d) [0, 1)

97. If a particle is projected varitcally upwards and is at a height h after t_1 seconds and again t_2 seconds, then its velocity of projection is

(a) gt_1t_2 (b) $gt_1t_2/2$ (c) $g(t_1 + t_2)/2$ (d) $g(t_1 + t_2)$

98. To avoid interference between channels, Bluetooth uses

(a) DSSS (b) FHSS (c) Both DSSS and FHSS (d) CDMA

99. $\neg \forall x P(x)$ is equivalent to

(a) $\exists x \neg P(x)$ (b) $\forall x \neg P(x)$

(c) $\neg \exists x P(x)$ (d) None of these

100. For a complete graph with 7 vertices, number of spanning tree is at least

(a) 64 (b) 63 (c) 127 (d) 128

101. If pth, qth and rth terms of a GP are x, y, z respectively, then $x^{q-r}\ y^{r-p}\ z^{p-q}$ is equal to

(a) 0 (b) 1 (c) -1 (d) None of these

102. Which of these conditions holds for a planar graph ?

(a) $v - e + r = 2$ (b) $v - r + e = 2$ (c) $e - v + r = 2$ (d) None of these

103. A graph G is called unicursal if and only if

(a) all vertices of G are of even degree (b) all vertices are of odd degree

(c) exactly two vertices are of even degree (d) exactly two vertices are of odd degree

104. A relation that is reflexive, antisymmetric and transitive is a/an

(a) function (b) equivalence relation (c) partial order (d) None of these

105. If A is a symmetric matrix and $n \in N$, then A^n is

(a) symmetric (b) skew-symmetric (c) a diagonal matrix (d) None of these

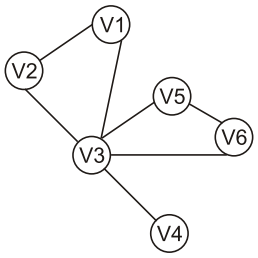
106. The value of a so that the function

$$f(x) = \begin{cases} \dfrac{1-\cos ax}{x \sin x}, & x \neq 0 \\ \dfrac{1}{2}, & x = 0 \end{cases}$$

be continuous at $x = 0$ is

(a) 1 (b) -1 (c) ± 1 (d) 0

107. In the graph below, what will be the result of DFS starting from the vertex V1 ?



(a) $V1, V2, V3, V6, V4, V5$ (b) $V1, V2, V3, V5, V6, V4$

(c) $V1, V2, V4, V3, V5, V6$ (d) $V1, V2, V3, V5, V4, V6$

108. If $\vec{\mathbf{a}}$, $\vec{\mathbf{b}}$ are unit vectors such that the vector $\vec{\mathbf{a}} + 3\vec{\mathbf{b}}$ is perpendicular to $7\vec{\mathbf{a}} - 5\vec{\mathbf{b}}$ and $\vec{\mathbf{a}} - 4\vec{\mathbf{b}}$ is perpendicular to $7\vec{\mathbf{a}} - 2\vec{\mathbf{b}}$, then the angle between $\vec{\mathbf{a}}$ and $\vec{\mathbf{b}}$ is

(a) $\pi/6$ (b) $\pi/4$ (c) $\pi/3$ (d) $\pi/2$

109. If the product of n positive integers is unity, then their sum is

(a) a positive number (c) divisible by n (b) equal to $n + 1/n$ (d) never less than n

110. If $\overline{X}_1$ and $\overline{X}_2$ are the means of two distributions such that $\overline{X}_1 < \overline{X}_2$ and $\overline{X}$ is the mean of the combined distribution, then

(a) $\overline{X} < \overline{X}_1$ (b) $\overline{X} > \overline{X}_2$ (c) $\overline{X} = \dfrac{\overline{X}_1 + \overline{X}_2}{2}$ (d) $\overline{X}_1 < \overline{X} < \overline{X}_2$

111. If a matrix A is such that $3A^3 + 2A^2 + 5A + 1 = 0$, then A^{-1} is equal to

(a) $-(3A^2 + 2A + 5)$ (b) $3A^2 + 2A + 5$ (c) $3A^2 - 2A - 5$ (d) None of these

112. The ends of the base of an isosceles triangle are at $(2a, 0)$, and $(0, a)$. The equation of one side is $x = 2a$. The equation of the other side is

(a) $x + 2y - a = 0$ (b) $x + 2y = 2a$ (c) $3x + 4y - 4a = 0$ (d) $3x - 4y + 4a = 0$

113. The mean age of a combined group of men and women is 25 years. If the mean age of the group of men is 26 and that of the group of women is 21 then the percentage of men and women in the group is

(a) 60, 40 (b) 80, 20 (c) 20, 80 (d) 40, 60

114. A reentrant code is one

(a) that can modify itself (b) that cannot modify itself

(c) that is non-shared (d) None of these

115. Consider a logical address space of 8 pages of 1024 words each mapped onto a physical memory of 32 frames. How many bits are there in logical and physical addresses respectively ?

(a) 3 and 5 (b) 10 and 5 (c) 13 and 15 (d) 13 and 13

116. If $\frac{2x}{x^3 - 1} = \frac{A}{x - 1} + \frac{Bx + C}{x^2 + x + 1}$, then

(a) $A = B = C$ (b) $A = B \neq C$ (c) $A \neq B = C$ (d) $A \neq B \neq C$

117. V.33 modem uses

(a) 64-QAM (b) 256-QAM (c) 128-QAM (d) 32-QAM

118. A body falling from a height of 10 m rebounds from a hard floor. It it loses 20% of its energy in impact, it will rise up to

(a) 10 m (b) 8 m (c) 5 m (d) 12 m

119. You have three coins in your pocket, two fair ones but the third biased with probability of heads p and tails $1 - p$. One coin selected at random drops to the floor, landing heads up. How likely is it is one of the fair coins ?

(a) p (b) $1/(1 + p)$ (c) 1/2 (d) None of the above

120. The cube roots of unity

(a) are collinear (b) Lie on a circle of radius $\sqrt{3}$

(c) form an equilateral triangle (d) None of these