2. The value of real θ such that $\dfrac{3+2i\sin\theta}{1-2i\sin\theta}$ is purely imaginary is **(JNUEE-2004)**
   (a) $n\pi$　　　　　　　　(b) $n\pi\pm\pi/2$
   (c) $n\pi\pm\pi/3$　　　　(d) $n\pi\pm\pi/6$

4. The coefficient of $x_1 x_2^2 x_3^3 x_4^4 x_5^5$ in the expansion of $(x_1 + x_2 + x_3 + x_4 + x_5)^{15}$ is **(JNUEE-2004)**
   (a) $1!2!3!r!5!$　　　　(b) 15, 14, 13, 12, 11
   (c) $15!/15$　　　　　　(d) $15!/1!2!3!4!5!$

5. Identify the binary tree for which the inorder and postorder traversals are as under.
   Inorder : AFCEDB
   Postorder : FEDCBA **(JNUEE-2004)**
   (a)　　　　(b)　　　　(c)　　　　(d)

6. In a triangle ABC the angle A is greater than the angle B. If the values of the angles A and B satisfy the equation $3\sin x - 4\sin^3 x - k = 0$, $0 < k < 1$, then the value of C is **(JNUEE-2004)**
   (a) $5\pi/6$　　　　　　(b) $2\pi/3$
   (c) $\pi/2$　　　　　　(d) $2\pi/3$

8. You are allowed to use 20 nodes to construct an AVL - tree (height balanced tree). What is its possible maximum height ? **(JNUEE-2004)**
   (a) 4　　(b) 5　　(c) 6　　(d) 7

9. The half - life of a radioactive substance is the time required for one half of that substance to decay. The amount of 11C, an isotope of carbon present at a funture time t (m months) is given by A (t) = 100 exp [- 0.0331]. The half - life of the material in months is **(JNUEE-2004)**
   (a) ln 2　　　　　　　(b) 0.0338
   (c) ln 2/0.0338　(d) 2 ln 2

10. A file of size n = 100 takes 6 ms for sorting using Quicksort algorithm. Then approximately how much time would it take to sort a file of size n = 100000000 ? **(JNUEE-2004)**
    (a) 24000000　　　　(b) 24 ms
    (c) 240000 ms　　　(d) 18000000 ms

11. Solve $z^5 = 1$, for z **(JNUEE-2004)**
    (a) $z = e^{2x\,in}$, n = 0, 1, 2...　(b) $z = e^{2x\,in/5}$, n = 0, 1, 2..
    (c) $z = e^{x\,in/5}$, n = 0, 1, 2 ...　(d) $z = e^{5x\,in}$, n = 0, 1, 2,...

14. Assume that an upper triangular matrix a [0 .... 99, 0...99] is stored in alinear array h (0... 5049] in lexicographical (row by row) order. If a [0, 0] is stored in h[0], where is a [80, 90] stored in the arry h ? **(JNUEE-2004)**
    (a) 4851　　(b) 4850　　(c) 3330　　(d) 4175

15. Consider the following C function :
    unsigned try (unsigned x, int p, int n)
    {
    return (x > > (p + 1 - n)) & - (- 0 < < n) ;
    }
    what would be the output of try (x, 8, 5) for x = 1110111011101110 ? **(JNUEE-2004)**
    (a) 10111　　(b) 11101　　(c) 01110　　(d) 11011

16. An observer at an anti - aircraft post A identifies an enemy aircraft due east of his post at an angle of elevation of 60^0. At the same instant a detection post D situated 4 km south of A reports the aircraft at an elevation of 30^0. The altitude at which the plane is flying is **(JNUEE-2004)**
    (a) $4\sqrt{3}\,km$　　　(b) $2/\sqrt{3}\,km$
    (c) $\sqrt{6}\,km$　　　(d) 6 km

17. A Winchester - style disc has its head currently located at track 64. Given the reference string (88, 90, 8, 11, 10, 41) representing the (ordered) sequence of requests for disc tracks, the total number of tracks traversed by the disc head under the SSFT is **(JNUEE-2004)**
    (a) 108　　(b) 138　　(c) 139　　(d) 109

19. Suppose that the expected number of accidents per week at an industrial plant is 4. The number of workers injured in each accident is independent random variable with a common mean of 2. Assume also that the number of workers injured in each accident is independent of the number of accidents that occur. The expected number of injures during a week is **(JNUEE-2004)**
    (a) 2　　(b) 4　　(c) 6　　(d) 8

20. The concept of virtual memory **(JNUEE-2004)**
    (a) allows one user to use all the memory available
    (b) allows Virtual Reality programs to run
    (c) allows a user program to run on another computer which is connected on a network
    (d) provides a user program with an address space larger than the amount of physical memory

21. If a, b, c are all different from zero, and $\Delta = \begin{vmatrix} 1+a & b & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}$ is equal to zero, then the value of $a^{-1} + b^{-1} + c^{-1}$ is **(JNUEE-2004)**
    (a) abc　　　　　　　(b) $a^{-1} b^{-1} c^{-1}$
    (c) -a - b - c　　　(d) N.O.T.

22. The ratio of the altitude of the cone of gretest volume which can be inscribed in a given sphere, to the diameter of the sphere is **(JNUEE-2004)**
    (a) 1/4　　(b) 3/4　　(c) 1/3　　(d) 2/3

23. Let G = (V, E), E (e1, e2, e3, e4, e5, e6, e7, e8, e9, e10, e11, e12, e13) be a graph with a circuit C = (e1, e2, e3, e5, e6, e8, e9, e11). Which of the following may be a cut - set of G ? **(JNUEE-2004)**
    (a) S = (e1, e2, e3)　　　　(b) S = (e3, e4, e5, e8)
    (c) S = (e2, e3, e4, e7, e9)
    (d) S = (e4, e5, e6, e10, e12)

25. Which of the following partially ordered sets is a tree ?
    (JNUEE-2004)
    (a) The set of all binary strings of length ≤ 10, partially ordered by v $\leq$ w if w is a subtracting v
    (b) The set of all termary strings of length ≤ 10, partially ordered by v $\leq$ w if w is a initial subtracting v
    (c) The set of all binary strings of length ≤ 2, partially ordered by v $\leq$ w if w is a subtracting v
    (d) The set of all termary strings of length ≤ 2, partially ordered by v $\leq$ w if v is an initial subtracting of w.

26. Given that $\log_{10} x^2 y^2 = 6$ and $\log_{10} (x/y) = 2$, then x and y respectively are **(JNUEE-2004)**
    (a) $\sqrt{D}, 100\sqrt{0}$
    (b) 100, 1
    (c) $100\sqrt{0}, \sqrt{0}$
    (d) 1000, 10

28. Which of the following is a group ? **(JNUEE-2004)**
    (a) Rational numbers under x
    (b) Positive rational numbers under +
    (c) {1, 3, 5, 7} under x mod 8
    (d) {1, 2, 3,4,5,6,7) under x mod 8

30. Let X and Y be independent random variables with means μ_x and μ_y and variances σ_x^2 and σ_y^2. Then, Var (XY) equals. **(JNUEE-2004)**
    (a) $\sigma_x^2 \, \sigma_y^2$
    (b) $\sigma_x^2 \, \sigma_y^2 + \mu_y^2\sigma_x^2 + \mu_x^2\sigma_y^2$
    (c) $\mu_y^2\sigma_x^2 + \mu_x^2\sigma_y^2$
    (d) $(\sigma_x \, \sigma_y)^2$

32. Fetching decoding and executing of an instruction is broken down into several time intervals. Each of these intervals involving one or more clock periods is called a/an **(JNUEE-2004)**
    (a) instruction cycle
    (b) interpretation cycle
    (c) machine cycle
    (d) process cycle

36. The round - off error when the number 8.987652 is rounded to five significant digits is **(JNUEE-2004)**
    (a) - 0.00048
    (b) - 0.000048
    (c) 0.00048
    (d) 0.04800

37. The addressing mode used in instruction LDA 0345 H is
    (JNUEE-2004)
    (a) direct
    (b) indirect
    (c) induced
    (d) immediate

39. Let α and x_0 be positive numbers and define the sequence $(x_n)_{n=1}^{\infty}$ recursively by $x_n = \frac{1}{2}\left(x_{n-1} + \frac{\alpha}{x_{n-1}}\right)$. The sequence $y_n = \frac{x_n}{\sqrt{\alpha}}$ converges. Its limit is **(JNUEE-2004)**
    (a) 1
    (b) - 1
    (c) $\sqrt{\alpha}$
    (d) 4α

40. Which of the following is not a DBA function ?
    (JNUEE-2004)
    (a) User coordination
    (b) Backing-up the database
    (c) Writing queries
    (d) Database design

41. The principal value of $\sin^{-1}[\sin(2\pi/3)]$ is **(JNUEE-2004)**
    (a) $\pi/3$
    (b) $-2\pi/3$
    (c) $2\pi/3$
    (d) $3\pi/3$

42. The three lines ax + by + c = 0, bx + cy + a = 0 and cx + ay + b = 0 are congruent only when **(JNUEE-2004)**
    (a) a + b + c = 0
    (b) $a^2 + b^2 + c^2$ - ab - bc - ca = 0
    (c) $a^3 + b^3 + c^3 + 3abc = 0$
    (d) $a^3 + b^3 + c^3 - a^2b - b^2c - c^2a = 0$

44. Referential integrity in SQL is represented by
    (JNUEE-2004)
    (a) foreign key
    (b) primary key
    (c) candidate key
    (d) super key

45. The disadvantage of passing parameters by value into subprograins is **(JNUEE-2004)**
    (a) shallow binding and ad binding
    (b) additional storage for the formal parameter and the data transfer cost
    (c) pass-by-value-result ambiguity and additional recursive overhead
    (d) pretotype overloading and garage collection overhead

47. If $\cos^{-1} p + \cos^{-1} q + \cos^{-1} r = \pi$, $p^2 + q^2 + ... = 1$
    (JNUEE-2004)
    (a) $2p^2 q^2 + r^2 + 4pqr$
    (b) $r^2 + 2pqr$
    (c) $r^2 + 2pqr -1$
    (d) N.O.T.

48. If $f(x) = k \, \exp\left(-\frac{1}{2}x^2\right)$ for $x \in R$; can be a probability density function for **(JNUEE-2004)**
    (a) k = 1
    (b) $k = 2\pi$
    (d) $k = (2\pi)^{-1/2}$
    (d) $k (2\pi)^{-1}$

49. Let $A_i = (1, 2, 3, ..., i)$ for $i = 1, 2, 3, ...$ Then $\bigcup_{i=1}^{n} A_i$ and $\bigcap_{i=1}^{n} A_i$ respectively are **(JNUEE-2004)**
    (a) (1, 2, 3, ..., n) and (n)
    (b) (1, 2, 3, ...n) and (1)
    (c) (1, 2, 3, ..., n) and (1, 2, 3,....n)
    (d) (1, 2, 3, ...,n) and (1, 2, 3,.... n)

50. Identity the error in the following : **(JNUEE-2004)**
    int myfunc (flot ver 1, int k, int i = 0, int j)
    (a) int i = 0 should not be used
    (b) the function cannot return int and therefore the return type be void
    (c) since i has been given the default value all order variables also must have the same default value
    (d) since i has been given the default, j also should have a default value

52. Solution of $x_n = x_{n-1} + 12n^2$, where $x_0 = 5$, is
    (a) $x_n = r + n (n + 1)$
    (b) $x_n = r + 2n (n + 1) (2n + 1)$
    (c) $x_n = 3 + (n + 2)$
    (d) $x_n = 3n + 2n (n + 1)$ **(JNUEE-2004)**

53. Let x and y be independent random variables with binomial distribution B (10, 1/3) and B (20, 1/3) respectively. E(x + y) is **(JNUEE-2004)**
    (a) 5
    (b) 10
    (c) 15
    (d) 30

55. A SRS (Software Requirement Specification) describes
    (a) functional requirements
    (b) non-functional requirements **(JNUEE-2004)**
    (c) the information flow
    (d) All of the above

56. The limitation of BNF is that **(JNUEE-2004)**
    (a) it always defines ambiguous syntactic features (terms) of a language
    (b) syntax diagrams are simpler alternative tool to define

syntax of a language

(c) it cannot specify the context free aspects of the syntax of a language

(d) it can only specify the context free aspects of the syntax of a language

57. The smallest positive value of x (in degree) for which $\tan (x + 100^0) = \tan (x + 50^0) \tan (x) \tan (x - 50^0)$ is **(JNUEE-2004)**

(a) 75^0 (b) 60^0 (c) 45^0 (d) 30^0

58. If a, b, c are distinct and $\begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix} = 0$ then x is equal to **(JNUEE-2004)**

(a) 0   (b) a   (c) b   (d) abc

59. If p, q, r be three positive numbers, then the value of (p + q) (q + r) (r + p) is **(JNUEE-2004)**

(a) $< 4pqr$ (b) < 8 pqr

(c) > 8 pqr   (d) > 4 pqr but < 8 pqr

60. Observe the following program carefully and select the appropriate print f ( ) statement from the options :

```
struct month
{
char *month ;
}
void main (  )
stuct month m = (“may”) ;
.........
```
(JNUEE-2004)

(a) printf (“/n Month : %s”, m.month);

(b) printf (“/n Month : %s, month $\rightarrow$ month) ;

(c) printf (“/n Month : %s, m * month) ;

(d) print f (“n/ Month : %s, *m month)

61. If $x_r = \cos (\pi /2^r) + \sin (\pi /2^r)$, then $x_1 x_2 x_3...$ to ∞ is **(JNUEE-2004)**

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

62. If $A \cap B = \phi \ and \ B \cap C = \phi,$ then $P(A \cup B \cup C) =$

(a) P (A) + P (B) + P (C)   **(JNUEE-2004)**

(b) P (A) P (B) P (C)

(c) P (A) P (B) + P (B) P (C) + P (C) P (A)

(d) $P(A \cap B) + P(B \cap C)$

64. The encoding scheme that uses both polarities and zero to represent binary 1 to 0 is **(JNUEE-2004)**

(a) bi - phase   (b) bipolar

(c) polar   (d) unipolar

65. In a triangle ABC, if cot A, cotB and cotC are in AP, then $a^2 b^2 c^2$ are in **(JNUEE-2004)**

(a) AP   (b) GP   (c) HP   (d) N.O.T.

66. The value of determinant $\Delta = \begin{vmatrix} a^2 & a & 1 \\ \cos(nx) & \cos((n+1)x) & \cos((n+2)x) \\ \sin(nx) & \sin((n+1)x) & \sin((n+2)x) \end{vmatrix}$ is independent of **(JNUEE-2004)**

(a) n   (b) a   (c) x   (d) N.O.T.

67. For $n \in N,$ 3^{2n+2} - 8n - 9 is divisible by **(JNUEE-2004)**

(a) 81   (b) 72   (c) 64   (d) 49

68. A point P is chosen at random on a line AB of length 2*l*. The probability $P[(AP \times BP) > l^2/2]$ is **(JNUEE-2004)**

(a) $1/2$ (b) $1/\sqrt{2}$

(c) $(1-1/\sqrt{2})l$ (d) $1/\sqrt{2}l$

69. In a cellular netwrok, the distance between two adjacent hexagonal cells with radius R is **(JNUEE-2004)**

(a) R   (b) $R\sqrt{2}$ (c) $R\sqrt{3}$ (d) $R\sqrt{(3/2)}$

70. Solution of the equation $e^{\sin x} - e^{-\sin x} = 4$ is **(JNUEE-2004)**

(a) $\sin^{-1} h \left(\frac{4+\sqrt{7}}{2} \right)$ (b) $\sin^{-1} h \left(\frac{4-\sqrt{7}}{2} \right)$

(c) $\sin^{-1} \left(\frac{4+\sqrt{7}}{2} \right)$ (d) $\sin^{-1} \left(\frac{4-\sqrt{7}}{2} \right)$

74. AAL2 protocol in ATM supports **(JNUEE-2004)**

(a) connectionless, constant - bit rate real - time applications

(b) connection - oriented, variable - bit rate non real - time applications

(c) connection - oriented, constant - bit rate real - time applications

(d) connection - oriented, variable - bit rate real - time applications

75. The value of $\frac{1}{\sin 0^0} - \frac{\sqrt{3}}{\cos 0^0}$ is **(JNUEE-2004)**

(a) 2   (b) 4   (c) $2\sqrt{2}$ (d) $\sqrt{2}$

76. The solution set of the equation $\log_2(3 - x) + \log_2 (1 - x) = 3$ is **(JNUEE-2004)**

(a) {- 1}   (b) {5}   (c) (-1, 5)   (d) ϕ

77. The real solution of the following simultaneous equations is $xy + 3y^2 - x + 4y - 7 = 0$ and $2xy + y^2 - 2x - 2y + 1 = 0$ **(JNUEE-2004)**

(a) x = 0, y = 1 (b) x = 1, y = 0

(c) x = - 2, y = 3   (d) x = 2, y = - 3

78. Which of the following is the function of mid-term scheduler in a time-sharing system ? **(JNUEE-2004)**

(a) Swapping

(b) Controlling degree of multiprogramming

(c) Context-switching   (d) Process creation

79. In a triangle ABC, a : b :c = 4 : 5 : 6. The ratio of the radius of the circumcircle to that of the incircle is **(JNUEE-2004)**

(a) 7/16   (b) 9/16   (c) 16/9   (d) 16/7

80. The polar exponential from the complex number $\frac{1}{2} + \frac{\sqrt{3}}{2} l$ is **(JNUEE-2004)**

(a) $e^{(3\pi i/2)+2\pi k}$, $k = 0, \pm 1, \pm 2$

(b) $e^{(\pi i/3)+2\pi k}$, $k = 0, \pm 1, \pm 2$

(c) $e^{2\pi k}$, $k = 0, \pm 1, \pm 2$

(d) $\sqrt{2} e^{-(3\pi /2)+2\pi k}$, $k = 0, \pm 1, \pm 2$

81. A random variate has the following distribution

x:	0	1	2	3	4	5	6	7
p(x):	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2 + k$

The value of k is **(JNUEE-2004)**

(a) 0.1   (b) - 0.1   (c) - 1   (d) 1

82. If $\sin \alpha$, $\cos \alpha$ are the roots of the equation $px^2 + qx + r = 0$, then **(JNUEE-2004)**

(a) $p^2 - q^2 + 2pr = 0$ (b) $p^2 + q^2 - 2pr = 0$

(c) $(p + r)^2 = q^2 - r^2$ (d) $(p - r)^2 = q^2 + r^2$

85. Which one of the following file allocation methods is used by Unix operating system ? **(JNUEE-2004)**
(a) Contiguous allocation   (b) Indexed allocation
(c) Linked allocation   (d) Bit Vector

86. The voltage across a register is a random E uniform between 5V and 10V. Given the resistance of the register $R = 1000\Omega$, the probability density function of power $W = E^2/R$ dissipated in R is **(JNUEE-2004)**
(a) $\dfrac{1}{5}, 5 \le \omega \le 0$ (b) $\dfrac{1}{5}, 3 \le \omega \le 100$
(c) $\omega^{-1/2}, \dfrac{1}{4} < \omega < \dfrac{1}{0}$ (d) $\sqrt{0}\, \omega^{-1/2}, \dfrac{1}{4} < \omega < \dfrac{1}{0}$

87. If $x = \log_3 5$, $y = \log_{17} 25$, which of the following is correct
(a) $x < y$ (b) $x = y$ **(JNUEE-2004)**
(c) $x > y$ (d) Not comparable

88. The minimum number of page frames that must be allocated to a process is defined by **(JNUEE-2004)**
(a) average page fault rate   (b) paging hardware
(c) instruction - set architecture
(d) amount of available physical memory

89. If $A + B + C = 2S$, then $\cos^2 S + \cos^2(S - A) + \cos^2(S - B) + \cos^2(S - C) = 2 + \dots$ **(JNUEE-2004)**
(a) cos A cos B cos C   (b) 2 cosA cosB cos C
(c) cos (B + C) cos (B - C)   (d) N.O.T.

90. In which of the following cases overflow is detected by observing carry into the sign bit position and carry out of the sign bit position in fixed -point representation ?
(a) Adding two numbers of the same sign
(b) Adding two opposite sign numbers
(c) Adding two unsigned numbers
(d) Subtracting unsigned numbers   **(JNUEE-2004)**

91. If $\tan \chi = \dfrac{a-b}{a+b} \cot \dfrac{c}{2}$, $c = \dfrac{\dots}{\cos \chi}$ then **(JNUEE-2004)**
(a) (a + b) sin c/2 tan c/2   (b) (a - b) sin c/2
(c) (a + b) sin c/2   (d) (a - b) tan c/2 cosec c/2

93. The value of x for which $\log_3 2$, $\log_3 (2^x - 5)$ and $\log_3 (2^x - 7/2)$ are in arithmetic progression is **(JNUEE-2004)**
(a) 2   (b) 3   (c) 5   (d) 7

94. A random variate X has the following p. m. f. $P(X = j) = (1 - p) p^j$, $j = 0, 1, 2$ $0 < p < 1$ for any two positive integers m and n $p (X > m + n| X > m)$ equals
(a) $p (X < m + n)$ (b) $p (X > m)$
(c) $p (X > n)$ (d) $p(X \ge n)$

95. If $\tan A = \dfrac{(1 - \cos B)}{\sin B}$, then B equals **(JNUEE-2004)**
(a) $\dfrac{(A - n\pi)}{2}$ (b) $n\pi - A$
(c) $2(A - n\pi)$ (d) $A/2 - n\pi$

96. A set contains (2n + 1) elements. The number of subsets of the set which contain at most n elements is **(JNUEE-2004)**
(a) 2^{2n} (b) 2^n (c) 2^{n-1} (d) 2^{n+1}

97. Given the difference equation $y_{k+3} - 2y_{k+2} - 5y_{k+1} + 6y_k = 0$ for all k. Set $X_k = \begin{bmatrix} y_k \\ y_{k+1} \\ y_{k+2} \end{bmatrix}$. The difference equation can be rewritten as $X_{k+1} = AA_k$, where A is **(JNUEE-2004)**

(a) $\begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ -6 & 0 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 6 & -5 & -2 \end{bmatrix}$

(c) $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 6 & 5 & 2 \end{bmatrix}$ (d) $\begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ -6 & 5 & 2 \end{bmatrix}$

98. Which of the following is NOT a characteristic of RISC architecture ? **(JNUEE-2004)**
(a) One instruction per cycle
(b) Emphasis on register - to - register operations
(c) Small instruction size
(d) Large number of addressing modes

99. Given the following program segment :
Switch (num)
{
case 0 : print f ("%d", num + 1) ; break ;
case 1 : print f ("%d", num + 2) ; break ;
case 2 : print f ("%d", num + 1) ;
case 3 : print f ("%d", num + 2) ;
case 4 : print f ("%d", num + 3) ; break ;
default : print f ("%d", num) ;
}
The values (s) printed by this segment for initial value of num = 2 is /are **(JNUEE-2004)**
(a) 3 4 5   (b) 2 3 4   (c) 3 4 5 2   (d) 2 3 4 2

104. If $\omega, \omega^2, \dots, \omega^{n-1}$ are the nth root of unity, then $(2 - \omega)(2 - \omega^2)\dots(2 - \omega^{n-1})$ equals **(JNUEE-2004)**
(a) 0   (b) n   (c) $2^n - 1$ (d) $\displaystyle\sum_{r=1}^{n} r\left(\dfrac{n}{r}\right)$

106. In a triangle, the lengths of the two larger sides are 10 and 9 respectively. If the angles are in AP, then length of the third side is **(JNUEE-2004)**
(a) $5 + \sqrt{6}$ (b) 5   (c) $3\sqrt{3}$ (d) $5\sqrt{6}$

107. If a, b, c are co-planer vectors and a, b are non-collinear, then $\begin{vmatrix} a & b \\ b & b \end{vmatrix} a + \begin{vmatrix} a & a \\ b & b \end{vmatrix} b$ **(JNUEE-2004)**
(a) $\begin{vmatrix} a & b \\ b & b \end{vmatrix} c$ (b) $\begin{vmatrix} a & b \\ b & b \end{vmatrix} c$ (c) c   (d) 0

108. If a, b, c are in G.P., and (log a - log 2b), (log 2b - log 3c) and (log 3c - loga) are AP, then a, b, c are the length of the sides of a triangle which is **(JNUEE-2004)**
(a) equilateral   (b) acute-angled
(c) right-angled   (d) obtuse - angled

109. The Newton's method for finding the root of an equation f (x) = 0 converges if $f'(x_n)$ is **(JNUEE-2004)**
(a) 1   (b) 0   (c) large   (d) small

110. The value of a for which the system of equations $a^3 x (a + 1)^3 y + (a + 2)^3 z = 0$, $ax + (a + 1) y + (a + 2) z = 0$, $x + y + z = 0$ has a non-zero solution is **(JNU-2004)**
(a) 1   (b) 0   (c) - 1   (d) N.O.T.

111. If $\angle A = 5^0$ and $\angle B = 3^0$, what is the value of side b?

(a) $(a + c\sqrt{2})$ (b) $(a/2) + c\sqrt{2}$

(c) (a + c)/2   (d) $(a + c\sqrt{2})/2$ **(JNUEE-2004)**

112. $\binom{m+n}{k} = A \sum_{i=0}^{k} \binom{m}{i}\binom{n}{k-i}$, where A is   **(JNUEE-2004)**

(a) $\binom{n}{k}$ (b) 2^{m+n} (c) 2^n (d) 1

113. If $\vec{a} = i + 2j + 2k$ and $\vec{b} = 3i | 6j + 2k$, the vector in the direction of a and having a magnitude as |b| is

(JNUEE-2004)

(a) 7 (i + 2j + 2k)   (b) 7/9 (i + 2j + 2k)

(c) 7/5 (i + 2j + 2k)   (d) 7/3 (i + 2j + 2k)

114. In a committee of 47 persons 13 take tea but not coffiee and 28 take tea. The number of persons taking coffiee but not tea is   **(JNUEE-2004)**

(a) 6   (b) 19   (c) 32   (d) 34

116. Consider the language $L = \{0^n 1^m \mid n, m \geq 1\}$ Which of the following sets of production rules generate L ?

(JNUEE-2004)

I. E $\rightarrow$ 0E1 |E1+ 01

II. S $\rightarrow$ 0A |B1 ; A $\rightarrow$ 0A |B| 0 ; B $\rightarrow$ B1 |A| 1

III. A $\rightarrow$ 0A 1 |01

IV. S $\rightarrow$ 0X |X1| 01

(a) only I   (b) I and II

(c) I, II and III   (d) I, II, III and IV

117. If $\dfrac{3 + 5 + 7 + \ldots + n \, terms}{5 + 8 + 1 + \ldots + 0 \, terms} = 7,$ the value of n is

(JNUEE-2004)

(a) 49   (b) 42   (c) 37   (d) 35

118. If an m/m/1 queue, the inter - arrival time distribution is

(a) Erlang   (b) General

(c) Deterministic   (d) Exponential

119. The value of $\cos\dfrac{2\pi}{5} \cos\dfrac{4\pi}{5} \cos\dfrac{8\pi}{5} \cos\dfrac{6\pi}{5}$ is

(JNUEE-2004)

(a) 1/8   (b) 3/16   (c) 1/16   (d) 3