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- If $y = \tan^{-1} \left\{ \frac{1+x}{1-x} \right\}$, then $\frac{dy}{dx}$ is equal to
 - $\frac{2}{1+x^2}$
 - $\frac{1}{1+2x^2}$
 - $\frac{1-x^2}{1+x^2}$
 - $\frac{1}{1+x^2}$
- If $y = \log(\tan x)$, then $\frac{dy}{dx}$ is equal to
 - $2\operatorname{cosec} 2x$
 - $2\sec 2x$
 - $2\sin 2x$
 - $2\cos 2x$
- If $y = \cos^{-1} x$ and $z = \sin^{-1} \sqrt{1-x^2}$ then $\frac{dy}{dz}$ is equal to
 - $\frac{1}{1-x^2}$
 - 1
 - $\frac{1}{1+x^2}$
 - $\frac{x}{1-x^2}$
- If $y = e^{2x}$, then $\frac{d^2y}{dx^2} \cdot \frac{d^2x}{dy^2}$ is equal to
 - $-2e^x$
 - $-2e^{2x}$
 - $-2e^{-2x}$
 - $-2e^{-x}$
- If $\sqrt{x+y} + \sqrt{y-x} = \sqrt{2}$, then $\frac{d^2y}{dx^2}$ is equal to
 - 1
 - 2
 - $\frac{1}{2}$
 - 2
- $\lim_{x \rightarrow 0} \frac{1-\cos x}{x^2}$ is equal to
 - 0
 - $\frac{1}{2}$
 - $\frac{1}{4}$
 - 1
- $\lim_{x \rightarrow \infty} (x - \sqrt{x^2 + x})$ is equal to
 - $\frac{1}{2}$
 - 1
 - 1
 - $-\frac{1}{2}$
- $\int \frac{dx}{x \log x \log(\log x)}$ is equal to
 - $\log x$
 - $\log(\log x)$
 - $\log(\log(\log x))$
 - $(\log(\log x))^2$
- $\int x^x (1 + \log x) dx$ is equal to
 - x^x
 - $x^x \log x$
 - $\frac{x^x}{\log x}$
 - $\frac{x^x}{a+x}$
- $\int_0^1 \frac{x}{(1-x)^{3/4}} dx$ is equal to
 - 12/5
 - 12/5
 - 16/5
 - 16/5
- Let A and B are two disjoint subsets of a universal set E . The $(A \cup B) \cap B'$ is equal to
 - E
 - ϕ
 - A
 - B
- $(A - B) - A$ is equal to
 - ϕ
 - A
 - B
 - $A \cap B$
- Let 10 is the cardinality of set A . The number of bijective mapping from set A to itself is
 - 10
 - 55
 - 100
 - 3628800
- Let n be a positive decimal integer. The number of digits in n is equal to ...
 - $\lceil \log_{10} n \rceil + 1$
 - $\lfloor \log_{10} n \rfloor + 1$
 - $\lceil \log_{10} n \rceil$
 - $\lfloor \log_{10} n \rfloor$
- Let cardinality of the set A and B are 2 and 5 respectively. The number of relations from A^S to B is
 - 1024
 - 1000
 - 1010
 - 1025
- Let $f: R \rightarrow R, g: R \rightarrow R$ be two functions given by $f(x) = 2x - 3$ and $g(x) = x/2$. The $(f(g))^{-1}(x)$ is equal to
 - $\frac{x+3}{2}$
 - $x + 3$
 - $2x + 3$
 - $2x - 4$
- Let $f: R \rightarrow R$ is defined by $f(x) = x^2 + 5$, then value of $f^{-1}(4)$ is equal to
 - +1
 - 1
 - ϕ
 - 20
- If $g: R \rightarrow R$ is defined by $g(x) = x^2 - 2$, then value of $g^{-1}(23)$ is equal to
 - ± 5
 - 25
 - ± 4
 - 527
- Let cardinality of A and B are 3 and 10 respectively. The number of one one functions from A to B is.
 - 2^{10}
 - 2^2
 - 101
 - 720
- Let $A = \{1,2,3,4\}$ and $B = \{a,b\}$ are two sets. The number of subjective mappings from A to B is ...
 - 14
 - 16
 - 2^8
 - $8!$
- Let $z = \sqrt{3} + i$ be a complex number and \bar{z} be its conjugate. The $|\arg z| + |\arg \bar{z}|$ is equal to
 - $\frac{\pi}{3}$
 - $\frac{2\pi}{3}$
 - $\frac{\pi}{6}$
 - $\frac{\pi}{4}$
- The $\frac{(\sqrt{3}+i)^{17}}{(1-i)^{50}}$ is equal to
 - $\frac{-1-\sqrt{3}i}{2^9}$
 - $\frac{1+\sqrt{3}i}{2^9}$
 - $\frac{-1-\sqrt{3}i}{2^8}$
 - $\frac{1+\sqrt{3}i}{2^8}$
- For which of the following value of x , the $\left(\frac{1+i}{1-i}\right)^x = 1$ is
 - 29
 - 35
 - 34
 - 68





24. If ω is a cube root of unity, then the value of $(1 - \omega - \omega^2)(1 + \omega^3)$ is
 (a) 2 (b) 4
 (c) ω (d) ω^2
25. Let z be a complex number. Which of the following is a solution of $|z| - z = 1 + 2i$?
 (a) $\frac{3}{2} + 2i$ (b) $2 - \frac{3}{2}i$
 (c) $\frac{3}{2} - 2i$ (d) $2 + \frac{3}{2}i$
26. If $\sin \theta + \operatorname{cosec} \theta = 2$, then $\sin^n \theta + \operatorname{cosec}^n \theta$ is equal to
 (a) 1 (b) 2
 (c) 2^n (d) $2^n - 1$
27. The value of $\sin^6 x + \cos^6 x + 3\sin^2 x \cos^2 x$ is equal to
 (a) 3 (b) 2
 (c) 1 (d) 0
28. If $x = a \cos^2 \theta \sin \theta$ and $y = a \sin^2 \theta \cos \theta$ then $(x^2 + y^2)^3$ is equal to
 (a) $a^2 x^2$ (b) $a^2 x^2 y^2$
 (c) $a^2 (y^2 - x^2)$ (d) $a^2 (x^2 - y^2)$
29. The minimum value of $3 \cos \theta + 4 \sin \theta + 10$ is equal to
 (a) 5 (b) 9
 (c) 7 (d) 3
30. $\sin 6^\circ \sin 42^\circ \sin 66^\circ \sin 78^\circ$ is equal to
 (a) $\frac{1}{32}$ (b) $\frac{1}{16}$ (c) $\frac{1}{8}$ (d) $\frac{1}{4}$
31. If 20th term of an AP is 30 and its 30th term is 20, then the 10th term is
 (a) 40 (b) 10
 (c) 20 (d) 30
32. Let sum of n terms of an AP is $2n(n - 1)$, then the sum of their squares is
 (a) $\frac{8n(n-1)(2n-1)}{3}$ (b) $\frac{8n(n-1)(2n-1)}{6}$
 (c) $\frac{n(n+1)(2n+1)}{6}$ (d) $\frac{8n(n+1)(2n+1)}{3}$
33. For what value of x , the $\log_2(5 \cdot 2^x + 1)$, $\log_4(2^{1-x} + 1)$ and 1 are in AP ?
 (a) $\log_2 5$ (b) $\log_5 2$
 (c) $1 + \log_2 5$ (d) $1 - \log_2 5$
34. If the ratio of sum of m terms and n terms of an AP be $m^2 : n^2$, then the ratio of the m^{th} and n^{th} term will be
 (a) $m : n$ (b) $2m - 1 : 2n - 1$
 (c) $m + n : n + 1$ (d) $n : m$
35. The value of $9^{1/3} \times 9^{1/9} \times 9^{1/27} \times \dots \infty$ is
 (a) 3 (b) 9
 (c) 1 (d) ∞
36. If α and β are the roots of equation $x^2 + px + p^2 + q = 0$, then the value $\alpha^2 + \alpha\beta + \beta^2 \dots$
 (a) p (b) $-p$
 (c) q (d) $-q$
37. If the roots of $x^2 - bx + c = 0$ are two consecutive numbers, then $b^2 - 4c$ is equal to
 (a) 1 (b) 2
 (c) 3 (d) 4
38. The number of the real roots of the equation $(x - 1)^2 + (x - 2)^2 + (x - 3)^2 = 0$ is ...
 (a) 0 (b) 1
 (c) 2 (d) 3
39. If the roots of the equation $(b - c)x^2 + (c - a)x + (a - b) = 0$ be equals, then a, b, c are in ...
 (a) HP (b) GP
 (c) AP (d) None of these
40. If the equations $x^2 + 2x + 3\lambda = 0$ and $2x^2 + 3x + 5\lambda = 0$ have a non - zero common root, then λ is equal to
 (a) 1 (b) -1
 (c) 2 (d) -2
41. If ${}^n P_r = {}^n P_{r+1}$ and ${}^n C_r = {}^n C_{r-1}$, then (n, r) is ...
 (a) (2,3) (b) (3,2)
 (c) (4,3) (d) (3,4)
42. The number of arrangements of the letters of the word BANANA in which the two letters N do not appear adjacently is
 (a) 40 (b) 60
 (c) 80 (d) 100
43. The sum $(n + 1)$ terms of the series $\frac{c_0}{2} - \frac{c_1}{3} + \frac{c_2}{4} - \frac{c_3}{5} + \dots$ is
 (a) $\frac{1}{n+1}$ (b) $\frac{1}{n+2}$
 (c) $\frac{1}{n(n+1)}$ (d) $\frac{1}{(n+1)(n+2)}$
44. If ω is a cube root of unity, then $\begin{vmatrix} 1 & \omega & \omega^2 \\ 1 & \omega^2 & 1 \\ \omega & 1 & \omega^2 \end{vmatrix}$ is equal to ...
 (a) ω (b) ω^2
 (c) 0 (d) -3
45. If $A = \begin{bmatrix} x & 2 \\ 2 & x \end{bmatrix}$ and $|A^2| = 0$, then x is equal to ...
 (a) ± 2 (b) ± 3
 (c) 1 (d) 4
46. Let $\vec{A} = i - j + k, \vec{C} = -i - j$ be two vectors. Which of the following is the vector \vec{B} such that





- $\vec{A} \times \vec{B} = \vec{C}$ and $\vec{A} \cdot \vec{B} = 1$?
- (a) i (b) k
(c) $-j$ (d) $i + j$
47. A point P on y -axis is equidistance from the points $A(-5,4)$ and $B = (3,-2)$. Its coordinate is
(a) $(0, \frac{3}{4})$ (b) $(0, \frac{4}{3})$
(c) $(0, \frac{3}{7})$ (d) $(0, \frac{7}{3})$
48. The area of the triangle with vertices $A(a, b + c)$, $B(b, c + a)$, $C(c, a + b)$ is equal to ...
(a) 0 (b) $ab + bc + ca$
(c) $a + b + c$ (d) $a + b - c$
49. Two dices are thrown simultaneously. The probability of obtaining a total score of 5 is ...
(a) $\frac{1}{12}$ (b) $\frac{1}{36}$ (c) $\frac{1}{9}$ (d) $\frac{1}{8}$
50. Three of the six vertices of a regular hexagon are chosen at random. The probability that triangle formed with these chosen vertices is equilateral, equal to
(a) $\frac{1}{2}$ (b) $\frac{1}{10}$
(c) $\frac{1}{5}$ (d) $\frac{1}{20}$
51. Minimum number of two-input NAND gates used to perform the function of two-input OR gate is ...
(a) One (b) Two
(c) Three (d) Four
52. The time required for an electronic circuit to change its state is called
(a) propagation Time (b) Rise Time
(c) Decay Time (d) Changing Time
53. Which of the following is not equivalent to x ?
(a) $x \cdot x$ (b) $x + x$
(c) $x.1$ (d) $x + 1$
54. Which of the following is a sequential circuit?
(a) Adder (b) Decoder
(c) Multiplexer (d) Flip Flop
55. Which of the following will be the number of output lines in a combinational circuit that takes input a two bit number and produce the output cube of it?
(a) 3 (b) 4
(c) 5 (d) 6
56. Which of the following is a web browser?
(a) Avira (b) TrustPort
(c) Opera (d) None of these
57. Which of the following is an operating system?
(a) Baidu (b) Symbian
(c) AVG (d) None of these
58. Which of the following is antivirus software?
(a) Symbian (b) Norton
(c) AVG (d) None of these
59. Which of the following is a web search engine?
(a) Opera (b) Symbian
(c) AVG (d) None of these
60. Which of the following is a social media website?
(a) Instagram (b) Norton
(c) Symbian (d) None of these
61. z/OS is a
(a) PC operating system
(b) Mainframe operating system
(c) Mobile operating system
(d) None of these
62. Which of the following is a mobile operating system?
(a) Palm operating system
(b) AVG
(c) BeOS
(d) None of these
63. Intel 8086 is a bit microprocessor.
(a) 4 (b) 8
(c) 16 (d) 32
64. Which of the following is mainframe computer?
(a) Vtech (b) Rabbit
(c) Dubna (d) IBM System/360
65. Wellwer is a
(a) Operating System (b) Microprocessor
(c) Mobile company (d) None of these
66. If $(500)_{10} = (x)_5$, then x is equal to
(a) 400 (b) 4000
(c) 1000 (d) None of these
67. If $(780)_{10} = (1056)_x$, then x is equal to
(a) 7 (b) 5
(c) 8 (d) 9
68. If $(? ? 1)_7 = (120)_{10}$, then the missing digit is
(a) 1 (b) 2
(c) 3 (d) 4
69. The 2's complement of the binary number $(0110100)_2$ is
(a) 1001100 (b) 1101100
(c) 1111100 (d) 1101011
70. The 2's complement 10110010 represent the negative number in 8 bits system
(a) -50 (b) -78
(c) -77 (d) -51
71. Which of the following term is wrong in the series 2, 5, 8, 12, 14, 17, 20, ?
(a) 1st (b) 2nd
(c) 3rd (d) 4th



72. Which of the following term is wrong in the series
1, 4, 9, 16, 21, 36, 49 ?
(a) 6th (b) 5th
(c) 4th (d) 3rd
73. Which of the following term is wrong in the series
1, 3, 6, 11, 15, 21, 28
(a) 1st (b) 2nd
(c) 3rd (d) 4th
74. Which of the following is the next term of the series:
A₁B, B₂D, D₃G, G₄K,?
(a) K₅M (b) K₅P
(c) K₅O (d) K₅Q
75. Which of the following is the next term of the series:
C₁Z, D₃Y, E₅X, F₇W, ... ?
(a) G₈V (b) G₁₀V
(c) G₉W (d) None of these
76. Which of the following is the next term of the series:
ABZ, BDY, DFX, GHW,... ?
(a) KJV (b) KIV
(c) JJV (d) JIV
77. Which of the following is the next term of the series:
CAT, EBS, GCR, IDQ ...?
(a) KFP (b) KEQ
(c) KEP (d) LEP
78. If '234' is coded to '11', then '123' is coded to ...
(a) 6 (b) 5
(c) 7 (d) 8
79. If '123456' is coded to '615', then '214652' is coded to ...
(a) 816 (b) 2134
(c) 613 (d) 713
80. 234:24::235:?
(a) 9 (b) 56
(c) 210 (d) 30
81. 123:9::321:?
(a) 5 (b) 9
(c) 8 (d) 6
82. Which of the following is code for CAT in a coding scheme in which JMI is coded as 32 ?
(a) 21 (b) 24
(c) 23 (d) 22
83. Which of the following is code for JMI in a coding scheme in which BAG is coded as 217 ?
(a) 10139 (b) 9128
(c) 10138 (d) 10129
84. If CAT mean 3, HE mean 2, DELHI mean 5, then SAD is
(a) 1 (b) 2
(c) 3 (d) 4
85. If $54 + 43 = 2,60 + 51 = 10,70 + 61 = 12$, then $72 + 62 = ?$
(a) 14 (b) 13
(c) 8 (d) 9
86. Which of the following is next number in the series
1, 3, 6, 11, 18, 29 ... ?
(a) 39 (b) 40
(c) 41 (d) None of these
87. Which of the following is next number in the series
1, 8, 27, 64, 125, ... ?
(a) 216 (b) 215
(c) 210 (d) None of these
88. Which of the following is next number in the series
3, 7, 13, 21, 31, ... ?
(a) 41 (b) 43
(c) 47 (d) None of these
89. Which of the following is next number in the series
1, 2, 6, 42, ... ?
(a) 57 (b) 1805
(c) 1806 (d) None of these
90. Which of the following term is wrong in the series
1, 1, 2, 4, 5, 8, 13 ?
(a) 2nd (b) 4th
(c) 5th (d) 3rd
91. There are views on the issue of giving bonus to the employees.
(a) independent (b) divergent
(c) modest (d) adverse
92. Before the of the Europeans in India, India was a free country.
(a) entry (b) emigration
(c) advent (d) immigration
93. Which of the following is correctly spelt English word?
(a) Delineate (b) Deleneat
(c) Dileneate (d) Deleneate
94. Which of the following is correctly spelt English word?
(a) Enemyty (b) Enemity
(c) Enmity (d) Enmety
95. Which of the following word is most nearly the same in meaning as the word AMAZING?
(a) Beautiful (b) Good
(c) Astonishing (d) Famous
96. Which of the following word is most nearly the same in meaning as the word BRAVE?
(a) Courageous (b) Serene
(c) Aloof (d) Sob





97. Which of the following word is most nearly the same in meaning as the word DILIGENT?
 (a) Fool (b) Unhappy
 (c) Hardworking (d) Cool
98. Which of the following word is most nearly the opposite in meaning as the word ABSTAIN?
 (a) Refrain (b) Desist
 (c) Hoard (d) Begin
99. Which of the following word is most nearly the opposite in the meaning as the word MITIGATE?
 (a) Aggravate (b) Reduce
 (c) Weaken (d) Ease
100. Which of the following word is most nearly the opposite in the meaning as the word AMBIGUOUS?
 (a) Opaque (b) Clear
 (c) Obscure (d) Vague

$$y = \frac{\pi}{4} + \theta$$

Putting value of θ

$$Y = \frac{\pi}{4} + \tan^{-1}x$$

$$\frac{dy}{dx} = \frac{d}{dx} \left(\frac{\pi}{4} \right) + \frac{d}{dx} (\tan^{-1}x)$$

$$\frac{dy}{dx} = 0 + \frac{1}{1+x^2}$$

$$\frac{dy}{dx} = \frac{1}{1+x^2}$$

Ans. (d) $\frac{1}{1+x^2}$

2. $y = \log (\tan x)$

$$Y = \frac{1}{\tan x} \sec^2 x$$

$$\frac{dy}{dx} = \frac{\sec^2 x}{\tan x}$$

$$= 2 \operatorname{cosec} (2x)$$

Ans. (a)

3. $y = \cos^{-1}x$ and $z = \sin^{-1} \sqrt{1-x^2}$, $\frac{dy}{dz} = ?$

$$\frac{dy}{dz} = -\frac{1}{\sqrt{1-x^2}}, \quad x = \cos \theta \Rightarrow \theta = \cos^{-1}x$$

$$z = \sin^{-1} \sqrt{1-\cos^2 \theta}$$

$$z = \sin^{-1} \sin \theta$$

$$z = \theta \Rightarrow z = \cos^{-1}x$$

$$\frac{dz}{dx} = \frac{-1}{\sqrt{1-x^2}}$$

$$\frac{dy}{dx} \times \frac{dx}{dz} = \frac{-1/\sqrt{1-x^2}}{-1/\sqrt{1-x^2}}$$

$$\frac{dy}{dz} = 1$$

4. $y = e^{2x}$ -----(1)

$$\frac{dy}{dx} = e^{2x}$$

$$\frac{d^2y}{dx^2} = 2e^{2x} \cdot 2$$

$$= 4e^{2x}$$

Diff. eq. (1) w.r.t y

$$\Rightarrow 1 = 2e^{2x} \frac{dx}{dy}$$

$$\frac{dx}{dy} = \frac{1}{2e^{2x}} = \frac{1}{2e^{2x}} = \frac{1}{2y} \quad (\because y = e^{2x})$$

$$\frac{d^2x}{dy^2} = \frac{1}{2} (-1)y^{-2}$$

$$= \frac{-1}{2} (e^{2x})^{-2} \quad (\because y = e^{2x})$$

$$= \frac{-1}{2e^{4x}}$$

$$\text{So } \left(\frac{d^2y}{dx^2} \right) \left(\frac{d^2x}{dy^2} \right) = 4e^{2x} \times \left(\frac{-1}{2e^{4x}} \right)$$

$$= -2e^{-2x}$$

5. $\sqrt{x+y} + \sqrt{y-x} = \sqrt{2}$

$$\sqrt{x+y} = \sqrt{2} - \sqrt{y-x}$$

$$x+y = 2 + (y-x) - 2\sqrt{2}\sqrt{y-x}$$

ANSWER KEY

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
d	a	b	c	a	b	d	c	a	c
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
c	a	d	b	a	b	c	a	d	a
21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
a	a	d	b	c	b	c	b	a	b
31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
a	a	d	b	a	d	a	a	c	b
41.	42.	43.	44.	45.	46.	47.	48.	49.	50.
b	a	d	c	a	b	d	a	c	b
51.	52.	53.	54.	55.	56.	57.	58.	59.	60.
c	a	d	d	c	c	b	b,c	d	a
61.	62.	63.	64.	65.	66.	67.	68.	69.	70.
b	a	c	d	d	b	d	c	a	b
71.	72.	73.	74.	75.	76.	77.	78.	79.	80.
d	b	d	b	d	a	c	b	d	d
81.	82.	83.	84.	85.	86.	87.	88.	89.	90.
a	b	a	c	d	d	a	b	c	b
91.	92.	93.	94.	95.	96.	97.	98.	99.	100.
b	c	a	c	c	a	c	d	a	b

ANSWER:

1. $y = \tan^{-1} \left\{ \frac{1+x}{1-x} \right\}$

Let $x = \tan \theta$

$$\therefore \theta = \tan^{-1} (x)$$

$$y = \tan^{-1} \left(\frac{1+\tan \theta}{1-\tan \theta} \right)$$

$$y = \tan^{-1} \left\{ \tan \left(\frac{\pi}{4} + \theta \right) \right\}$$



$$2x - 2 = -2\sqrt{2}\sqrt{y-x}$$

$$x - 1 = -\sqrt{2}\sqrt{y-x}$$

$$(x-1)^2 = 2(y-x)$$

$$2(x-1) = 2[dy/dx - 1]$$

$$x-1 + 1 = dy/dx$$

$$dy/dx = x$$

$$d^2y/dx^2 = 1 \text{ Answer.}$$

6. $\lim_{n \rightarrow 0} \frac{1 - \cos x}{x^2}$

$$\lim_{n \rightarrow 0} \frac{2 \sin \frac{x}{2}}{\frac{x}{2}}$$

$$2 \lim_{n \rightarrow 0} \frac{\sin \frac{x}{2}}{\frac{x}{2}} \cdot \frac{\sin \frac{x}{2}}{\frac{x}{2}} x$$

$$x \frac{1}{4} \lim_{n \rightarrow 0} \frac{\sin \frac{x}{2}}{\frac{x}{2}} = 1$$

$$2x \frac{1}{4}$$

$$= \frac{1}{2} \text{ Ans. (b)}$$

7. $\lim_{n \rightarrow \infty} (x - \sqrt{x^2 + x})$

$$\lim_{n \rightarrow \infty} \frac{(x - \sqrt{x^2 + x})(x + \sqrt{x^2 + x})}{(x + \sqrt{x^2 + x})}$$

$$\lim_{n \rightarrow \infty} \frac{x^2 - x^2 + x}{(x + \sqrt{x^2 + x})} \Rightarrow \frac{+x}{x(1 + \sqrt{1 + \frac{1}{x}})}$$

limit apply

$$+\frac{1}{2}$$

8. $\int \frac{dx}{(\log x) \cdot x \log(\log x)}$

Put $t = \log(\log x)$

$$= \frac{dt}{dx} = \frac{1}{x \log x}$$

$$= x \log x dt = dx$$

$$\int \frac{dt}{t} = \log|t| + C$$

$$\log|\log(\log x)| + C$$

Ans. (c)

9. $\int x^x (1 + \log x) dx$

Let $x^x = t$

$$d(x^x) = dt$$

$$d(e^{x \log x}) = dt$$

$$e^{x \log x} (\log x + 1) dx = dt$$

$$x^x (1 + \log x) dx = dt$$

$$\text{So } \int x^x (1 + \log x) dx$$

$$\int dt = t + c$$

$$= x^x + C$$

Ans. (a)

10. $\int_0^1 \frac{x}{(1-x)^{3/4}} dx$

$$\int_0^1 \frac{1-x}{[1-(1-x)]^{3/4}} dx$$

$$\int_0^1 \frac{1-x}{x^{-3/4}} dx - \int_0^1 x^{1/4} dx$$

$$= \left[\frac{x^{1/4}}{1/4} \right]_0^1 - \left[\frac{x^{5/4}}{5/4} \right]_0^1$$

$$= 4 - \frac{4}{5} = \frac{16}{5}$$

$$\text{Ans. (c) } \frac{16}{5}$$

11. since A & B are disjoint

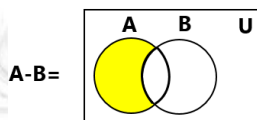
$$(A \cup B) \cap B' = (A \cap B') \cup (B \cap B')$$

$$= A \cup \phi$$

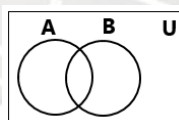
$$= A$$

Ans. (c) A

12.



$$(A-B) - A =$$



Ans. \emptyset

13. let $a = \{a_1, a_2, a_3, \dots, a_{10}\}$

a_1 has 10 choices

a_2 has 9 choices

a_{10} has 2 choices

no. of bichoices

$$= 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$= 10! = 3628800$$

Ans. (d)

14. Let n be a +ve integer

Then n is a k digit no.

$$= 10^{k-1} \leq n < 10^k$$

$$k - 1 \leq \log_{10}(n) < k$$

$$k - 1 = [\log_{10}(n)]$$

$$k = [\log_{10}(n)] + 1$$

Ans. (a)





Q. Corrections \Rightarrow (b) $[\log_{10} n^2] - 1$
(d) $-[\log_{10} n]$

15. $n(A) = 2$
 $n(B) = 5$
no. of relations $= 2^{2 \times 5}$
 $= 2^{10}$
 $= 1024$

Ans. (a)

16. $f: \mathbb{R} \rightarrow \mathbb{R}$ $g: \mathbb{R} \rightarrow \mathbb{R}$
 $f(x) = 2x - 3$, $g(x) = x/2$ $f(g(x))^{-1} = ?$
 $f(g(x)) = x - 3$
 $y = x - 3$
 $x = y + 3$
 $y = x + 3 \Rightarrow f(g(x))^{-1} = x + 3$

17. $f: \mathbb{R} \rightarrow \mathbb{R}$
 $f(x) = x^2 + 5$ $f(4) = ?$
 $y = x^2 + 5$
 $y - 5 = x^2 \Rightarrow x = \sqrt{y - 5} = f^{-1}(x) = \sqrt{x - 5}$
 $f^{-1}(4) = \sqrt{4 - 5} = \sqrt{-1} = \phi$

18. $g: \mathbb{R} \rightarrow \mathbb{R}$ $g(x) = x^2 - 2$ $g^{-1}(23) = ?$
 $y = x^2 - 2 \Rightarrow x^2 = y + 2 = 0$ $x = \sqrt{y + 2}$
 $g^{-1}(x) = \sqrt{x + 2}$
 $g^{-1}(23) = \sqrt{25} \Rightarrow g^{-1}(23) = +5$

19. $|B| = 10$ $|A| = 3$
No. of injective functions
 $\frac{|B|!}{(|B|)! - |A|!}$
 $= \frac{10!}{(10-3)!} = \frac{10!}{7!}$
 $\frac{10 \times 9 \times 8 \times 7!}{7!}$
 $= 720$
Ans. (d)

20. No. of surjection
 $= \sum_{r=1}^n (-1)^{n-r} {}^n C_r r^m$
 $m = 4$ $n = 2$
No. of surjection
 $= \sum_{r=1}^2 (-1)^{2-r} {}^2 C_r (r)^4$
 $= (-1)^{2-1} {}^2 C_1 (1)^4 + (-1)^{2-2} {}^2 C_2 (2)^4$
 $= -2 + 16$
 $= 14$
Ans. (a) 14

21. $z = \sqrt{3} + i$
 $\text{Arg } z = \tan^{-1} \left(\frac{\text{imaginary part of } z}{\text{Real part of } z} \right)$

$$= \tan^{-1} \left(\frac{1}{\sqrt{3}} \right) = \frac{\pi}{6}$$

\bar{z} is conjugate of z

Is $\sqrt{3} - i$

So $\arg \bar{z} = \tan^{-1} \left(\frac{-1}{\sqrt{3}} \right)$

$$= \frac{-\pi}{6}$$

$$|\arg z| + |\arg \bar{z}| = |\pi/6| + |-\pi/6|$$

$$= \frac{\pi}{6} + \frac{\pi}{6}$$

$$= \frac{\pi}{3}$$

Ans. (a)

22. $\frac{(\sqrt{3}+i)^{17}}{(1-i)^{50}}$
 $\Rightarrow \frac{-1-\sqrt{3}i}{2^9}$

23. $\left(\frac{1+i}{1-i} \right)^x = 1$

$$\frac{1+i}{1-i} \times \frac{1+i}{1+i} = \frac{1+i^2+2i}{1-i^2}$$

$$= \frac{1-1+2i}{1+1} = \frac{2i}{2}$$

$$\frac{1+i}{1-i} = i$$

Then

$$\left(\frac{1+i}{1-i} \right)^x = (i)^x = 1$$

$$(i)^x = (i)^4 \text{ or } (i)^8 \text{ or } (i)^{12} \text{ or } (i)^{4n}$$

$$X = 4n \text{ for } n \in \mathbb{I}$$

Ans. (d) 68

24. $(1-w-w^2)(1+w^3)$
Cube root of unity
 $1, w, w^2$
 $1 + w^3 = 1 + 1 = 2$ ($\because w^3 = 1$)
 $1 - w - w^2 = 1 - (w + w^2)$
 $1 - (-1) = 2$
So $(1 - w - w^2)(1 + w^3)$
 $= 2 \cdot 2 = 4$
Ans. (b)

25. $|Z| - Z = 1 + 2i$
 $= \sqrt{x^2 + y^2} - (x + iy)$
 $1 + 2i$ ($z = x + iy$)
 $= \sqrt{x^2 + y^2} - 1 = 1$
 $Y = -2$
Comparing real and imaginary parts
 $X = 3/2$ $y = -2$
Ans. (c) $\frac{3}{2} - 2i$

26. $\sin \theta + \text{cosec } \theta = 2$, $\sin^n \theta + \text{cosec}^n \theta = ?$
 $(\sin \theta + \text{cosec } \theta)^2 = 4$





$$\begin{aligned} \sin^2\theta + \operatorname{cosec}^2\theta + 2 \sin \theta \operatorname{cosec} \theta &= 4 \\ \sin^2\theta + \operatorname{cosec}^2\theta &= 2 \\ (\sin \theta + \operatorname{cosec} \theta)^2 &= 8 \\ \sin^3\theta + \operatorname{cosec}^3\theta + 3 \sin \theta \operatorname{cosec} \theta (\sin \theta + \operatorname{cosec} \theta) &= 8 \\ \sin^3\theta + \operatorname{cosec}^3\theta + 3 \times 2 &= 8 \\ \sin^3\theta + \operatorname{cosec}^3\theta &= 2 \\ \sin^n\theta + \operatorname{cosec}^n\theta &= 2 \text{ Ans.} \end{aligned}$$

27. $\sin^6x + \cos^6x + 3 \sin^2x \cos^2x = ?$

$$\begin{aligned} (\sin^2x)^3 + (\cos^2x)^3 + 3 \sin^2x \cos^2x \\ (\sin^2x + \cos^2x)^3 - 3 \sin^2x \cos^2x (\sin^2x + \cos^2x) + 3 \\ \sin^2x \cos^2x \\ \sin^2x + \cos^2x &= 1 \\ 1^3 - 3 \sin^2x \cos^2x + 3 \sin^2x \cos^2x \\ &= 1 \text{ Ans.} \end{aligned}$$

28. $x = a \cos^2 \sin\theta, \quad y = a \sin^2\theta \cos\theta \quad (x^2+y^2)^3 = ?$

$$\begin{aligned} x^2 &= a^2 \cos^4 \theta \sin^2\theta, y^2 = a^2 \sin^4\theta \cos^2\theta \\ (x^2 + y^2) &= a^2 \cos^4\theta \sin^2\theta + a^2 \sin^4\theta \cos^2\theta \\ (x^2 + y^2) &= a^2 \cos^2\theta \sin^2\theta (\sin^2\theta + \cos^2\theta) \\ (x^2 + y^2) &= a^2 \cos^2\theta \sin^2\theta \\ (x^2 + y^2)^3 &= a^6 \cos^6\theta \sin^6\theta \\ (x^2 + y^2)^3 &= a^2 (a^2 \cos^4\theta \sin^2\theta \cdot a^2 \sin^4\theta \cos^2\theta) \\ (x^2 + y^2)^3 &= a^2 x^2 y^2 \end{aligned}$$

29. $3 \cos \theta + 4 \sin \theta + 10$

$$\begin{aligned} \min &= -\sqrt{a^2 + b^2} + c \\ &= -\sqrt{9 + 16} + 10 \\ &= -5 + 10 \\ &= 5 \text{ min value.} \end{aligned}$$

30. $\sin 6^\circ \sin 42^\circ \sin 66^\circ \sin 78^\circ$

$$\begin{aligned} &= \frac{1}{4} [(\cos 60^\circ - \cos 72^\circ)(\cos 36^\circ - \cos 120^\circ)] \\ &= \frac{1}{4} \left[\left(\frac{1}{2} - \frac{\sqrt{5}-1}{4} \right) \left(\frac{\sqrt{5}+1}{4} - \frac{1}{2} \right) \right] \\ \text{For } \frac{x^2}{9} + \frac{y^2}{4} &= 1 \\ \frac{1}{9} + \frac{2^2}{4} - 1 &> 0 \\ \text{And } \frac{2^2}{9} + \frac{1}{4} - 1 &< 0 \\ &= P \text{ lies outside E and Q Inside E} \\ \text{Ans. (d)} \end{aligned}$$

31. (c)

$$\begin{aligned} 20^{\text{th}} \text{ term} &= 30 \\ 30^{\text{th}} \text{ term} &= 20 \\ a_{20} &= a + 19d = 30 \dots\dots\dots(1) \\ a_{30} &= a + 29d = 20 \dots\dots\dots(2) \end{aligned}$$

$$\begin{aligned} \text{subtract (i) from (2)} \\ (a+29d) - (a+19d) &= 20-30 \\ 10d &= -10 \\ d &= -1 \\ \text{so } a + 19(-1) &= 30 \\ a &= 30 + 19 \\ &= 49 \\ \text{So } 10^{\text{th}} \text{ term} &= a + 9d \\ &= 49 + 9(-1) \end{aligned}$$

32. $S_n = 2n(n-1)$

$$\begin{aligned} n &= 1 \\ S_1 &= 0 = a_1 \\ a_1 &= 0 \\ n &= 2 \\ S_2 &= 4(1) = 4 = a_1 + a_2 \\ a_2 &= 4 \\ n &= 3 \\ S_3 &= 6 \times 2 = 12 = a_1 + a_2 + a_3 \\ a_3 &= 8 \\ n &= 3 \\ S_4 &= 8 \times 3 = 24 = a_1 + a_2 + a_3 + a_4 \\ a_4 &= 12 \\ (a_1, a_2, a_3, a_4, \dots, a_n) \\ (0, 4, 8, 12, 16, \dots, n) \\ 4(0, 1, 2, 3, 4, \dots, n) \\ (4)^2 (0+1^2+2^2+3^2+4^2+\dots+n^2) \\ \frac{4^2 [n(n+1)(2n+1)]}{6} \\ \frac{8[n(n+1)(2n+1)]}{3} \text{ Answer.} \end{aligned}$$

33. Let sum of 1st m terms = 5m & sum of 1st n terms = Sn

$$\begin{aligned} \text{So } \frac{5m}{5n} &= \frac{m^2}{n^2} \\ &= \frac{m}{2} \frac{[2a+(m-1)d]}{[2a+(n-1)d]} = \frac{m^2}{n^2} \\ \frac{2a+(m-1)d}{2a+(n-1)d} &= \frac{m}{n} \\ n[2a+(m-1)d] &= m[2a+(n-1)d] \\ 2an+mnd-nd+2am+mnd-nd \\ md-nd &= 2am-2an \\ d &= 2a \\ \text{So Ratio of } m^{\text{th}} \text{ and } n^{\text{th}} \text{ term} \\ \frac{am}{an} &= \frac{a+(m-1)d}{a+(n-1)d} \\ &= \frac{a+(m-1)2a}{a+(n-1)2a} \\ &= \frac{a(1+2m-2)}{a(1+2n-2)} \\ &= \frac{2m-1}{2n-1} \\ \text{Ans. (c)} \end{aligned}$$



34. $9^{1/3} \times 9^{1/9} \times 9^{1/27} \times \dots \dots \dots \infty$
 $9\left(\frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots \dots \dots \infty\right) = 9^{\frac{a}{(1-r)}}$

$a = 1/3 \quad r = 1/3$
 $\frac{(1/3)}{9(1-1/3)} = 9^{1/2} = 3$

Ans. (c)

35. α, β roots of equation
 $x^2 + px + p^2 + q = 0$
 equation formed by 2 roots
 $x^2 - (\alpha + \beta)x + \alpha\beta = 0$

So $\alpha + \beta = -P$
 $\alpha\beta = P^2 + q$
 So $(\alpha^2 + \beta^2) + \alpha\beta$
 $(\alpha^2 + \beta^2) + \alpha\beta$
 $\alpha^2 + \beta^2 - 2\alpha\beta + \alpha\beta$

$(\alpha + \beta)^2 - \alpha\beta$
 $(-P)^2 - (P^2 + q)$
 $P^2 - P^2 - q$

$= -q$

37. $x^2 - bx + c = 0, \quad b^2 - 4c = ?$
 root are consecutive number

$P + (P + 1) = b \quad = \quad 2P + 1 = b$
 $P(P + 1) = C \quad = \quad P^2 + P = C$
 $(2P + 1)^2 - 4(P^2 + P)$
 $4P^2 + 4P + 1 - 4P^2 - 4P$
 $= 1$

38. $(x-1)^2 + (x-2)^2 + (x-3) = 0$
 $x^2 + 1 - 2x + x^2 + 4 - 4x + x^2 + 9 - 6x = 0$
 $3x^2 - 12x + 14 = 0$

$D = b^2 - 4ac$
 $= (-12)^2 - 4(3)(14)$
 $= 144 - 168$
 $= -24 < 0$

$\therefore D < 0$ No real roots of the equation.

Ans. (a)

39. $(b-c)x^2 + (c-a)x + (a-b) = 0$
 General equation

$Ax^2 + Bx + C = 0$
 $D = B^2 - 4AC = 0$

So $(c-a)^2 = 4(a-b)(b-c)$
 $c^2 + a^2 - 2ac = 4\{ab - ac - b^2 + bc\}$
 $c^2 + a^2 - 2ac = 4ab - 4ac - 4b^2 + 4bc$
 $a^2 + 4b^2 + c^2 + 2ac - 4ab - 4bc = 0$
 $(a - 2b - c)^2 = 0$

$a - 2b + c = 0$

$a + c = 2b$

$b = \frac{a+c}{2}$

So a, b & c are in AP.

Ans. (c)

40. $x^2 + 2x + 3\lambda = 0$

$2x^2 + 3x + 5\lambda = 0$

Condition for common root

$\frac{x^2}{10\lambda - 9\lambda} = \frac{x}{5\lambda - 6\lambda} = \frac{1}{3-4}$

$(6\lambda - 5\lambda)^2 = (3-4)(10\lambda - 9\lambda)$

$\lambda = -1$

Ans. (b) -1

41. ${}^n P_r = {}^n P_{r+1}$

$\frac{n!}{r!(n-r)!} = \frac{n!}{(r-1)!(n-r+1)!}$

$\frac{r}{n-r+1} = 1$

$n = 2r - 1$

from equation (1)

$n = r + 1$

$= r + 1 = 2r - 1$

$r = 2$

$n = r + 1 = 3$

So $r = 2, n = 3$

Ans. (b) (3, 2)

42. Total no. of ways

$= \frac{6!}{2!3!} = 60$

No. of words in which 2N's come together is

$\frac{5!}{3!} = 20$

So Required no is $60 - 20 = 40$

Ans. (a)

43. $(1-x)^n = C_0 - C_1 x + C_2 x^2 - C_3 x^3 + n$ terms

So $x(1-x)^n = C_0 x - C_1 x^2 + C_2 x^3 - C_2 x^4 + \dots$

$\int_0^1 x(1-x)^n dx$

$= \int_0^1 (C_0 x - c_1 x^2 + c_2 x^3 - c_3 x^4 + \dots) dx$

$= -\int_0^1 (1-t)^n t dt$

$= \left[\left(C_0 \frac{x^2}{2} - C_1 \frac{x^3}{3} + C_2 \frac{x^4}{4} - C_3 \frac{x^5}{5} + \dots \right) \right]_0^1$

Where $r = 1 - x$

$= \left[\left(\frac{r^{n+1}}{n+1} - \frac{r^{1+2}}{n+2} \right) \right]_1^0$

$= \frac{C_0}{2} - \frac{C_1}{3} + \frac{C_2}{4} - \frac{C_3}{5} + \dots - \frac{1}{n+2} - \frac{1}{n+2}$



$$= \frac{1}{(n+1)(n+2)}$$

Ans. (d)

44.
$$\begin{bmatrix} 1 & w & w^2 \\ 1 & w^2 & 1 \\ w & 1 & w \end{bmatrix} w^3 = 1$$

$$1 + w + w^2 - (w^2 + 1 + w^2) = 0$$

45.
$$A = \begin{bmatrix} x & 2 \\ 2 & x \end{bmatrix}$$

$$A^2 = A.A.$$

$$A^2 = \begin{bmatrix} x \cdot 2 + 2 \cdot 2 & x \cdot 2 + 2 \cdot x \\ 2 \cdot x + x \cdot 2 & 2 \cdot 2 + x \cdot x \end{bmatrix}$$

$$\begin{bmatrix} x^2 + 4 & 2x + 2x \\ 2x + x \cdot 2 & 4 + x^2 \end{bmatrix}$$

$$\begin{bmatrix} x^2 + 4 & 4x \\ 4x & x^2 + 4 \end{bmatrix}$$

$$|A^2| = (x^2+4)^2 - (4x)^2$$

$$= (x^2 + 4)^2 - 16x^2$$

$$= x^4 + 8x^2 + 16 - 16x^2$$

$$= x^4 - 8x^2 + 16$$

Given $|A|^2 = 0$

$$x^4 - 8x^2 + 16 = 0$$

let $y = x^2$

$$y^2 - 8y + 16 = 0$$

$$y = \frac{8 \pm \sqrt{64-64}}{2}$$

$$y = \frac{8}{2}$$

$$y = 4$$

So $x = \pm 2$

Ans. (a) ± 2

46.
$$\vec{A} = i - \hat{j} + \hat{k}$$

$$\vec{C} = -\hat{i} - \hat{k}$$

$$\vec{A} \times \vec{B} = \vec{C}$$

Let $\vec{B} = b_1\hat{i} + b_2\hat{j} + b_3\hat{k}$

$$\vec{A} \cdot \vec{B} = 1$$

$$b_1 - b_2 + b_3 = 1 \quad \dots\dots(1)$$

$$\vec{A} \times \vec{B} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & -1 & 1 \\ b_1 & b_2 & b_3 \end{vmatrix}$$

$$-\hat{i} - \hat{j} = \hat{i} (-b_3 - b_2) - \hat{j} (b_3 - b_1) + \hat{k} (b_2 + b_1)$$

$$-\hat{i} - \hat{j} = -\hat{i} (b_3 + b_2) - \hat{j} (b_3 - b_1) + \hat{k} (b_2 + b_1)$$

$$b_3 + b_2 = 1 \quad \dots\dots(2)$$

$$b_3 - b_1 = 1 \quad \dots\dots(3)$$

$$b_2 + b_1 = 0$$

$$b_2 = -b_1$$

$$b_3 = 1 + b_1$$

Put the value b_2 and b_3 equation (1)

$$b_1 + b_1 + 1 + b_1 = 1$$

$$3b_1 = 0$$

$$b_1 = 0$$

$$b_3 = 1$$

$$b_2 = 0$$

$$\vec{B} = \hat{k} \text{ Answer.}$$

47. $P(0, K) ; A(-5, 4) ; B(3, -2)$

$$PA = PB$$

$$PA^2 = PB^2$$

$$25 + (k-4)^2 = 3^2 + (k+2)^2$$

$$25 + 16 + k^2 - 8k = 9 + 4 + k^2 + 4k$$

$$28 = 12k$$

$$K = \frac{28}{12} = \frac{7}{3}$$

$$P\left(0, \frac{7}{3}\right)$$

Ans. (d)

48. $A = (x_1y_1)$

$$B = (x_2, y_2)$$

$$C = (x_3, y_3)$$

$$\text{Area} = \frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$

So Area = $\frac{1}{2}[a(a + b - (c + a)) + b(b + c - (a + b)) + c(c + a - (b + c))]$

$$\text{Area} = \frac{1}{2}[ab - ac + bc - ba + ca - cb]$$

$$\text{Area} = 0$$

Ans.

49. Let E be the event of getting the sum of 5 $E = (1, 4), (4, 1), (2, 3), (3, 2)$

So $n(E) = 4$

Also $n(S) = 6 \times 6 = 36$

Probability of event E

$$P(E) = \frac{n(E)}{n(S)} = \frac{4}{36} = \frac{1}{9}$$

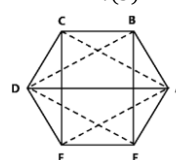
Ans. (c)

50. Let T represent the equilateral triangle $n(T) =$ No. of equilateral triangle with six vertices ABCDEF of regular hexagon are only 2.

Namely Triangle ACE, Triangle BDF

Ans. $n(S) =$ Total no. of Δ with 6 vertices are ${}^6C_3 = 20$

$$P(T) = \frac{n(T)}{n(S)} = \frac{2}{20} = \frac{1}{10}$$





Ans. (b)

51. (a)
52. (a)
53.
54. (d)
55. for input 00 (decimal 0) : $0^3 = 0$
For input 01 (decimal 1) : $1^3 = 1$
For input 10 (decimal 2) : $2^3 = 8$
For input 11 (decimal 3) : $3^3 = 27$
Ans. (b)

56.	(c)	57.	(b)	58.	(c)	59.	(d)
60.	(a)	61.	(b)	62.	(a)	63.	(c)
64.	(d)	65.	(d)				

66. $(500)_{10} = (x)_5$
(1) $500 \div 5 = 100$ remainder 0
(2) $100 \div 5 = 20$ remainder 0
(3) $20 \div 5 = 4$ remainder 0
(4) $4 \div 5 = 0$ remainder 4
So $500_{10} = 4000_5$
X in base 5 is 4000
Ans. (b)
67. $(780)_{10} = (1056)_x$
 $(1056)_x = 1 \cdot X^3 + 0 \cdot X^2 + 5 \cdot X + 6$
 $= X^3 + 5X + 6$
 $\therefore (1056)_x = (780)_{10}$
So $X^3 + 5X + 6 = 780$
 $X^3 + 5X - 774 = 0$
For $x = 8$
 $8^3 + 5 \cdot 8 - 774$
 $512 + 40 - 774 = -222$ (not zero)
For $x = 9$
 $9^3 + 5 \cdot 9 - 774$
 $= 729 + 45 - 774 = 0$
 $x = 9$

68. $(2x_1)_7 = (120)_{10}$
So $(2x_1)_7 = 2 \cdot x \cdot 7^2 + x \cdot 7^1 + 1 \cdot 7^0$
 $= 98 + 7x + 1$
 $\therefore (2x_1)_7 = (120)_{10}$
So $98 + 7x + 1 = 120$
 $7x = 21$
 $x = 3$
Ans. (c)

69. Given no. $(0110100)_2$
2's compliment
 $= 1$'s complement + 1

1's complement of 0110100
 $= 1001011$

2's complement = $1001011 + 1$
 $= 1001100$

Ans. (a)

70. 10110010 no. is negative
MSB is 1 no. is negative
2's comp = $01001101 + 1$
 $= 01001110$
 $(01001110)_2 = 78$
So negative value = -78
Ans. (b)

71. No. option.

72. $1^2 = 1$
 $2^2 = 4$
 $3^2 = 9$
 $4^2 = 16$
 $5^2 = 25$ (Not include in series)
 $6^2 = 36$
 $7^2 = 49$
Ans. (b)

73. 1, 3, 6, 11, 15, 21, 28
- | | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 3 | 6 | 11 | 15 | 21 | 28 |
| +2 | +3 | +4 | +5 | +6 | +7 | |
- 10

11 wrong number.

74. $A_1B, B_2D, D_3G, G_4K, \dots$?

+1	+2	+3	+4
A_1B	B_2D	D_3G	G_4K
+2	+3	+4	+5

Ans. K_5P

76. ABZ, BDY, DFX, GHW, ...?

-1	-1	-1	-1
ABZ	BDY	DFX	GHW
+1	+2	+3	+4
+2	+2	+2	+2

Ans. KJV

77. CAT, EBS, GCR, IDQ, ...?

+2	+2	+2	+2
CAT	EBS	GCR	IDQ
+1	+1	+1	+1
-1	-1	-1	-1

Ans. KEP.

78. 234 \rightarrow 11
123 \rightarrow ?





$$4 \times 2 + 3 = 11$$

$$1 \times 3 + 2 = 5 \text{ Ans.}$$

79. 123456 \rightarrow 615
 214652 \rightarrow ?
 $1 + 2 + 3 = 6, \quad 4 + 5 + 6 = 15$
 $2 + 1 + 4 = 7, \quad 6 + 5 + 2 = 13$
 214652 = 713

80. 234 : 24 :: 235 : ?
 $2 \times 3 \times 4 = 24$
 $2 \times 3 \times 5 = 30$

81. 123 : 9 :: 321 : ?
 $(1 \times 2) \times 3 = 9$
 $(3 + 2) \times 1 = 5$

82. JMI \rightarrow 32
 CAT \rightarrow ?
 $J = 10 \quad J + M + I = 32$
 $M = 13 \quad 10 + 13 + 9 = 32$
 $I = 9$
 $C = 3 \quad C + A + T = 24$
 $A = 1 \quad 3 + 1 + 20 = 24$
 $T = 20$
 CAT \rightarrow 24 Ans.

83. BAG \rightarrow 217
 JMI \rightarrow ?
 $B = 2 \quad BAJ = 217$
 $A = 1$
 $G = 7$
 $J = 10 \quad JMI = 10139$
 $M = 13$
 $I = 9$

84. CAT = 3
 HE = 2 No. of Alphabet
 DELHI = 5
 SAD = 3
 Ans. 3

85. $54 + 43 = 2 \Rightarrow 5 - 4 + 4 - 3 = 2$
 $60 + 21 = 10 \Rightarrow 6 - 0 + 5 - 1 = 10$
 $70 + 61 = 12 \Rightarrow 7 - 0 + 6 - 1 = 12$
 $72 + 62 = ? \Rightarrow 7 - 2 + 6 - 2 = 9$

86. 1, 3, 6, 11, 18, 29 ?

1	3	6	11	18	29	42
+2	+3	+5	+7	+11	+13	

 Ans. 42

87. 1, 8, 27, 64, 125,?

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

Ans. 216

88. 3, 7, 13, 21, 31, ?

3	7	13	21	31	43
+4	+6	+8	+10	+12	

 Ans. 43

89. 1, 2, 6, 42, ?

1	2	6	42	1806
1^{2+1}	2^{2+2}	6^{2+6}	42^{2+42}	

 Ans. 1806

91.	(b)	92.	(c)	93.	(a)	94.	(c)
95.	(c)	96.	(a)	97.	(c)	98.	(d)
99.	(a)	100.	(b)				