ICET - 2003 PAPER

BASED ON STUDENTS MEMORY

1. 2, 17, 82, 257, ..., 1297.
2. 1, 1, 2, 8, ..., 27, 4, 64.
3. 101, 101001, 1010010001, ...
4. $\frac{2}{19}, \frac{4}{17}, \frac{16}{15}, \ldots\ldots, \frac{65536}{11}$
5. AEIM, BFJN, CGKO, ...
6. ZIA, Y4C, ..., W16G, V 25 I
7. $36 + \sqrt{2}, 25 + \sqrt{3}, 16 + \sqrt{5}, \ldots\ldots, 4 + \sqrt{11}$
8. ABDH, DEGK, GHJN, ..., MNPT
9. **5 : 36 : : 8 : .....** ( )
   1) 39 2) 69 3) 81 4) 71
10. **343 : 512 :: 1000 : .....** ( )
    1) 1050 2) 1132 3) 1241 4) 1331

Find the ODDMAN OUT :

11. 25, 27, 32, 34
12. 87, 77, 67, 57
13. 23, 33, 43, 53
14. 124, 142, 241, 214
15. TG, VE, XB, ZA
16. PRK, IRK, EST, ALN
17. AKU, CMW, ENX, DNX

DIRECTIONS FOR Q.No : (18 to 22) Read the following table and answer the questions given below:

The number of scooters and mopeds produced (in thousands)

	1995	1996	1997	1998	1999	2000	2001
Scooters	185	242	169	126	96	148	176
Mopeds	146	182	254	188	112	162	242

18. **What is the percentage increase in scooters from 1999 to 2001 ?** ( )
    1) 80% 2) 83% 3) 85% 4) 86%
19. **The ratio between the number of Scooters and Mopeds is maximum in :** ( )
    1) 1996 2) 1995 3) 1998 4) 1997
20. **The total production is minimum in which year?** ( )
    1) 1995 2) 1998 3) 1999 4) 1997
21. **The value of a Scooter is Rs. 40,000 and that of a Moped is Rs. 20,000 in 2001. What is the ratio between the total values of Scooters and Mopeds in that year ?** ( )
    1) 16 : 11 2) 15 : 11 3) 16 : 9 4) 15 : 8
22. **The production of Mopeds is close to 50% of production of Scooters in 2000 and 2001 in.....** ( )
    1) 1995 2) 2000 3) 1998 4) 2001

DIRECTIONS FOR Q.No : (23 to 27) The following Pie-diagram gives the position of employment in a city in 2000.

23. **The ratio of number of professionals to teachers is :** ( )
    1) 2 :3 2) 1 : 3 3) 3 : 2 4) 3 : 1
24. **The Percentage of Un-employed in the city is.....** ( )
    1) 43 1/4% 2) 23 1/3% 3) 30% 4) 33 1/3%
25. **If the number of professionals is 27,000, what is the total number of persons in the city ?** ( )
    1) 3,24,000 2) 2,34,000
    3) 4,23,000 4) 3,42,000
26. **If the average income of teachers is 50% of that of professional employees and the total income of professional employees is Rs. 2376 thousands. What is the total income of the teachers (in thousands) ?** ( )
    1) 1188 2) 792 3) 1088 4) 732
27. **If 1980 are labours, how many are Un-employed ?** ( )
    1) 2540 2) 2680 3) 2640 4) 2460
28. **A man travelled 1200 km by air, which formed $\frac{2}{5}$ of histrip. He travelled remaining distance by car and train. If the distance travelled by car is one-third of the total, howmany km did he travel by train ?** ( )
    1) 700 2) 800 3) 900 4) 1200
29. **"I am 8 times as old as you were when I was as old as you are", said a man to his son. What are the ages of Father and the son ? (in years)** ( )
    1) 47, 28 2) 49, 26 3) 48, 27 4) 52, 23
30. **A is the Father of B and C. E is the mother of C and D is the wife of F. F is the brother of E. How is D related to B ?**
    1) Maternal Aunt 2) Paternal aunt
    3) Maternal grand mother
    4) Paternal grand mother

31. If $a \times b = (a - b)^2 + 2$ then $3 \times (2 \times 1) = ?$ ( )
1) 3 2) 2 3) 1 4) 0

32. If $a \times b = (a + b - 3)^2 + 1$ then $(1 \times 2) \times (3 \times 4) = ?$
1) 226 2) 225 3) 197 4) 196 ( )

33. If $x = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, $y = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ then $x^2 + xy + y^2 = ?$

34. $\frac{1}{\sqrt{2} + \sqrt{3} - \sqrt{5}} + \frac{1}{\sqrt{2} - \sqrt{3} - \sqrt{5}} = ?$

35. If $x = 7 - 4\sqrt{3}$ then $x + \frac{1}{x} = ?$

36. $(1+x^2+x^4)^{-1} + (1 + x^2 + x^{-2})^{-1} + (1 + x^{-4} + x^{-2})^{-1} = ?$
1) 1 2) 0 3) x^{24} 4) $x^6 + x^8 + x^{10}$

37. If $ab = cd$, $a^x = b^y = c^z = d^w$ then $\frac{1}{x} + \frac{1}{y} = ?$

38. If $8^{2x-4} = 16^{x-2}$ then $x = ?$

39. If $x^2 + 8y^2 + 9z^2 = 4y(x + 3z)$ then $x : y : z = ?$

40. The radii of two cones are in the ratio 1 : 2 and their volumes are in the ratio 4 : 5. What is the ratio of their heights ? ( )
1) 4 : 5 2) 16 : 5 3) 4 : 25 4) 5 : 4

41. Three numbers are in the ratio 2 : 3 : 4 and their L.C.M is 360. What is the sum of these three numbers ? ( )
1) 240 2) 270 3) 300 4) 360

42. If the number '106240247 a' is divisible by 9, what is the value of 'a' ? ( )
1) 4 2) 3 3) 2 4) 1

43. If A = {P ∈ N : p a prime and $p = \frac{4x^2 + 5n + 10}{n}$ for some n ∈ N} then n(A) = ? ( )
1) 1 2) 2 3) 3 4) 4

44. A = {3, 7, 12, 15, 19, ... 43} and B = {x ∈ A : x is a perfect square} then A – B = ? ( )
1) A 2) {0} 3) B – A 4) B

45. The L.C.M and G.C.D. of two numbers are 504 and 12 respectively. If one number is 72, what is the other number ? ( )
1) 60 2) 64 3) 84 4) 108

46. If (x, y) is a solution of $x^2 + y^2 - 30x - 20y + 325 = 0$ then G.C.D. of x, y is ( )
1) 5 2) 40 3) 30 4) 60

47. If a and b are irrational, then the product ab is .....

48. The number of distinct solution in R of the equation $|x - |2x + 1|| = 3$ is ( )
1) 0 2) 1 3) 2 4) 4

49. If 20% of a number 'x' is 25 more than 10% of 1200, then x = ? ( )
1) 725 2) 500 3) 525 4) 550

50. If 25% of 280 = 7% of x, then what is the value of 'x' ? ( )
1) 1000 2) 100 3) 500 4) 175

51. The values of x that do not satisfy $\frac{x + 1}{x - 2} \geq 0$ are such that :

52. Which of the following statements is a contradiction ? ( )
1) $(\sim q) \wedge p$ 2) $p \wedge (\sim p)$
3) $(p \vee q) \vee (\sim p)$ 4) $p \Rightarrow q$

53. If $f(x) = x^2 + 1$, $g(x) = x + 2$, $x \in R$ then $f(g(x)) = ?$

54. If $f(x) = |x + 1| + |x - 1|$, $x \in R$ then the number of solutions of $f(x) = 0$ is

55. The roots of $(b - c)x^2 + b(c - a)x + c(a - b) = 0$ are equal then :

56. If $x \in R$, $x^2 + 10x - 24 < 0$ then ( )
1) $-12 < x < 2$ 2) $-2 < x < 12$
3) $2 < x < 12$ 4) $x > 12$

57. If $(x - 1)$ is a factor of $f(x)$ then which of the following is a factor of $f(x^2 - 3)$? ( )
1) $x - 1$ 2) $x - 2$ 3) $x - 3$ 4) $x - 4$

58. If $t_8 = 17$, $t_{19} = 39$, $t_{25} = ?$ in A.P.

59. If $a, a_2, \ldots\ldots, a_{10}$ are the Arithmetic means between two numbers 3 and 47 then $a_5 = ?$

60. The number of solutions of $2x + 3y = 5$ and $4x + 6y = 12$

61. If $\begin{pmatrix} 3 & -2 \\ -1 & 2 \end{pmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{pmatrix} 11 \\ -5 \end{pmatrix}$ then $3x + 2y = ?$

62. If $A = \begin{pmatrix} 1 & 8 \\ 0 & 1 \end{pmatrix}$ then $A^8 = ?$

63. If $A = \begin{bmatrix} 2 & 5 \\ 5 & 2 \end{bmatrix}$ then $A^3 - 4A^2 = ?$

64. $(\sqrt{3} - 1)^6 + (\sqrt{3} + 1)^6 = ?$

65. $\lim_{x \to -2} \frac{x^5 + 32}{x + 2}$

66. If $V = \frac{4}{3}\pi r^3$ then $\frac{dv}{dr}$ at $r = 1$ is .....

67. A Shop-keeper sold a watch for Rs. 630, after giving a discount of 10% on its marked price. If he had not allowed any discount, the profit would be 25%. What is the cost price of the watch ? ( )
1) Rs. 560 2) Rs. 567 3) Rs. 600 4) Rs. 605

68. The marketing price of an article is 30% above the cost price. After allowing a certain discount, a profit of 17% is obtained on it. What is the discount percentage ? ( )
1) 13% 2) 10% 3) 5% 4) 7.5%

69. A rectangle of length 12 cm and breadth 5 cm is inscribed in a circle. What is its radius?( )
1) 6 cm 2) 6.5 cm 3) 7 cm 4) 8.5 cm

70. A wire in the form of a circle with diameter 42 cm is bent in the form of a rectangle whose sides are in the ratio 6 : 5. What is the breadth of the rectangle thus formed ? ( )
1) 60 cm 2) 65 cm 3) 30 cm 4) 75 cm

71. Howmany three - digited natural numbers are there which leaves 14 as remainder, when divided by 15 ? ( )
1) 64 2) 66 3) 68 4) 60

72. The number of three - digited numbers when divided by 11 leaves 10 as remainder is ( )
1) 81 2) 80 3) 82 4) 83

73. A sphere made of copper of radius 3 cm its melted into a wire of diameter 0.2 cm. What is the length of the wire (in mt) ? ( )
1) 36 2) 34 3) 28 4) 24

74. The diameter of a wheel is 1.26m. How many metres will it cover in 500 rotations ? ( )
1) 2640 2) 1980 3) 2060 4) 1680

75. The volumes of two cones of equal height are in the ratio 1849 : 961. What is the ratio of their radii ? ( )
1) 43 : 31 2) 43 : 29 3) 39 : 31 4) 41 : 31

76. A sum becomes double in 8 years at simple interest. What is the rate percent per annum ?
1) 12% 2) 8% 3) 12.5% 4) 7.5%( )

77. What is the principal amount which earns Rs. 252 as compound interest for the second year at 10% pa is (in Rupees) ? ( )
1) 1350 2) 1300 3) 1200 4) 1100

78. 'A' can do a work in 30 days and B alone can do it in 20 days. A started the work and after 5 days B joins him. What is the total number of days taken to complete the work ? ( )
1) 10 2) 12 3) 15 4) 16

79. $[1 - \{1 - (1 - x^3)^{-1}\}^{-1}]^{-1/3} = ?$

80. A and B started a business. A's investment is thrice that of B and period of his investment is twice that of B. If B received Rs. 4,000 as his share in the profit, what is the total profit ?
1) Rs. 20,000 2) Rs. 28,000 ( )
3) Rs. 24,000 4) Rs. 32,000

81. A train running at 36 mps passes a man walking in opposite direction at 4 mps in 10 sec. What is its length ? ( )
1) 400m 2) 480m 3) 360m 4) 460m

82. 36 kmph = ... m/g ? ( )
1) 40 2) 12.5 3) 10 4) 20

83. If $\angle A = 30°$, $\angle B = 60°$, $\angle C = 90°$ then the ratio of sides opposite to $\angle A$, $\angle B$, $\angle C$.

84. If the straight line $y = mx + c$ passes through (0, 2) and (1, 0) then the order pair (c, m) = ?

85. If $\cos\theta + \sec\theta = 2$ then $\cos^4\theta + \sec^4\theta = ?$

86. If $a = x\sin\theta + y\cos\theta$; $b = y\sin\theta - x\cos\theta$, then $y^2 - a^2 = ?$

87. $\sin x \cos 60° + \cos x \sin 60° = 1$ then x = ?

(Remaining Bits Not available)

KEY WITH SOLUTIONS

1. 2 17 82 257 – 1297
Sol. 1^2+1 4^2+1 9^2+1 16^2+1 25^2+1 36^2+1
Ans : 626

2-3 1 1 2 8 – 27 4 64
Series follows alternate pattern
Ans : 3

3. Ans : 101001000100001

4-4 Numerator increases by previous number square & denominator decreases by 2

$\frac{2}{19}$ $\frac{2^2}{17}$ $\frac{4^2}{15}$ $\frac{16^2}{13}$ $\frac{256^2}{11}$

Ans : $\frac{256}{13}$

5. AEIM, BFJN, CGKO DHLP

6. 21A, Y4C X9E W16G V25I

7. $36+\sqrt{2}$, $25+\sqrt{3}$ $16+\sqrt{5}$ $9+\sqrt{7}$ $4+\sqrt{11}$

8. ABDH, DEGK GHJN JKMQ MNPT

9-3 5 : 36 : : 8 : 81

10-4 343 : 512 :: 1000 : 1331

Sol. $7^3 : 8^3 :: 10^3 : 11^3$

11. 25, 27, 32, 34 Ans 27 except 27 all others sum is

12. 87, 77, 67, 57 Ans 67 57 is the only prime No.

13. 23, 33, 43, 53 Ans 33 33 is the only composite No.

14. Ans 241 241 is prime No.

15. Ans XB XB is not compliment pair.

16. Ans PRK All except PRK has vowel.

17. Ans DNX every letter in other terms is increasing by 10