PNUE - MCA 2007

1. A and B are in the ratio 5 : 4. B and C are in the ratio 6 : 7 then $A : B : C$ is
(a) 30 : 24 : 28   (b) 5 : 10 : 7
(c) 5 : 4 : 7   (d) 15 : 12 : 14

2. Some pumps discharge at 50 kI a minute can irrigate 4 hectares in 8 hours. If the flow is 40 kI a minute, in what time can they irrigation 6 hectares ?
(a) 15 hours   (b) 6 hours and 40 minutes
(c) 9 hours   (d) 9 hours and 36 minutes

3. x men can do a piece of work in y days. How many men are requried to it in z days.
(a) $\dfrac{zy}{x}$ (b) $\dfrac{xy}{z}$ (c) $\dfrac{xz}{y}$ (d) $\dfrac{z}{(xy)}$

4. If $\dfrac{a}{b} = \dfrac{c}{d}$ which of the following is not true ?
(a) $\dfrac{(a+3c)}{(b+3d)} = \dfrac{(a-b)}{(c-d)}$ (b) $\dfrac{(a+c)}{(b+d)} = \dfrac{(a-c)}{(b-d)}$
(c) $\dfrac{(a+b)}{(c+d)} = \dfrac{(a-b)}{(d-c)}$ (d) $\dfrac{(a+b)}{(c+d)} = \dfrac{(b-a)}{(c-d)}$

5. A student is required to get 40% marks to pass. He gets 253 marks and fails by 27 marks. The total marks of the exam is
(a) 600   (b) 500   (c) 700   (d) 800

6. A's income is 20% more than that of B's. Find by what percent B's income is less than that of A
(a) 16.67%   (b) 20%   (c) 25%   (d) 10.75%

7. The population on a town is increased by 10% in a year and then decreased by 10% in the next year. After the second year by what percent is the population more or less than that of 2 years ago ?
(a) no increase   (b) 1% more
(c) 1% less   (d) 10% more

8. A radio is sold at Rs. 1150. Repairing charges amounted to Rs. 50. If there is a profit of 15% find cost price
(a) 1000   (b) 950   (c) 1050   (d) 1045

9. The cost price of 10 articles is the same as the selling price of 8 articles. Find the profit percent.
(a) 25%   (b) 20%   (c) 30%   (d) 10%

10. An article was sold at a gain of 8%. If it had been sold for 10 paise more the gain would have been 18%. Find the cost price.
(a) Rs. 100   (b) Re. 1   (c) 10 Paise   (d) Rs. 10

11. Badri can do a piece of work in 10 days. Sriram can do the same work in 8 days. Both work together for 2 days and Badri stops working. How long will it take Sriram to complete the remaining work.
(a) 18 days   (b) 16 days
(c) 4.4 days   (d) 6 days

12. If 9 men and 5 boys do in a day as much work as 5 men and 11 boys. How many men can do the work of 9 boys ?
(a) 6 men   (b) 9 men   (c) 12 men   (d) 8 men

13. I have to be at a place at 2 p.m. I find that if I walk at 4 km an hour I can reach the place at 2:05 pm and if at 5 km an hour, I can reach the place at 1:50 p.m. How for I have to go ?
(a) 4 km   (b) 5 km   (c) 6 km   (d) 1 km

14. I had 18 km to reach a place X. After walking a few km at 4 km per hour I changed my speed to 3 km per hour. If I took 5 hours to reach X at what distance from X, I changed my speed ?
(a) 9 km   (b) 3 km   (c) 12 km   (d) 6 km

15. The interest on a certain loan is Rs. 100 in the first year and Rs. 205 in the first two years. What is the rate percentage ?
(a) 5%   (b) 4%   (c) 10%   (d) 6%

16. The difference between S.I. and C.I. for two years on a certain sum of money at 4% is Rs. 160. Find the sum.
(a) 1.5 lakhs   (b) 1 lakh
(c) 0.75 lakh   (d) 2 lakh

17. What sum of money will amount to Rs. 1352 in two years at 4% compound interest ?
(a) Rs. 1000   (b) Rs. 1150   (c) Rs. 1250   (d) Rs. 1200

18. How many terms of the series $8 + 10 + 12 + \ldots$ must be taken to make 228 ?
(a) 12   (b) 11   (c) 10   (d) 13

19. The sum of three numbers is A.P. is 51 and the product of the extremes is 273. Find the greatest number in the A.P.
(a) 17   (b) 21   (c) 13   (d) 19

20. Find the next number in the sequence 2, 5, 10, 17, 28, 41, ...
(a) 58   (b) 54   (c) 50   (d) 56

21. If $4x - x^2 - ab < 0$ for all values of x, then
(a) $b > 4$ (b) $b < 2$ (c) $b > 2$ (d) $b > 3$

22. The number of mappings from $\{a, b, c\}$ to $\{x, y\}$ is
(a) 3   (b) 6   (c) 8   (d) 9

23. If $f = \{(6, 2), (5, 1)\}$, $g = \{(2, 6), (1, 5)\}$ then fo $g =$
(a) $\{(6, 6), (5, 5)\}$
(b) $(2, 2), (1, 1)$
(c) $\{(6, 2) (2, 6), (5, 1), (1, 5)\}$
(d) None of these

24. If $A = \{1, 2, 3\}$, $B = \{a, b, c, d\}$. The number of subsets in the Cartesian product of A and B is
(a) 2^{12} (b) 2^7 (c) 12   (d) 7

25. The solution of the equation $x^{2/3} - 3x^{1/3} + 2 = 0$ is
(a) 1, 2   (b) 1, 8   (c) 2, 6   (d) 1, 4

26. $f(x) = ax^2 + bx + c$, then the solution of $f'(x) = 0$ is
(a) A.M. of the roots of $f(x) = 0$
(b) G.M. of the roots of $f(x) = 0$
(c) H.M. of the roots of $f(x) = 0$
(d) None of these

27. Which of the following may be true for a quadratic equation (α is real) ?
(a) If α is a root, $1/\alpha$ is also a root
(b) If α is a root, $-\alpha$ is also a root
(c) If α is a root, $i\alpha$ is also a root
(d) If $i\alpha$ is a root, $-i\alpha$ is also a root

28. If α and β are the roots of $|x^2 + x + 5| + 6x + 1 = 0$ then $\alpha + \beta$

(a) 7   (b) – 7   (c) 5   (d) – 5

29. If $a + b + c = 0$ then one root of the equation $ax^2 + bx + c = 0$ is

(a) $-\dfrac{b}{a}$ (b) $-\dfrac{c}{a}$ (c) $\dfrac{a+c}{a}$ (d) $\dfrac{a+b}{a}$

30. If a and b are positive integers such that $a^3 - b^3$ is a prime number, then $a^3 - b^3$ is

(a) $a^2 + ab + b^2$ (b) $a^2 - ab + b^2$

(c) $a + b$ (d) $a - b$

31. The remainder in the divisor of 3^{40} by 23 is

(a) 13   (b) 12   (c) 14   (d) 15

32. $(12! + 1)$ is divisible by

(a) 11   (b) 13   (c) 14   (d) 7

33. If two dice are tossed the probability of getting the sum at least 5 is

(a) $\dfrac{7}{12}$ (b) $\dfrac{11}{12}$ (c) $\dfrac{1}{2}$ (d) $\dfrac{5}{6}$

34. A and B play a game of dice. A throws the die first. The person who first gets a 6 is the winner. What is the probability that A wins ?

(a) $\dfrac{6}{11}$ (b) $\dfrac{1}{2}$ (c) $\dfrac{5}{6}$ (d) $\dfrac{1}{6}$

35. If $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$, then which of the following is true ?

(a) $A^2 - 4A + I = O$ (b) $A^2 + 4A + I = O$

(c) $(A - 4I)(A + I) = O$ (d) $(A + 4I)(A - I) = O$

36. A is a square matrix of order 3; then which of the following not true ? $|A|$ means determinant

(a) $|A + A'| = |A| + |A'|$

(b) $|A * A| = |A||A|$

(c) $|kA| = k^3|A|$ where k is a constant

(d) $|-A| = -|A|$

37. If $A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 2a & 2b & -1 \end{pmatrix}$ then A^2 is

(a) null matrix   (b) unit matrix

(c) A (d) $- A$

38. If AB is a zero matrix, then

(a) $A = O$ or $B = O$

(b) $A = O$ and $B = O$

(c) It is not necessary that either A or B should be O

(d) None of these

39. MICR code is used in

(a) Letters   (b) Cheques

(c) Punched Cards   (d) Magnetic Tapes

40. In evaluating expressions the following priorities are used. Integer/division (/) and multiplication (*) have same priority but higher than addition (+) and subtraction (−) which have same priority. Left associativity is used for operators. Find the value of the following integer arithmetic expression. (7 mod) * 5/2 + 10/3 * 8 + 2 mod operator represents modulus operation i.e., remainder of division

(a) 42   (b) 28   (c) 4   (d) 31

Part - B

Directions (41 - 46): There is a six floor apartment complex in Chennai. There are two flats in each floor. The following persons live in this complex. They are

(i) Kumar   (ii) Ram   (iii) Joseph   (iv) Singh

(v) Naveen   (vi) Siva   (vii) Abhi   (viii) Abdul

(ix) Amar   (x) Akbar   (xi) Antoney   (xii) Jain

No more than two persons live in the same apartment. Some apartments may be empty. Ram and his roommate live two floors above Abdul and his roommate Abhi Kumar lives alone, three floors below Siva and two floors below Antoney. Singh lives one foor below Abdul and Arjun.

Joseph lives three above the floor on which Amar and Akbar have single apartments. Jain and Naveen live in single apartment two floors below Singh.

41. Which of the following list of persons named below in the correct order, going from bottom floor to the Top ?

(a) Jain, Amar, Singh, Abdul, Ram, Abhi

(b) Naveen, Amar, Kumar, Abhi, Joseph, Ram

(c) Jain, Akbar, Joseph, Antoney, Ram, Abhi

(d) Ram, Antoney, Abdul, Singh, Akbar, Jain

42. Which of the follwoing pair must live in the same floor

(i) Joseph and Antoney

(ii) Kumar and Singh

(iii) Abdul and Ram

(a) (i) only   (b) (i) and (ii) only

(c) (ii) and (iii) only   (d) (i) and (iii) only

43. Ram's roommate assuming to be one of these persons is

(a) Joseph   (b) Singh   (c) Siva   (d) Naveen

44. Jain lives on the

(a) First floor   (b) Second floor

(c) Third floor   (d) Fourth floor

45. An empty apartment may be found in the

(a) Fourth floor only

(b) Fifth floor only

(c) Third or Sixth but not both

(d) Fourth or Sixth or both

46. Mohan lives with a roommate. His roommate could be any one of the following except

(a) Siva   (b) Singh   (c) Antoney   (d) Akbar

Directions (47 - 50):

(i) A causes B or C but not both

(ii) F occurs only if B occurs

(iii) D occurs if B or C occurs

(iv) E occurs only if C occurs

(v) J occurs only if E or F occurs

(vi) D occurs G or H or both

(vii) H occurs if E occurs

(viii) G occurs if F occurs

47. If A occurs, which of the following may occur ?

(i) F and G (ii) E and H

(iii) D

(a) (i), (ii) and (iii)

(b) (i) and (iii) or (ii) and (iii) but not both

(c) (i) only
(d) (iii) only

48. If B occurs which must occur ?
(a) F and G (b) D and G (c) D (d) G and H

49. If J occurs which must have occurred ?
(a) E (b) Both B and C
(c) Either B or C (d) Both E and F

50. Which may occur as a result of a cause not mentioned ?
(i) D (ii) A
(iii) F
(a) (i) only (b) (ii) only
(c) (i) and (ii) only (d) (ii) and (iii) only

Directions (51-53): A Cricket team has four bowlers named Singh, Srinath, Prasad and Gupta.
Each is best known for bowling one type of ball
Half Spin, Medium Pace, Fast Ball, Leg Spin
Each is also used one style of delivery
Short run up, long run up, side run up, medium run up
Prased is best known for Fast Ball
Neither Srinath or Gupta uses long run up
The bowler who uses medium run up is best known for Half Spin
Gupta is best known for Leg Spin
Singh uses short run up

51. Which of the following correctly matches a bowler with his best known ball and style of delivery ?
(a) Singh – Medium Pace – Long run up
(b) Prasad – Fast Ball – side run up
(c) Srinath – Half Spin – Medium run up
(d) Gupta – Leg Spin – Medium run up

52. In a four game series the Caption of the team decides to use Half Spin first, who uses long run up second, Medium pacer third, In which order the bowlers appear ?
(a) Prasad, Srinath, Gupta, Singh
(b) Srinath, Prasad, Singh, Gupta
(c) Prasad, Srinath, Singh, Gupta
(d) Srinath, Prasad, Gupta, Singh

53. During the game if, the starting bowler is incffective he will be replaced by another bowler. All the following are possible except
(a) Medium pacer replaced by a bowler who uses short run up
(b) Leg Spinner is replaced by Prasad
(c) Singh is replaced by Half Spinner
(d) Fast ball bowler is replaced by a bowler with side run up

54. Find the remainder of 321317 divided by 3
(a) 1 (b) 2 (c) 3 (d) 0

55. The smallest angle in degree between the hour and minute needles of a clock when the time is 12 hr 30 mt is
(a) $180°$ (b) $165°$ (c) $196°$ (d) $150°$

56. The collating sequence of five alphabets is W, P, Z, A, E. Given four strings
(i) AZPWW (ii) APAEP
(iii) ZPAPA (iv) ZAPWE
which will be the first string of the above collating sequence ?
(a) (i) (b) (ii) (c) (iii) (d) (iv)

57. How many numbers between 100 and 300 (inclusive) is divisible by 3 ?
(a) 100 (b) 66
(c) 76 (d) None of these

58. Which of the following figures has the largest area for the given circumference ?
(a) Square (b) Triangle (c) Circle (d) Ellipse

59. If $2 < r < 8$ and $1 < s < 5/2$ which of the following expresses all possible values of rs ?
(a) $1 < rs < 5$ (b) $2 < rs < 20$
(c) $5/2 < rs < 8$ (d) $5/2 < rs < 20$

60. A pipe line of length x cm is cut into two segments such that the length of one segment is two cm more than three times the length of other segment. Which of the following is the length in cm of the longer segment ?
(a) $\frac{(x+4)}{3}$ (b) $\frac{(3x+2)}{3}$ (c) $\frac{(x-2)}{4}$ (d) $\frac{(3x+2)}{4}$

61. 5×10^3 is what percent of $\frac{1}{5} \times 10^2$
(a) 2500% (b) 25000%
(c) 20000% (d) 24900%

62. The area of the circle whose centre is at $(0. 0)$ is 25π. The circle passes through all the points except
(a) $(-5, 0)$ (b) $(5, 0)$ (c) $(5, 5)$ (d) $(0, 5)$

63. A class room has r rows of desks with d desks in each row. On a particular day when all pupils are present 3 seats are left vacant (one student per desk). The number of pupils in the class is
(a) $dr - 3$ (b) $d + r + 3$ (c) $dr + 3$ (d) $\frac{r}{d} + 3$

64. The length of a rectangle is increased by 50%. By what per cent the width has to be decreased to maintain the same area ?
(a) 33.33 (b) 50 (c) 66.67 (d) 150

65. If the radius of a circle is 0.5 meter, how many revolution does the wheel make per kilometre ?
(a) 100 (b) 200 (c) $\frac{1000}{\pi}$ (d) $\frac{2000}{\pi}$

66. The average of 5, 10, 15 and X is 20. What is X ?
(a) 20 (b) 25 (c) 45 (d) 50

67. What is the largest prime factor of 255 ?
(a) 15 (b) 5 (c) 51 (d) 17

68. In an Indo-American committee, 2/3 of the members are men, and 3/8 of the men are Americans. if 3/5 of the committee members are Indians. What fraction of the members are American woman ?
(a) $\frac{3}{20}$ (b) $\frac{11}{60}$ (c) $\frac{5}{12}$ (d) $\frac{2}{5}$

70. A sequence of numbers begin 1, 1, 1, 2, 2, 3 and repeats this pattern for ever. What is the sum of 141st, 143rd and 145th number ?
(a) 4 (b) 5 (c) 6 (d) 7

71. The product of the three hexadecimal numbers $2^{14} \times 8^2 \times 10^3$ could be
(i) 10^8 (ii) 2^{20} (iii) 8^{11} (d) 16^8
The correct answer is
(a) I only (b) I and II (c) IV only (d) I and IV

72. In Boolean Algebra given two variables A and B, find the value of $AB + A\wedge B + {}^\wedge AB + {}^\wedge A\wedge B$; $^\wedge$ refers to NOT of the symbol that follows
(a) 0   (b) 1   (c) $A + B$ (d) A

73. The following is a FORTRAN program segment
$I = 3$
$DO = 10 J = 2, 11, 4$
$10\ I = I + J$
The value of I after this program segment will be
(a) 47   (b) 11   (c) 21   (d) None of these

74. $K = 0$
DO 10 I = 1, 10
DO 10 J = 1, 5
If odd (J) then $K = K + 1$ else $K = K - 1$
10 Continue
Odd (J) is true if J is odd number.
The value of K after this program segment will be
(a) 0   (b) 10   (c) 15   (d) 5

75. In a C language program segment a, b, c are integers $a = 2$, $b = 1, c = 3$
The statement is print ("% d, % d, % d", $a = b + c, b = a + c$, $c = a + b$);
The printed values are
(a) 4, 5, 3   (b) 4, 7, 11   (c) 8, 5, 3   (d) None of these

76. Which of the following is not a programming language ?
(a) ADA   (b) LISP   (c) PL/I   (d) BEANS

77. Minimum number of comparisons required to find the largest of a given set of N numbers is
(a) N (b) $N - 1$ (c) $N + 1$ (d) N^2

78. Consider the following C program segment
$j = 0$;
for $(I = 1; I <= 10; I++)$
If $(I \bmod 3) == 1)$ then $j = j + 1$;
else if $(I \bmod 3) == 2)$ then $j = j * 1$
else $j = 0$;
mod returns the remainder of integer division
The value of j after the loop will be
(a) 1   (b) 0   (c) 55   (d) None of these

79. LAST in FIRST out data structure is called
(a) Queue   (b) Tree   (c) Stack   (d) Graph

80. The binary number corresponding to the following decimal expression is
$10 \times 256 + 12 \times 16 + 9$
(a) 110101001011   (b) 111101001011
(c) 101011101001   (d) 101011001001

81. A rectangle of l cm long and w cm wide is made 3 cm longer. The area has increased by
(a) $3\ lw$ (b) $3\ w$ (c) $3\ l$ (d) $3l + 3w + 9$

82. City X is 200 miles east of city Y and city Z is 150 miles north of city Y. What is the sortest distance between city X and Z.
(a) 507   (b) 175   (c) 250   (d) 300

Directions (83 - 85): Family A has an annual income of 200,000. Family B has an annual income of 500,000. Family C has an annual income of 1,000,000.
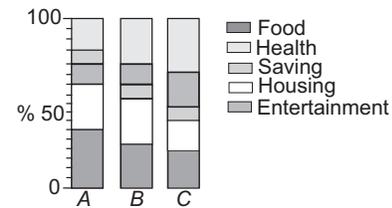
83. How does the per cent of total budget spent by Family A for health compare with the per cent of total budget spent by Family B for health ?
(a) Family A spent 200% more of its budget on health than did Family B.
(b) Family B spent 50% more of its budget on health than did Family A.
(c) The amount spent by the two families were unequal but the percentages of the totals were equal.
(d) Family B spent 5% less of its budget on health than did Family A.

84. What per cent of Family C's budget went for housing and entertainment ?
(a) 25%   (b) 50%   (c) 75%   (d) 33.13%

85. How does the food bill for Family A compare with the food bill of Family C ?
(a) Family A spent 2½ times as much as did Family C
(b) Family C spent 2½ times as much as did Family A
(c) Family C spent 1/2 as much for food as did Family A.
(d) Family A spent twice as much for food as Family C

Directions (86 - 90): Refer to the following graph.
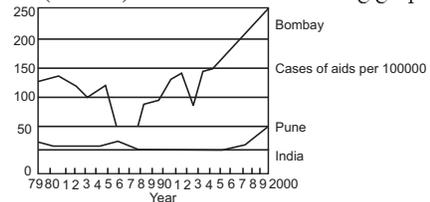
86. How many cases of Aids per 100,000 population were reported in Bombay 1989 ?
(a) 50   (b) 60   (c) 65   (d) 150

87. During what year there was the greatest difference between the cases per 100,000 of Aids in Pune and the rest of the country ?
(a) 1979   (b) 1990
(c) 2000   (d) 1997

88. When did Bombay experience Sharpest rise in Aids ?
(a) 1987-88   (b) 1999-2000   (c) 1992-93   (d) 1995-97

89. During which year Pune and India have the same number of Aids patients per 100,000?
(a) 1979   (b) 1986   (c) 1999   (d) 1992

90. In 2000 how many case of Adis per 1000 population was there in Pune ?
(a) 50   (b) 5   (c) 0.5   (d) 5.5

Directions (91-96): Ocean water plays an indispensable role in supporting life. The great ocean basins hold about 300 million cubic miles of water. From this vast amount, about 80,000 cubic miles of water are sucked into the atmosphere each year by evaporation and returned by precipitation and drainage to the ocean. More than 24,000 cubic miles of rain descend annually upon the continents. This vast amount is required to replenish the lakes and

streams, springs and water tables on which all flora and fauna are dependent. Thus, the hydrosphere permits organic existence.

The hydrosphere has strange characteristics because water has properties unlike those of any other liquid. One anomaly is that water upon freezing expands by about 9 per cent, whereas most liquids contract on cooling. For this reason, ice floats on water bodies instead of sinking to the bottom. If the ice sank, t h e hydro sphere wood soon be frozen solidly, except for a thin layer of surface melt water during the summer season Thus, all aquatic life would be destroyed and interchange of warm and cold currents, which moderates climate, would be notably absent.

Another outstanding characteristics of water is that water has a heat capacity which is the highest of all liquids and solids except ammonia. This characteristic enables the oceans to absorb and store vast quantities of heat, thereby often preventing climatic extremes. In addition, water dissolves more substances than any other liquid. It is this characteristic which helps make oceans a great storehouse for minerals which have been washed down the continents. In several areas of the world these minerals are being commercially extracted from the Dead Sea, and magnesium is produced from sea water along the American Gulf Coast.

91. The anthor's main purpose in this passage is to
(a) describe the properties and uses of water
(b) illustrate the importance of conserving water
(c) explain how water is used in commerce and industry
(d) compare water with other liquids

92. According to the passage, fish can survive in the oceans because
(a) they do not need oxygen
(b) ice floats
(c) evaporation and condensation create a water cycle
(d) there are currents in the oceans

93. Which of the following characteristics of water does the author mention in the passage ?
I. Water expands when it is frozen
II. Water is a good solvent
III. Water can absorb heat
(a) I only   (b) II only
(c) I and II only   (d) I, II and III

94. According to the passage, the hydrosphere is not
(a) responsible ror all forms of life
(b) able to modify weather
(c) a source of natural resources
(d) in danger of freezing over

95. The author's tone in the passage can beast be described as
(a) dogmatic   (b) dispassionate
(c) speculative (d) biased

96. The author organises the passage by
(a) comparison and contrast
(b) juxtaposition of true and untrue ideas
(c) general statements followed by examples
(d) hypothesis and proof

Direction (97 - 100): Observe the dilemma of the fungus: it is a plant, but it possesses no chlorophyll. While all other plants put the sun's energy to work for them combining the nutrients of ground and air into the body structure, the chlorophylless fungus must look elsewere for an energy supply. It finds it in those other plants which, having received their energy free from the sun, relinquish it at some point in their cycle either to animals (like us humans) or to fungi.

in this search for energy the fungus has become the earth's major source of rot and decay. Wherever you see mold forming on a piece of bread, or a pile of leaves turning to compost or a blown-down tree becoming pulp on the ground, you are watching a fungus eating. Without fungus action the earth would be piled high with the dead plant life of past centuries. In fact certain plants life of past centuries. In fact certain plants which contain resins that the toxic to fungi will last indefinitely; specimens of the redwood, for instance, can still be found resting on the forest floor centuries after having been blown down.

97. Which of the following words best describes the fungus as depicted in the passage ?
(a) Unevolved (b) Sporadic   (c) Enigmatic(d) Parasitic

98. The passage states all the following about fungi, except:
(a) They are responsibile for the decomposition of much plant life
(b) They cannot live completely apart from other plants.
(c) They are vastly different from other plants
(d) They are poisonous the resin-producing plants.

99. The author's statement that "you are watching a fungus eathing" is best described as
(a) figurative   (b) ironical
(c) parenthetical   (d) erroneous

100. The author is primarily concerned with
(a) warning people of the dangers of fungi
(b) writing a humorous essay on fungi
(c) relating how most plants use solar energy
(d) describing the actions of fungi