ICET - 2007 PAPER
(BASED ON STUDENTS MEMORY)

Time : 2 Hours]   [Max. Marks : 200

SECTION - A
ANALYTICAL ABILITY

Questions : 75]   [Marks : 75

I) DATA SUFFICIENCY

Note : In questions numbered 1 to 20, a question is followed by data in the form of two statements labelled as I and II. You must decide whether the data given in the statements are sufficient to answer the questions. Using the data make an appropriate choice from (1) to (4) as per the following guidelines :

  a) Mark choice (1) if the statement I alone is sufficient to answer the question;

  b) Mark choice (2) if the statement II alone is sufficient to answer the question ;

  c) Mark choice (3) if both the statements I and II are sufficient to answer the question but neither statement alone is not sufficient;

  d) Mark choice (4) if both the statements I and II together are not sufficient to answer the questions and additional data is required.

1. **What is the value of x + y ?**   ( )
   I) $x - y = x^2 - y^2$ II) $x - y = y - x$

2. **Is the integer 'a' even ?**   ( )
   I) 8a is even   II) 7a is odd

3. **What is the value of the integer a?**   ( )
   I) $\frac{1}{7} < \frac{1}{2+a} < \frac{1}{2}$ II) $a^2 + 24 = 10a$

4. **Will it be a Wednesday tomorrow ?**   ( )
   I) Coming Wednesday is a holiday
   II) It is not Tuesday today.

5. **How old is the son?**   ( )
   I) Mother was 22 years when the son was born
   II) Son retired in his 58th year and by then the mother was no more.

6. **In a class of 120 students, how many girls got distinction.**   ( )
   I) 20 boys in the class got distinction.
   II) 25% of the students in the class got distinction.

7. **What is the value of x ?**   ( )
   I) $2x - 3y = 4$ II) $y^2 + 2y = -1$

8. **What is the present age of A ?**   ( )
   I) A was married in his 25th year.
   II) A was a central government employee and retired in 1998 after completing 60 years.

9. **Who is the heavier among four friends A, B, C and D.**   ( )
   I) B is heavier than A but lighter than D
   II) C is lighter than B

10. **Is A = B = C = D ?**   ( )
    I) A = 2B = C   II) D =3B =C

11. **What is the angle R in the Triangle PQR ?** ( )
    I) $\angle P + \angle Q = 120^0$ II) $2\angle Q + \angle R = 110^0$

12. **Is a > b ?**   ( )
    I) $|a - b| = 25$ II) $2a + b = 9$

13. **A and B are standing on a sunny day. A's shadow is 10 feet long. B's shadow is 9 feet long. How tall is B ?**   ( )
    I) A is standing 2 feet away from B
    II) A is 6 feet tall

14. **What is the value of the integer a ?**   ( )
    I) $|a - 1| < 3$ II) $|a + 3| < 3$

15. **What is the value of the non-negative integer x ?**
    I) 6^x is odd   II) 7^x is odd   ( )

16. **What is the value of a + b ?**   ( )
    I) $a - 2b = 25$ II) $a^2 - 25 = 4ab - 4b^2$

17. **Are the two triangles congruent ?**   ( )
    I) They are both equilateral triangles.
    II) They have equal bases and equal heights.

18. **What is the two-digit number?**   ( )
    I) The sum of the two digits is 6
    II) The difference between the two digits is 2

19. **If x and y are integers, is x > y ?**   ( )
    I) $\frac{x}{3} = \frac{y}{3}$ II) x is a multiple of y

20. **What are the dimensions of a rectangle ?** ( )
    I) Its area is 12 sq.meters
    II) It's diagonal is 5 meters

II) PROBLEM SOLVING

a) Sequence and Series :

Note : In each of the questions numbered 21 to 35 a sequence of numbers or letters that follow a definite pattern is given. Each question has a blank space. This has to be filled by the correct answer from the four given options to complete the sequence without breaking the pattern.

21. 2, 8, 18, 32, ..., 72, 98   (   )
    1) 46   2) 52
    3) 48   4) 50

22. 4, 13, 28, 49, ..., 109, 148   (   )
    1) 76   2) 70
    3) 72   4) 74

23. 0010_2, 0011_2, ..., 0111_2, 1011_2 (   )
    1) 1010_2 2) 1000_2
    3) 0101_2 4) 0110_2

24. 0, 7, 26, 63, ..., 215, 343   (   )
    1) 126   2) 124
    3) 125   4) 127

25. ACEG, IKMO, ..., YACE   (   )
    1) QSUW   2) PRTV
    3) QSUV   4) QSVX

26. 6, 15, 35, ..., 143, 221   (   )
    1) 81   2) 93
    3) 79   4) 77

27. 5, 10, 26, ..., 122, 170   (   )
    1) 48   2) 50
    3) 49   4) 53

28. ABC, DEF, UK, ..., YZA.   (   )
    1) MNO   2) LMN
    3) NOP   4) PQR

29. 6 : 35 : : 77 : ....   (   )
    1) 135   2) 221
    3) 225   4) 321

30. 8 : 16 : : 125 : ....   (   )
    1) 426   2) 138
    3) 625   4) 526

31. AEI, CGK, ..., GKO, IMQ   (   )
    1) EIM   2) FJN
    3) DHL   4) EJM

32. A, H, A, L, ..., H, E   (   )
    1) S   2) T
    3) V   4) U

33. 216, 343, ..., 729.   (   )
    1) 470   2) 512
    3) 570   4) 626

34. BDE, DHL, HPX, ..., FLR.   (   )
    1) JFV   2) PGV
    3) PFV   4) PFU

35. 05-01-1996, 27-01-1996, 18-02-1996, ..., 02-04-1996.   (   )
    1) 08-03-1996   2) 28-02-1996
    3) 12-03-1996   4) 11-03-1996

Note : In questions 36 to 45 pick the odd thing out.

36. 1) 2   2) 3
    3) 5   4) 7

37. 1) 46   2) 58
    3) 69   4) 74

38. 1) 35   2) 77
    3) 91   4) 63

39. 1) 180   2) 247
    3) 240   4) 147

40. 1) 29   2) 47
    3) 51   4) 67

41. 1) 95   2) 91
    3) 92   4) 97

42. 1) B   2) D
    3) I   4) P

43. 1) BAT   2) CAT
    3) DOT   4) PAT

44. 1) 5   2) 50
    3) 122   4) 169

45. 1) 961   2) 531
    3) 169   4) 841

b) Data Analysis :

Note : The following Pie chart shows how the municipal funds are spent under different heads in a year. Study the chart and answer the questions 46 to 50.

Performance of Students of a College

Year	2000	2001	2002	2003	2004	2005	2006
No. of students appeared	750	780	840	960	1040	1200	1430
No. of students passed with distinction	150	130	142	127	308	246	397
No. of students passed	300	390	278	483	472	354	323

46. The percentage of students who have passed with distinction in the year 2006 is   (   )
    1) 26.76%   2) 28.64%
    3) 27.76%   4) 28%

47. In which year the failure percentage is least?   (   )
    1) 2003   2) 2001
    3) 2000   4) 2004

48. In which year the distinction percentage is maximum ? ( )

1) 2004 2) 2006
3) 2001 4) 2000

49. The percentage of students who have passed or passed with distinction in the year 2004. ( )

1) 74% 2) 75%
3) 76% 4) 77%

50. If the policy of the college is to give Rs. 1,000 as prize to each of the students passed with distinction, then in which year the college has spent maximum on this account? ( )

1) 2003 2) 2004
3) 2005 4) 2006

Note : An automobile company manufactures vehicles as given in the following Pie diagram. Study this carefully and answer questions 51 to 55.
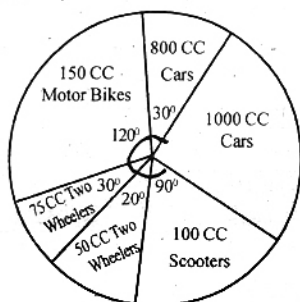
51. The ratio of the 75 CC Two - Wheelers and 50 CC Two - Wheelers is ... ( )

1) 2 : 1 2) 1 : 2
3) 3 : 2 4) 2 : 3

52. The percentage of 150 CC motor bikes in the total production by the company is ( )

1) 30% 2) 33$\frac{1}{3}$%
3) 32$\frac{1}{2}$% 4) 32%

53. If the number of 75CC two-wheelers manufactured in a month is 2700, then the total number of vehicles manufactured by the company in that month is ( )

1) 32400 2) 30860
3) 32600 4) 33800

54. In a period, if the total number of vehicles manufactured by the company is 7200, then the number of 1000 CC cars among them is ( )

1) 1200 2) 1400
3) 1000 4) 1500

55. The ratio of the four-wheelers and two-wheelers produced by the company is ( )

1) 6 : 13 2) 5 : 12
3) 4 : 13 4) 5 : 13

c) Coding and Decoding :

Note : In a certain code the words HONEST, EXAMINATION, BOY, RIGHT and WRONG are respectively written as UBARFG, RKNZVA NGVBA, OBL, EVTUG and JEBAT. Find the process of coding answer the questions 56 to 65.

56. The code for FIGHT is ( )

1) TVTUG 2) SVTUH
3) SWTUG 4) SVTUG

57. The code for ICET is ( )

1) UPRG 2) VPRG
3) VQRG 4) VPSG

58. The code for ARMY is ( )

1) NEZM 2) MEZL
3) NEZL 4) NFZL

59. The code for SOLDIER is ( )

1) FBYQVRE 2) FBZQVRE
3) FBYQVSE 4) FBYQURE

60. The code for SEVEN is ( )

1) FRIRZ 2) FRJRA
3) FRIRB 4) FRIRA

61. Which word is coded as MINISTER ? ( )

1) ZVAVFGRE 2) ZVAVFHRE
3) ZVAVFGSE 4) ZVAVFGRF

62. Which word is coded as KING ? ( )

1) XVAS 2) XVAT
3) XVAU 4) XUAT

63. Which word is coded as HISTORY ? ( )

1) UVFGBEM 2) UVFGBEL
3) UVFGAEL 4) UVFGBEK

64. Which word is coded as PLAN ? ( )

1) CYNZ 2) CYNB
3) CYNA 4) CYND

65. Which word is coded as QUESTION ? ( )

1) DHRFGVBA 2) DHRFGUBA
3) DHRFGVCA 4) DHRFGVDA

(d) Date, Time & Arrangement Problems :

66. The time on the clock is 3.00 p.m. If the hours hand is pointing towards West, then the direction of the minutes hand is ( )

1) North 2) South
3) South-West 4) East

67. If the first day of June is a Saturday, then the date on which the last Saturday of that month falls is ( )

1) 22 2) 28
3) 29 4) 30

68. If 9th March of 1995 is a Saturday, then the 9th March of 1996 is a ( )

1) Wednesday 2) Tuesday
3) Sunday 4) Monday

69. The ratio of the present ages of a father and his son is 2 : 1. If the ratio 10 years ago is 5 : 2, then the present age of the son is ( )

1) 30   2) 25

3) 24   4) 32

70. A is the father of B and C; E is the mother of C and D is the wife of F. If F is the brother of E, then how D is related to B ? ( )

1) Maternal grand-mother

2) Maternal aunt   3) Paternal grand-mother

4) Paternal aunt

71. $a\Delta b = a^2 - ab + b^2 \Rightarrow (a\Delta a)\Delta(a\Delta a) = ?$ ( )

1) a^6 2) a^3 3) a^4 4) a^8

72. $a*b = (a+b-3)^3 + a - b \Rightarrow 1*2 =$ ( )

1) $3*2$ 2) $-(2*3)$

3) $2*1$ 4) $-(2*1)$

73. The number of 3's that are preceded by 5 but not followed by 2 in the following sequence of digits is 314753124532188753816253753 16 75324 ( )

1) 7   2) 5   3) 4   4) 6

74. If N is the set of all positive integers, then

$\{n \in N : |n-4| \le 2\} = ?$ ( )

1) {3, 4, 5}   2) {2, 3, 4, 5, 6}

3) {2, 3, 4, 5}   4) {3, 4, 5, 6}

75. If January 1st falls on Saturday in a year, then the number of Saturdays in that year is ( )

1) 52   2) 51   3) 54   4) 53

SECTION - B
MATHEMATICAL ABILITY

Questions : 75]   [Marks : 75

I) ARITHMETICAL ABILITY :

76. $\dfrac{5^{2/3} \times \sqrt[3]{5^8}}{\sqrt[3]{5^7}} =$ ( )

1) 5   2) 25   3) $\sqrt[3]{5}$ 4) 1

77. $\dfrac{5 \times (2^{k-2}) + 10 \times (2^{k-1})}{10^{k+2}} =$ ( )

1) $\dfrac{1}{8 \times (5^k)}$ 2) $\dfrac{1}{16 \times (5^k)}$

3) $\dfrac{1}{32 \times (5^k)}$ 4) $\dfrac{1}{4 \times (5^k)}$

78. $\left(\dfrac{\sqrt[4]{ab} - \sqrt{b}}{\sqrt{a} - \sqrt[4]{ab}}\right)^{-4} =$ ( )

1) $\dfrac{a^2}{b^2}$ 2) $-\dfrac{a}{b}$

3) $\sqrt{\dfrac{a}{b}}$ 4) $\dfrac{a}{b}$

79. The ratio of the sides of a rectangle is 4 : 9, and the area is equal to 144 sq.m. The perimeter in meters is ... ( )

1) 52   2) 26   3) 18   4) 30

80. The curved surface area of a cylinder is thrice the area of its base. If r is the radius of the base and h is its height, then r : h = ... ( )

1) 3 : 2   2) 3 : 5   3) 2 : 3   4) 2 : 5

81. If $x = \dfrac{5 - \sqrt{21}}{2}$ then $x^2 + \dfrac{1}{x^2} =$ ( )

1) $\dfrac{27}{2}$ 2) $\dfrac{25}{2}$

3) 23   4) 25

82. If $x = \sqrt{\dfrac{7 + 4\sqrt{3}}{7 - 4\sqrt{3}}}$ then $x(x - 14) =$ ( )

1) 1   2) -1 3) $\dfrac{1}{\sqrt{3}}$ 4) $-\dfrac{1}{\sqrt{3}}$

83. The least number of five digits exactly divisible by 456 is ( )

1) 10000   2) 10012

3) 10032   4) 10056

84. The least perfect square which is divisible by each of the numbers 12, 15, 20 and 24 is ( )

1) 3600   2) 4900

3) 6400   4) 8100

85. The least positive integer which leaves a remainder 2, when divided by each of the numbers 4, 6, 8, 12 and 16. ( )

1) 46   2) 48

3) 50   4) 52

86. The g.c.d. and l.c.m. of two numbers are 66 and 384 respectively. If the first number is divided by 2, the resulting answer is 66. The second number is ... ( )

1) 192   2) 196

3) 384   4) 576

87. The l.c.m. and g.c.d. of two numbers are 240 and 16 respectively. If the two numbers are in the ratio 3 : 5, the numbers are : (   )
1) 24, 40　　　　2) 21, 35
3) 36, 60　　　　4) 80, 48

88. The numerator and denominator of a rational number are in the ratio 7 : 8. If 10 is subtracted from numerator and denominator the resulting rational number is $\frac{2}{3}$. The numerator of the original number is ....(   )
1) 12　　2) 14　　3) 16　　4) 18

89. If the numbers 169, 248, 416, 974, 517, 612 and 325 are arranged in descending order based on the sum of the digits of each of these numbers, the middle number will be .... (   )
1) 248　　　　2) 517
3) 612　　　　4) 974

90. Two numbers are respectively 20% and 25% more than a third number. What percent is the first number of the second? (   )
1) 86　　2) 90　　3) 92　　4) 96

91. If the Income Tax is reduced from 15% to 12½%, what difference does it make to a person whose taxable income is Rs. 9,800 ?
1) Rs. 245　　　　2) Rs. 250　　(   )
3) Rs. 205　　　　4) Rs. 650

92. By selling an article for Rs. 990, a trader makes a profit of 12½%. The cost price of the article in rupees is (   )
1) 920　　2) 900　　3) 800　　4) 880

93. A trader allows a discount of 15% on the marked price of an article. How much percentage above the cost price is to be marked to make a profit of 19% ? (   )
1) 40%　　2) 39%　　3) 33%　　4) 29%

94. Four transport companies A, B, C, D rented a parking place. A kept 18 cars for 4 months; B kept 24 cars for 2 months; C kept 28 cars for 6 months and D kept 28 cars for 3 months in the parking place. If A's share of rent is Rs. 3,600, the total rent of the parking place in rupees is (   )
1) 18,000　　　　2) 18,600
3) 21,000　　　　4) 24,000

95. In a business, A invested 3 times as much of B invested and B invested 2/3 of what C invested. If the annual profit is Rs. 55,000, the share of B in thousands of rupees is (   )
1) 12　　2) 10　　3) 15　　4) 30

96. Two pipes A and B can fill a tank in 6 hrs and 8hrs respectively. If they are opened in alternate hours starting in A, the number of hours needed to fill the tank is (   )
1) $3\frac{3}{7}$　　　　2) 6
3) $6\frac{1}{2}$　　　　4) $6\frac{3}{4}$

97. A tank is normally filled in 8 hrs, but takes 2 hrs longer to fill because of leakage. If the tank is full, the time taken by the leak to empty it is ... (   )
1) 36 hrs.　　　　2) 38 hrs.
3) 40 hrs.　　　　4) 44 hrs.

98. A can complete a piece of work in 18 days. B is 20% more efficient than A. The number of days B takes to complete the same piece of work is (   )
1) 15　　2) 12　　3) 10　　4) 9

99. One man or two women or 3 part-timers can complete a piece of work in 48 days, How many days will it take for 2 men, 3 women and 3 part-timers to complete the same piece of work ? (   )
1) 12　　2) 18　　3) 20　　4) 24

100. A train takes 8 secs to pass a person standing on the platform. If the speed of the train is 36 Kmph its length in meters is (   )
1) 80　　　　2) 90
3) 110　　　　4) 115

101. The area (in square cms) of a trapezium, for which the lengths of parallel sides are 20 cms and 23 cms while the distance between the parallel sides is 12 cms, is (   )
1) 238　　　　2) 248
3) 258　　　　4) 264

102. A circle and a square of same perimeter have areas c and s respectively. Then (   )
1) s = c　　　　2) s > c
3) c > s　　　　4) c = πs

103. If the ratio of the circumferences of two circles is 2 : 3 then the ratio of their areas is (   )
1) 4 : 9　　　　2) 3 : 5
3) 5 : 6　　　　4) 3 : 2

104. The area (in sq.cms) of the regular hexagon whose perimeter is 12 cms, is (   )
1) $18\sqrt{3}$　　2) $15\sqrt{3}$　　3) $12\sqrt{3}$　　4) $6\sqrt{3}$

105. Six spherical balls of radius r are melted and cast into a cylindrical rod of the same radius. The height of the rod is ... (   )
1) 4r　　　　2) 6r
3) 8r　　　　4) 12r

106. A cube, made of a metal, with edge 3 cms weighs 12 gms. The weight (in grams) of the cube of edge 12cm, made of the same metal, is ( )
1) 48   2) 64
3) 758   4) 768

107. An isosceles triangle of area 12 sq.cm. has one of its equal sides as 5 cm. The length of the base of the triangle (in cms) is ( )
1) 6   2) 7
3) 8   4) 9

108. 2 tables and 3 chairs cost Rs. 3,500 while 3 tables and 2 chairs cost Rs. 4,000. The cost of a table (in rupees) is ( )
1) 500   2) 1000
3) 1200   4) 1500

109. If m divides a − b we write a ≡ b (mod m), then the incorrect statement, among the following ( )
1) $80 \equiv -1 \pmod 9$ 2) $81 \equiv 1 \pmod{10}$
3) $82 \equiv 5 \pmod{11}$ 4) $83 \equiv -2 \pmod{12}$

110. For any integer a, if a* = 5a − 17 then (5*)* =
1) 23   2) 17   ( )
3) 11   4) 5

(II) ALGEBRAICAL AND GEOMETRICAL ABILITY :

111. The statement $\sim(\sim p \Rightarrow \sim q)$ is equivalent to
1) $\sim p \wedge q$ 2) $p \wedge \sim q$ ( )
3) $\sim p \vee q$ 4) $p \vee \sim q$

112. If p, q are two statements then $\sim(p \vee \sim q)$ is equivalent to ( )
1) $p \wedge \sim q$ 2) $\sim p \wedge \sim q$
3) $\sim p \wedge q$ 4) $p \vee q$

113. If A_n is the set of all multiples of n for n = 1, 2, 3, ... and P is the set of all prime numbers then
$$\underset{p \in P}{U} A_p =$$
( )
1) P   2) {1, 2, 3......}
3) {2, 3, 4, 5,...}   4) {0, ±1, ±2,...}

114. If $D_n = \left\{ x \in \mathfrak{R} : 0 < x \le \dfrac{1}{n} \right\}$ for n = 1, 2, 3,...
then $D_3 \cap D_7 = ...$ ( )
1) D_3 2) D_7 3) D_{10} 4) D_{21}

115. If $f(x) = \log\left(\dfrac{1+x}{1-x}\right)$ and $g(x) = f\left(\dfrac{2x}{1+x^2}\right)$
then $\dfrac{g(x)}{f(x)} =$ ( )
1) 1   2) 2   3) $\dfrac{1}{2}$ 4) $\dfrac{1}{3}$

116. If $f(x) = a^x$ then $\dfrac{f(x+k)}{f(x-l)} =$ ( )
1) f(k)   2) f(−l)
3) f(k − l)   4) f(k + l)

117. $\dfrac{(1-\sec\theta)^2 + (1+\sec\theta)^2}{1+\sec^2\theta} =$ ( )
1) −1   2) 0
3) 1   4) 2

118. $\cos 90^0 \cos 60^0 + \sin 90^0 \sin 60^0 + \sin 30^0 \cos 45^0 =$
1) $\dfrac{1}{4}(\sqrt{2} + \sqrt{12})$ 2) $\dfrac{1}{2}(\sqrt{2} - \sqrt{12})$ ( )
3) $2 + \sqrt{12}$ 4) $2 - \sqrt{12}$

119. If $\sin\theta + \csc\theta = 2$ then $\sin^4\theta + \csc^4\theta =$
1) 16   2) 8   ( )
3) 4   4) 2

120. If $x\cos\theta - y\sin\theta = \alpha$ and $x\sin\theta + y\cos\theta = \beta$ then $x^2 + y^2 =$ ( )
1) α^2 2) β^2
3) $\alpha^2 + \beta^2$ 4) $\alpha^2 - \beta^2$

121. If $f(x) = x^2 + 4$ and $g(x) = x^3 - 3$ then the degree of the polynomial f(g(x)) is ( )
1) 6   2) 5
3) 3   4) 1

122. If $f(x) = 2x^2 + 5x + 1$ and $g(x) = x - 4$ then $\{a \in \mathfrak{R} : g(f(\alpha)) = 0\} =$ ( )
1) $\left\{-\dfrac{1}{2}, 3\right\}$ 2) $\left\{-\dfrac{1}{2}, -3\right\}$
3) $\left\{\dfrac{1}{2}, -3\right\}$ 4) $\left\{\dfrac{1}{2}, 3\right\}$

123. If $x^2 + x - 2$ is a factor of the polynomial $x^4 + ax^3 + bx^2 - 12x + 16$ then the ordered pair (a, b) =
1) (−3, 8)   2) (3, −8)   ( )
3) (−3, −8)   4) (3, 8)

124. If $\dfrac{11}{x} - \dfrac{7}{y} = 1$ and $\dfrac{9}{x} - \dfrac{4}{y} = 6$ then (x, y) =
1) $\left(\dfrac{1}{2}, \dfrac{1}{3}\right)$ 2) $\left(\dfrac{1}{3}, \dfrac{1}{2}\right)$ ( )
3) $\left(\dfrac{1}{2}, -\dfrac{1}{3}\right)$ 4) $\left(-\dfrac{1}{3}, \dfrac{1}{2}\right)$

125. The maximum value of the expression $5 + 6x - x^2$ is ( )
   1) 11   2) 12
   3) 13   4) 14

126. If the second term of an arithmetic progression is 20 and its fifth term is double the first then the sum to 20 terms of the series is ( )
   1) 64   2) 108
   3) 1080   4) 2160

127. If $a = b^2$ then $a^{\frac{1}{3}} . a^{\frac{1}{9}} . a^{\frac{1}{27}} \ldots\ldots\ldots =$ ( )
   1) a 2) b 3) $\dfrac{1}{a}$ 4) $\dfrac{1}{b}$

128. If $a_1 = 7, a_2 = 11, a_3 = 15, \ldots$ and $a_n = 403$ then $n =$ ( )
   1) 97   2) 98
   3) 99   4) 100

129. The coefficient of the term independent of x in the expansion of $\left(\dfrac{3}{2}x^2 - \dfrac{1}{3x}\right)^9$ is ( )
   1) $\dfrac{11}{2}$ 2) $-\dfrac{11}{2}$
   3) $\dfrac{21}{2}$ 4) $-\dfrac{21}{2}$

130. If the 21st and 22nd terms in the expansion $(1 + a)^{44}$ are equal then $a =$ ( )
   1) $\dfrac{7}{8}$ 2) $\dfrac{8}{7}$ 3) $\dfrac{5}{8}$ 4) $\dfrac{8}{5}$

131. If $0 < \theta < 90^0$ and the matrix
   $$A = \begin{pmatrix} \sin^2\theta & 1 \\ 1 & \sec^2\theta \end{pmatrix}$$
   has no inverse then $\theta =$ ( )
   1) 30^0 2) 45^0
   3) 60^0 4) 75^0

132. If $f(\alpha) = \begin{pmatrix} \sin\alpha & -\cos\alpha \\ \cos\alpha & \sin\alpha \end{pmatrix}$ then
   $\sin\alpha . f(\alpha) + \cos\alpha . f\left(\dfrac{\pi}{2} + \alpha\right) =$ ( )
   1) $\begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix}$ 2) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$
   3) $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$ 4) $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

133. $\displaystyle\lim_{x \to 0} \dfrac{\sqrt{1+x} - \sqrt{1-x}}{x} =$ ( )
   1) -1 2) 0
   3) 1 4) 2

134. $\displaystyle\lim_{x \to \frac{\pi}{2}} \dfrac{1 + \cos 3x}{1 - \cos 5x} =$ ( )
   1) 0 2) 1
   3) $\dfrac{3}{5}$ 4) $\dfrac{9}{25}$

135. If $x = \sqrt{y + \sqrt{y + \sqrt{y + \ldots\ldots}}}$ then $\dfrac{dy}{dx} =$ ( )
   1) $x - 1$ 2) $x + 1$
   3) $2x - 1$ 4) $2x + 1$

136. If P is a point on the circle with centre C and if AB is a chord of the circle such that $\angle APB = 30^0$ then $\angle ACB =$ ( )
   1) 30^0 2) 45^0
   3) 60^0 4) 90^0

137. A parallelogram and a triangle lie on the same base ; and the third vertex of the triangle lies on the opposite side parallel to the base. If the area of the parallelogram is 72 sq.cm, then the area of the triangle (in sq.cms) is ( )
   1) 144   2) 72
   3) 36   4) 18

138. If the points $(k, -3), (2, -5)$ and $(-1, -8)$ are collinear then $k = \ldots$ ( )
   1) 0   2) 4
   3) -2 4) -3

139. The equation of the line with slope $-\dfrac{3}{4}$ and y-intercept 2 is ( )
   1) $3x + 4y = 8$ 2) $3x + 4y + 8 = 0$
   3) $4x + 3y = 2$ 4) $3x + 4y = 4$

140. If the lines $\alpha x + 2y + 1 = 0$, $\beta x + 3y + 1 = 0$ and $\gamma x + 4y + 1 = 0$ pass through a point then $\alpha + \gamma =$ ( )
   1) β 2) 2β
   3) $\dfrac{1}{\beta}$ 4) $\dfrac{1}{2\beta}$

(III) STATISTICAL ABILITY :

141. If m is the arithmetic mean of $a_1, a_2, \ldots a_n$ then the arithmetic mean of $\alpha a_1 + \beta, \alpha a_2 + \beta, \ldots \alpha a_n + \beta$ is ( )
    1) m
    2) $m + \beta$
    3) $\alpha m + \beta$
    4) αm

142. The mean deviation of the observations 1, 3, 7, 14, 5 about their median is ( )
    1) 3
    2) 3.6
    3) 4
    4) 4.2

143. The mode of the observations : ( )
    9, 9, 8, 7, 6, 3, 7, 2, 7, 6, 9, 7, 8, 7 is
    1) 9
    2) 8
    3) 7
    4) 6

144. If the standard deviation of $x_1, x_2, \ldots, x_n$ is σ then the standard deviation of $y_1, y_2, \ldots y_n$, where $y_j = 3x_j + 5$ for j = 1, 2, …..n is ( )
    1) $\sqrt{3}\sigma$
    2) 3σ
    3) $3\sigma + 5$
    4) $\sqrt{3}\sigma + 5$

145. The mean and variance of the observations 6, 7, a, b, 10, 12, 12, 13 are 9 and 9.25 respectively. Then the ordered pair (a, b) = ( )
    1) (7, 3)
    2) (8, 6)
    3) (8, 4)
    4) (9, 5)

146. For observations $x_1, x_2, \ldots, x_n$ the sum
    $$\sum_{j=1}^{n} |x_j - C|$$ is minimum if C is the …………. of the observations.
    1) mean
    2) median ( )
    3) mode
    4) variance

147. If three unbiased coins are tossed simultaneously then the probability of getting exactly two heads is ( )
    1) $\frac{1}{8}$
    2) $\frac{2}{8}$
    3) $\frac{3}{8}$
    4) $\frac{4}{8}$

148. A person gets as many rupees as the number he gets when an unbiased 6 faced die is thrown. If two such dice are thrown the probability of getting Rs. 10 is ( )
    1) $\frac{1}{12}$
    2) $\frac{5}{12}$
    3) $\frac{13}{36}$
    4) $\frac{19}{36}$

149. A number n is chosen at random from {1, 2, …, 10}. The probability that n satisfies the equation $(x - 3)(x - 6)(x - 7)(x - 11) = 0$ is
    1) $\frac{2}{5}$
    2) $\frac{3}{5}$ ( )
    3) $\frac{3}{10}$
    4) $\frac{7}{10}$

150. Let E be the set of all integers with 1 in their units place. The probability that a number n chosen from, {2, 3, 4,………, 50} is an element of E is ( )
    1) $\frac{5}{49}$
    2) $\frac{4}{49}$
    3) $\frac{3}{49}$
    4) $\frac{2}{49}$

SECTION- C
COMMUNICATION ABILITY

Questions : 50] |Marks : 50

PART - 1

Choose the correct meaning for the word :

151. Epitome ( )
    1) Quintessence
    2) Rebuttal
    3) Harangue
    4) Depredation

152. Niggardly ( )
    1) Black
    2) Generous
    3) Miserably
    4) Miserly

153. Abnegation ( )
    1) Self praise
    2) Self criticism
    3) Self sacrifice
    4) Self denial

154. Surreptitious ( )
    1) Abstract
    2) Secret
    3) Secretive
    4) Mysterious

155. Serendipity ( )
    1) Peace
    2) Luck
    3) Old
    4) Fate

156. Hiatus ( )
    1) Tall
    2) Creeper
    3) Gap
    4) Obscure

Fill in the blank choosing the correct word :

157. A …………. of surgeons arrived at the scene of the disaster. ( )
    1) team
    2) crew
    3) company
    4) cast

158. The bank robbers .... him at gunpoint to open the safe.   (   )
1) helped   2) persuaded
3) beat   4) forced

159. A committee has been set up to ..... on the problem of terrorism in this region.   (   )
1) investigate   2) inquire
3) research   4) report

160. His .... to my failures were not in good taste.
1) illusions   2) accolades   (   )
3) aversion   4) allusions

PART - 2

Choose the correct answer :

161. Franchise is   (   )
1) a bond   2) a letter of intent
3) an agreement enabling a third party to sell
4) a business deal

162. WiFi is the abbreviation for   (   )
1) wireless identity for internet
2) world wide internet for fast information
3) world wide imaging for intelligence
4) wireless fidelity

163. Copy-writer is a person who   (   )
1) conceives the ideas and writes the advertisement
2) transcribes the product design
3) assists public relation works
4) represents the management of a company at a news conference

164. The receipt given by an air carrier for shipment of goods is called   (   )
1) Air Delivery Note
2) Air Cargo Acknowledgement
3) Airway Bill   4) Air Parcel Receipt

165. The Chamber of Commerce for the IT Software and Services industry in India is
1) NASSCOM   2) CII   (   )
3) NIC   4) NSE

166. A general rise in prices measured against a standard level of purchasing power is referred to as
1) consumer price index   (   )
2) cost of living index
3) inflation index   4) GDP

167. A text file contains   (   )
1) alphabetical and numerical data
2) a spread sheet   3) only alphabetical data
4) only numerical data

168. When a contract becomes null and void, it means that the contract is   (   )
1) illegal   2) not binding
3) immoral   4) ripe for implementation

169. A web tool that consists of a searchable data base of websites is called   (   )
1) Google   2) Web Directory
3) Search Engine   4) World Wide Web

170. A device with volatile memory is   (   )
1) RAM   2) ROM
3) Magnetic Disk   4) Compact Disk

PART - 3

Choose the correct answer :

171. "I hardly speak to my boss." In this sentence, the speaker   (   )
1) often speaks to her boss
2) speaks to her boss rudely
3) rarely speaks to her boss
4) hates to speak to her boss

172. "I resent his tongue-in-cheek comments." The underlined phrase means   (   )
1) harsh   2) sarcastic
3) vulgar   4) venomous

173. "If I were you, I wouldn't take such a risk." The speaker is   (   )
1) giving advice   2) warning himself
3) giving a command
4) saying he wants to become like the listener

174. "The lecture would have been completed by now." The active form of this sentence is
1) They will complete the lecture now (   )
2) They would complete the lecture by now
3) They would have completed the lecture by now
4) They would be completing the lecture by now

175. "Had he come, he would have enjoyed the show." The sentence means that   (   )
1) he has come   2) he had come
3) he will come   4) he did not come

176. Man : "Could I give you a hand moving that bed?"

Woman : "That would be nice." What does the woman mean ? ( )

1) She won't give him a hand
2) She'd like him to help her
3) The bed is too heavy to move around alone
4) It would be nice if someone could help with the move

177. All political parties are <u>tarred with the same brush</u>. The underlined expression means : .

1) treated equally ( )
2) possess the same defects
3) follow the same principles
4) profess the same policies

Fill in the blank with the appropriate phrase/verb/ preposition :

178. You must apologise _____ what you said.

1) for   2) about   ( )
3) on   4) in

179. Globalisation has been _____ favourably on our economy. ( )

1) impacting   2) improving
3) interpolating 4) intervening

180. I shall not be late for dinner _____ ( )

1) unless the train will be late
2) unless the train will not be late
3) unless the train is late
4) if the train is late

181. I _____ my uncle as soon as he arrived in India.

1) called on   2) called with ( )
3) called out   4) called at

182. He takes no interest ____ polities. ( )

1) at   2) over
3) in   4) for

183. However you may try, you cannot _____ to your position for long. ( )

1) hold out   2) hold up
3) hold on   4) hold over

184. Those shoes don't _____ that dress. ( )

1) go on   2) go with
3) go for   4) go by

185. He was acquitted _____ the charge of sedition.

1) for   2) upon
3) of   4) on   ( )

PART - 4

Read the following passage and answer questions 186 - 190 :

When we speak of the freedom of the media, we usually mean freedom in a very technical and restricted sense, we feel that if we are free from government direction or censorship, the media have their freedom. In this sense our TV channels, and especially our press, is relatively free. They can attack the policies of the government, expose scandals or comment on the political careers of ministers. Public opinion also is supposed to restrict the function of the media. Generally speaking the media works to secure and sustain that central doctrine of democracy as we understand it........., that the state is not the master but servant of the people, so people's interests play a great role defining freedom of the media! But is it really true ? Our media is free only in this restricted sense.The real restrictions come from companies from whom it gets money for advertising their products and the wealth of the person or company that owns the channel or the paper. If the channel dares to support a public policy like "Ban excessive use of cars and use public transport (or) "Ban the use of air-conditioners or refrigerators because they contribute to the pollution companies will refuse to support such policies by stopping their advertisements.

186. What is the popular perception of "freedom of the media" ? ( )

1) lack of state intervention
2) lack of support from companies
3) censorship of the government
4) restrictions imposed by rules

187. Why does the writer think that our media enjoys freedom ? ( ).

1) It gets support from the government
2) Government does not impose restrictions
3) It criticises political leaders
4) It can support the policies that are favoured

188. What is the function of the government according to the writer ? ( )

1) to protect the people
2) to serve the people
3) to care for the people
4) to entertain the people

189. Who really controls the media ? ( )

1) public opinion and pressure
2) democratic structure of the society
3) government policies
4) owners of business houses

190. Which function of advertisements is referred to in the text ? ( )

1) resource generation   2) increasing sales .
3) entertainment value   4) public education

Read the following passage and answer questions 191 - 195 :

Everyone knows the 'touch-me-not' plant which folds up its leaves when touched. How the plant is able to do this has been something of a puzzle, and it is only in recent years that a possible answer has been found. At the lower end of each leaf is a tiny swelling called the pulvinus. Scientists have shown that the pulvinus acts as the 'brain' or control center of the leaf. The folding - up of the leaf is controlled by the pulvinus. Exactly how this happens is still not very clear. It has been discovered, through some experiments, that when a mild electric shock is given to the pulvinus, it contracts. The process by which the pulvinus controls the folding of the leaf may not be very different, therefore, from that by which animals are able to control their muscles. It is well known that animal cells - specially the cells in the nerves and muscles - contain a small electrical charge. It is this charge which causes the contraction of muscles. When a leaf is touched there seems to be a change in the pressure of the liquid inside its cells. This change of pressure, it is believed, reaches the pulvinus and turns on some kind of electrical switch. As a result, an electrical charge is produced which makes the pulvinus contract, causing the leaf to fold up.

191. This passage is about ( )
1) how the touch - me - not plant grows into a tree
2) why the touch - me - not plant folds up its leaves when touched.
3) how the touch - me - not plant reproduces
4) how the touch - me - not plant attracts animals.

192. **When does the pulvinus contract?** ( )
1) when a mild electric shock is given
2) when it rains
3) when air pressure increases
4) when a leaf is separated from the plant

193. **What causes contraction of muscles in animals?** ( )
1) locomotion   2) nerves
3) respiration   4) electric charge

194. **Where is the pulvinus located on the touch - me -not plant?** ( )
1) on the surface of the leaf
2) on the lower end of the leaf
3) on the stalk   4) on the stem

195. **What happens when the leaf of a touch - me - not plant is touched?** ( )
1) a change occurs in the pressure of the liquid inside the cells.
2) the colour of the leaf changes
3) a change occurs in the size of the leaf
4) the leaf withers away

Read the following passage and answer questions 196 - 200 :

A beggar was sitting at a railway station with a bowl full of pencils. A young executive passed by and dropped a dollar in the bowl. He then boarded the train. Before the doors closed, something came to his mind and he went back to the beggar, grabbed a bunch of pencils, and said, "They are priced right, After all you are a business person and so am I", and he left. Six months later, the executive attended a party. The beggar was also there in a suit and tie. The beggar recognised the executive, went upto him and siad, "You probably don't recognise me but I remember you?" He then narrated the incident that happened six months before. The executive said, "Now that you have reminded me, I do recall that you were begging. What are you doing in your suit and tie?" The beggar replied", you probably don't know what you did for me that day. You were the first person in my life who gave me back my dignity. You grabbed the bunch of pencils and said, "They are priced right. After all, you are a business person and so am I." After you left, I thought to myself, what am I doing here? Why am I begging? I decided to do something constructive with my life. I packed my bag, started working and here I am. I just want to thank you for giving me back my dignity, That incident changed my life."

196. **Where did the executive meet the beggar for the first time?** ( )
1) aboard the train   2) at the railway station
3) at a party   4) on the street

197. **What prompted the executive to grab the bunch of pencils from the beggar?** ( )
1) he needed a pencil 2) he was a business man
3) the train was leaving
4) he wanted to treat the beggar differently

198. **When the executive uttered, "What are you doing in your suit and tie?" he was showing his** ( )
1) annoyance   2) disgust
3) sarcasm   4) astonishment

199. **What brought about the change in the life of the beggar?** ( )
1) the dollar received from the executive
2) restoration of his dignity by the executive
3) the train journey   4) introspection

200. **What did the beggar decide to do to transform his life?** ( )
1) Constructive work 2) Travel
3) Attend parties   4) Dress well

KEY

1) 4	2) 2	3) 3	4) 2	5) 4	6) 3	7) 3	8) 2	9) 3	10) 3
11) 1	12) 4	13) 2	14) 3	15) 1	16) 4	17) 3	18) 4	19) 1	20) 3
21) 4	22) 1	23) 3	24) 2	25) 1	26) 4	27) 2	28) 4	29) 2	30) 3
31) 1	32) 4	33) 2	34) 3	35) 4	36) 1	37) 3	38) 4	39) 2	40) 3
41) 4	42) 1	43) 3	44) 4	45) 2	46) 3	47) 4	48) 1	49) 2	50) 4
51) 3	52) 2	53) 1	54) 2	55) 4	56) 4	57) 2	58) 3	59) 1	60) 4
61) 1	62) 2	63) 2	64) 3	65) 1	66) 2	67) 3	68) 4	69) 1	70) 2
71) 3	72) 4	73) 3	74) 2	75) 4	76) 1	77) 2	78) 4	79) 1	80) 3
81) 3	82) 2	83) 3	84) 1	85) 3	86) 1	87) 4	88) 2	89) 2	90) 4
91) 1	92) 4	93) 1	94) 2	95) 2	96) 4	97) 3	98) 1	99) –	100) 1
101) 3	102) 3	103) 1	104) 4	105) 3	106) 4	107) 1	108) 2	109) 4	110) 1
111) 1	112) 3	113) 3	114) 2	115) 2	116) 4	117) 4	118) 1	119) 4	120) 3
121) 1	122) 3	123) 2	124) 1	125) 4	126) 3	127) 2	128) 4	129) –	130) 1
131) 2	132) 2	133) 3	134) 2	135) 3	136) 3	137) 3	138) 2	139) 1	140) 2
141) 3	142) –	143) 3	144) 2	145) 3	146) 2	147) 3	148) 1	149) 3	150) 2
151) 1	152) 4	153) 4	154) 3	155) 2	156) 3	157) 1	158) 4	159) 4	160) 4
161) 3	162) 4	163) 1	164) 3	165) 1	166) 1	167) 1	168) 2	169) 3	170) 1
171) 3	172) 2	173) 1	174) 3	175) 4	176) 2	177) 2	178) 1	179) 1	180) 3
181) 1	182) 3	183) 3	184) 2	185) 3	186) 1	187) 2	188) 2	189) 4	190) 1
191) 2	192) 1	193) 4	194) 2	195) 1	196) 2	197) 4	198) 4	199) 2	200) 1