Question Booklet No. **52151**

NIMCET09

Question Booklet

NIMCET09 ROLL NO.							

Day & Date : Sunday, 17-05-2009 **Time : 10:00 a.m. to 12 noon**

This is to certify that NIMCET ROLL NO. has been correctly written and verified.

Candidate's Signature *Seal of the Centre* *Invigilator's Signature*

Instructions to the Candidate

1. The **Question Booklet with OMR Answer Sheet is issued** at the start of the examination.
2. Do not open the Question Booklet until the **"start opening"** signal is given. Candidates are required to verify that there are 120 questions in the Question Booklet.
3. Use of **calculators, cell phones and other electronic devices are not permitted** inside the Examination Hall.
4. Carefully read these instructions and those printed on OMR Answer Sheet and make correct entries in the OMR Answer Sheet. As OMR Answer Sheets are designed to suit the COMPUTERISED ASSESSMENT SYSTEM, special care should be taken to darken the correct bubble. Fill the ROLL NO. correctly.
5. Write your Question Booklet No. in the space given on your OMR Answer Sheet and darken the correct bubbles.
6. Choose the correct answer from out of the four available options given for each question.
7. For answering a question, fill the appropriate bubble in the OMR Answer Sheet completely like this by using **HB pencil only.** Ensure that for each question only one bubble is darkened.
8. Each correct answer shall be awarded four (4) marks. Each wrong answer carries one (1) negative mark.
9. Clarifications on questions are not permitted.
10. Rough work should be done only in the blank space provided in the Question Booklet. **Rough work should not be done anywhere on the OMR Answer Sheet.**
11. No candidate is allowed to leave the Examination Hall till examination is over.
12. Immediately after the prescribed examination time is over, the **OMR Answer Sheet** should be returned to the Invigilator Confirm that the Question Booklet and OMR Answer Sheet **bear the** signature of **yourself** and the **Invigilator** at **the appropriate places.**

MATHEMATICS

1. If $\theta = \tan^{-1}\frac{1}{1+2} + \tan^{-1}\frac{1}{1+(2)(3)} + \tan^{-1}\frac{1}{1+(3)(4)} + ... + \tan^{-1}\frac{1}{1+n(n+1)}$ than θ is equal to.

   (a) $\frac{n}{n+1}$ (b) $\frac{n+1}{n+2}$ (c) $\frac{n}{n+2}$ (d) $\frac{n-1}{n+2}$

2. If $(1+x-2x^2)^6 = 1+a_1x+a_2x^2 + ...+a_{12}x^{12}$, than the value of $a_2 + a_4 + a_6 + ...+ a_{12}$ is

   (a) 1024 (b) 64 (c) 32 (d) 31

3. A square with side 'a' is revolved about its centre through 45^o. What is the area common to both the squares.

   (a) $2(\sqrt{2}-1)a^2$ (b) $(\sqrt{2}+1)a^2/2$ (c) $(\sqrt{3}-1)a^2$ (d) $(\sqrt{5}-1)a^2$

4. A and B Throw a die in succession to win a bet with A starting first. Whoever throws '1'. First wins an amount of Rs. 110 what are the respective expectations of A and B ?

   (a) Rs. 70 and Rs. 40 (b) Rs. 60 and Rs. 50 (c) Rs. 75 and Rs. 35 (d) None of these

5. How many different paths in the xy-plane are there from (1,3) to (5,6), if a path proceeds one step at a time by going either one step to the right (R) or one step upward(U) ?

   (a) 35 (b) 40 (c) 45 (d) None of these

6. If the distance of any point (x,y) from the origin is defined as d(x, y) = max (|x|, |y|), then the locus of the point (x, y) where d(x, y) = 1 is.

   (a) a square of area 1 sq. unit
   (b) a circle of radius 1
   (c) a triangle
   (d) a square of area 4 sq. units.

7. If $\sin^{-1}x + \cos^{-1}(1-x) = \sin^{-1}(-x)$, then x satisfies the equation

   (a) $2x^2 - x + 2 = 0$ (b) $2x^2 - 3x = 0$ (c) $2x^2 + x - 1 = 0$ (d) None of these

8. A and B are independent witnesses in a case. The probability that A speaks the truth is 'x' and that B speaks the truth is 'y'. If A and B agree on a certain statement, the probability that the statement is true is.

   (a) $\frac{xy}{xy+(1-x)(1-y)}$ (b) $\frac{xy}{(1-x)(1-y)}$ (c) $\frac{(1-x)(1-y)}{xy+(1-x)(1-y)}$ (d) $\frac{(1-x)(1-y)}{xy}$

9. If A is a 3×3 matrix with det (A) = 3, then det (adj A) is

   (a) 3 (b) 9 (c) 27 (d) 6

10. A set contains (2n+1) elements. If the number of subsets which contain at most n elements is 4096, then the value of n is.

    (a) 28 (b) 21 (c) 15 (d) 6

11. The total number of relations that exist from the set A with m elements into the set AxA is.

    (a) m^2 (b) m^3 (c) m (d) None of these

12. Water runs into a conical tank of radius 5 feet and height 10 feet, at a constant rate of $2feet^3$/ minute. How fast is the water level rising when the water is 6 feet deep?

    (a) $\frac{2}{9}$ feet/min (b) $\frac{2}{9\pi}$ feet/min (c) $\frac{2\pi}{9}$ feet/min (d) $\frac{\pi}{9}$ feet/min

13. The probability that a man who is 85 yrs. Old will die before attaining the age of 90 is 1/3. A_1 A_2 A_3 and A_4 are four persons who are 85yrs. Old. The probability that A_1 will die before attaining the age of 90 and will be the first to die is.

(a) $\frac{65}{81}$ (b) $\frac{13}{81}$ (c) $\frac{65}{324}$ (d) $\frac{13}{108}$

14. An open top box is to be made out of a piece of cardboard measuring 6m x 6m by cutting off equal squares from the corners and turning up the sides. The height of the box for maximum volume is.

(a) 2m (b) 2.5m (c) 1.2 m (d) None of these

15. If $\hat{a}, \hat{b}$ and $\hat{c}$ are unit vectors, then $|\vec{a}-\vec{b}|^2+|\vec{b}-\vec{c}|^2+|\vec{c}-\vec{a}|^2$ does not exceed.

(a) 9 (b) 4 (c) 8 (d) 6

16. Let f(x) = $[x^2 - 3]$ where [ ] denotes the greatest integer function. Then, the number of points in the interval (1,2) where the function is discontinuous is

(a) 4 (b) 2 (c) 6 (d) None of these

17. If a + b + c $\neq 0$, then the system of equations

(b + c) (y + z) – ax = b – c

(c + a) (z + x) – by = c – a

(a + b) (x + y) – cz = a – b has

(a) a unique solution

(b) no solution

(c) infinite number of solutions

(d) finitely many solutions

18. If y = f(x) is an odd and differentiable function defined on $(-\infty,\infty)$ such that f' (3) = -2 then f' (-3) equals to.

(a) 4 (b) 2 (c) -2 (d) 0

19. The value of $\int_0^{\pi}\frac{x\sin x}{1+\cos^2 x}dx$ is

(a) $\pi^2/3$ (b) $\pi^2/4$ (c) $\pi^2/6$ (d) $\pi^2/2$

20. If $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$, then x is.

(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{1}{4}$

21. The equation $\sin^4 x + \cos^4 x + \sin 2x + \alpha = 0$ is solvable for

(a) $-\frac{1}{2}\le\alpha\le\frac{1}{2}$ (b) $-3\le\alpha\le 1$ (c) $-\frac{3}{2}\le\alpha\le\frac{1}{2}$ (d) $-1\le\alpha\le 1$

22. If x < - and $2^{|x+1|} - 2^x = |2^x - 1| + 1$ then the value of x is.

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

23. The vector $\vec{B} = 3\hat{i} + 4\hat{k}$ is to be written as the sum of a vector $\vec{B}_1$ parallel to $\vec{A} = \hat{i} + \hat{j}$ and a vector $\vec{B}_2$ perpendicular to $\vec{A}$, then $\vec{B}_1$ is.

(a) $\frac{3}{2}(\hat{i}+\hat{j})$ (b) $\frac{2}{3}(\hat{i}+\hat{j})$ (c) $\frac{1}{2}(\hat{i}+\hat{j})$ (d) None of these

24. Find the value of k in the equation $x^3 - 6x^2 + kx + 64 = 0$, if it is known that the roots of the equation are in geometric progression.
(a) 24 (b) 16 (c) -16 (d) -24

25. If $P = \{(4^n - 3n - 1)/n \in N\}$ and $Q = \{(9n-9)/n \in N\}$, then $P \cup Q$ is equal to.
(a) N (b) P (c) Q (d) None of these

26. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then $I + A + A^2 + \ldots\ldots\ldots\ldots \infty$ equals to
(a) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} -1 & -2 \\ -3 & -4 \end{bmatrix}$ (c) $\begin{bmatrix} \frac{1}{2} & -\frac{1}{3} \\ -\frac{1}{2} & 0 \end{bmatrix}$ (d) $\begin{bmatrix} -\frac{1}{4} & \frac{1}{3} \\ \frac{1}{2} & 0 \end{bmatrix}$

27. A man has 5 coins, two of which are double headed, one is double tailed and two are normal. He shuts his eyes, picks a coin at random, and tosses it. The probability that the lower face of the coin is a head is.
(a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{3}{5}$ (d) $\frac{4}{5}$

28. A_1 A_2, A_3 and A_4 are subsets of a set U containing 75 elements with the following properties. Each subset contains 28 elements the intersection of any two of the subsets contains 12 elements the intersection of any three of the subsets contains 5 elements. The intersection of all four subsets contains 1 element. The number of elements belonging to none of the four subsets is.
(a) 15 (b) 17 (c) 16 (d) 18

29. Let ABC be an isosceles triangle with AB = BC. If base BC is parallel to x-axis and m_1 m_2 are slopes of medians drawn through the angular points B and C, then.
(a) $m_1 m_2 = -1$ (b) $m_1 + m_2 = 0$
(c) $m_1 m_2 = 2$ (d) $(m_1-m_2)^2 + 2m_1m_2 = 0$

30. The smaller of the areas bound by $y = 2 - x$ and $x^2 + y^2 = 4$ is.
(a) $\pi - 1$ (b) $\pi - 2$ (c) $2\pi - 1$ (d) $2\pi - 2$

31. There are 10 points in a plane out of these 6 are collinear. The number of triangles formed by joining these points is.
(a) 100 (b) 120 (c) 150 (d) None of these

32. The number of distinct integral values of 'a' satisfying the equation $2^{2a} - 3\,(2^{a+2}) + 2^5 = 0$ is.
(a) 0 (b) 1 (c) 2 (d) 3

33. If $A = \cos^2\theta + \sin^4\theta$, then for all values of θ.
(a) $1 \le A \le 2$ (b) $\frac{13}{16} \le A \le 1$ (c) $\frac{3}{4} \le A \le \frac{13}{16}$ (d) $\frac{3}{4} \le A \le 1$

34. From 50 students taking examination in Mathematics, Physics and Chemistry, 37 passed Mathematics, 24 Physics and 43 Chemistry. At most 19 passed mathematics and Physics at most 29 Mathematics and Chemistry and at most 20 Physics and Chemistry. The largest possible number that could have passed all three examinations is.
(a) 10 (b) 12 (c) 9 (d) None of these

35. The number of solutions for $\tan^{-1}\sqrt{x(x+1)} + \sin^{-1}\sqrt{x^2 + x + 1} = \frac{\pi}{2}$ is
(a) zero (b) one (c) two (d) infinite

36. If $\vec{a},\vec{b},\vec{c}$ are non- coplanar unit vectors such that $\vec{a}\times(\vec{b}\times\vec{c})=\frac{\vec{b}+\vec{c}}{\sqrt{2}}$, then the angle between $\vec{a}$ and $\vec{b}$ is.

(a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{4}$ (c) $\frac{\pi}{2}$ (d) π

37. The straight lines $\frac{x}{a}-\frac{y}{b}=k$ and $\frac{x}{a}+\frac{y}{b}=\frac{1}{k}, k\neq 0$ meet on

(a) a parabola (b) an ellipse (c) a hyperbola (d) a circle

38. Let A and B be two events such that $P(\overline{A\cup B})=\frac{1}{6}, P(A\cap B)=\frac{1}{4}$ and $P(\overline{A})=\frac{1}{4}$ then events A and b are.

(a) Independent but not equally likely
(b) mutually exclusive and independent.
(c) equally likely and mutually exclusive.
(d) equally likely but not independent.

39. An anti aircraft gun can take a maximum of four shots at an enemy plane moving away from it. The probabilities of hitting the plane at first, second, third and fourth shot are 0.4, 0.3, 0.2 and 0.1 respectively. The probability that the gun hits the plane then is.

(a) 0.6972 (b) 0.6978 (c) 0.6976 (d) 0.6974

40. If $2x^4 + x^3 - 11x^2 + x + 2 = 0$, then the values of $x+\frac{1}{x}$ are

(a) -3, $\frac{5}{2}$ (b) $-\frac{1}{5},3$ (c) $\frac{2}{5},\frac{1}{3}$ (d) $\frac{1}{3},-5$

ANALYTICAL A BILITY AND LOGICAL REASONING

41. If all the 6's are replaced by 9's, then the algebraic sum of all the numbers from 1 to 100 (both inclusive), varies by.
(a) 330 (b) 333 (c) 219 (d) 279

42. Pick the 1^{st}, 2^{nd}, 4^{th} , 5^{th} and 6^{th} letters in the word REASONING, form yet another word and then write the first and last letters of the word formed.
(a) SE (b) ES (c) NE (d) OR

43. The sum of the numbers from 1 to 100, which are not divisible by 3 and 5. is
(a) 2946 (b) 2732 (c) 2632 (d) 2317

44. While Hameed had his back turned a dog ran into his butcher shop, snatched a piece of meat off the counter and ran out, Hameed was mad when he realized what had happened. He asked other shopkeepers, who had seen the dog, to describe it. The shopkeepers, really did not want to help hameed. So each of them made a statement which contained one truth and one lie.
Shopkeeper 1 said : "The dog had black hair and a long tail"
Shopkeeper 2 said : "The dog had a short tail and wore a collar".
Shopkeeper 3 said : "The dog had white hair and no collar".
Based on the above statement which of the following could be correct description The dog had.
(a) White hair, Short tail and no collar (b) White hair, long tail and a collar
(c) Black hair, long tail, and a collar (d) black hair, long tail and no collar

45. A train after traveling 60 km meets with an accident and then proceeds at $\frac{3}{4}$ of its former rate and arrives at the terminus 40 minutes late. Had the accident happened 25 km further on, it would have arrived 10 minutes sooner, Find the speed of the train and the distance respectively.
(a) 160 km/ hr, 150 km (b) 160 km/ hr, 140 km (c) 50 km/ hr, 160 km (d) 40 km/hr, 160 km

46. The remainder when
X = 1! + 2! + 3! + ……..+ 100! Is divided by 240 is.
(a) 153 (b) 33 (c) 73 (d) 187

47. Find the unit digit of $(13687)^{3265}$
(a) 1 (b) 3 (c) 7 (d) 9

48. Arrange the following statements P, Q, R, And S in a logical order to make a sensible paragraph:
P: The logic that underlines this is two-fold.
Q: RBI is likely to cut bank rate and CRR.
R: Over the last few years, RBI has tried to implement policy changes.
S: According to sources, bank rate will be out in April.
(a) QRPS (b) RPSQ (c) QSRP (d) SPQR

49. Computer A takes 3 minutes to process an input while computer B takes 5 minutes. If computers A, B and C can process an average of 14 inputs in one hour, how many minutes does computer C alone take to process one input?
(a) 10 (b) 4 (c) 6 (d) None of these

50. find the value of 'x', if:
$\left(\frac{1}{2^{\log\times 4}}\right)\left(\frac{1}{2^{\log\times 16}}\right)\left(\frac{1}{2^{\log\times 256}}\right).....\propto = 2$

(a) 2 (b) $\frac{1}{2}$ (c) 4 (d) $\frac{1}{4}$

Read the following passage to answer the questions from 51 to 54.

In each question below are given three statements followed by three conclusions numbered I, II and III. You have to take the three given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusions logically follow (s) from the given statements disregarding commonly known facts. Then decide which of the answers (A), (B), (C) And (D) is the correct answer.

51. Statements:

All jewels are rings.
Some rings are necklaces
Some cakes are jewels.

Conclusion:

1. Some necklaces are jewels.
2. Some rings are cakes.
3. No jewel is necklace

(a) Only II and either I or III follow (b) Only either I or III follows
(c) Only II and III follow (d) Only II follows.

52. Statements:

All actors are writers.
Some writers are dancers.
All poets are writers.

Conclusions:

1. All actors are poets.
2. Some dancers are writers.
3. Some dancers are actors.

(1) None follows (2) Only I and II follow
(3) Only II and III follow (4) Only I and III follow

53. Statements:

Some trees are branches.
All buds are branches.
All flowers are trees.

Conclusion:

1. Some Branches are buds.
2. Some trees are flowers
3. Some buds are trees.

(a) Only I follows (b) Only II follows (c) Only I and II follow (d) All follow

54. Statements:

Some pots are eatables.
All eatables are drinks.
No banana is pot.

Conclusions:

1. Some pots are drinks
2. All eatables are pots.
3. Some drinks are eatables.

(a) Only I follow (b) Only III follows
(c) Only II follows (d) Only I and III follow

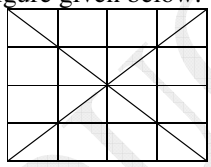
55. How many 5s are there in the following number series each of which is immediately followed by 4 but not immediately preceded by 6?
456 656 455 455 654 456 456 5454
(a) one (b) Three (c) Four (d) Two

56. You are in the land of logic where there are 3 types of rabbits. Blue rabbits always tell the truth, green rabbits sometimes tell the truth and red rabbits never tell the truth. Assume you cannot distinguish colours. A rabbit says to you " I always lie". What colour of rabbit is speaking to you.
(a) Blue (b) Red (c) Green (d) cannot be concluded

57. How many pairs of letters are there in the word 'PRISON', each of which has as many letters between its two letters in the word as there are between them in the English alphabet ?
(a) Two (b) One (c) Four (d) Three

58. If $A_1 = \{3\}$, $A_2 = \{5, 7, 9\}$, $A_3 = \{11,13,15,17,19\}$, $A_4 = \{21, 23, 25, 27, 29, 31, 33\}$ and so on, what is the average of the numbers of the set A_{20} ?
(a) 761 (b) 763 (c) 765 (d) 767

59. Identify the number of triangles in the figure given below.



(a) 44 (b) 48 (c) 36 (d) 32

60. Reena visited her High School friend, Natasha after their 25th school reunion, "What a nice pair of children you have, are they twins?", Reena asked.
"No my sister is older than I", said Natasha's son Rahul, "The square of my age plus the cube of her age is 7148".
"The square of my age plus the cube of his age is 5274", said Preeti, Natasha's daughter.
How old are they?
(a) Preeti 23 Rahul 14 (b) Preeti 18 Rahul 16 (c) Preeti 21 Rahul 19 (d) Preeti 19 Rahul 17

Passasge for Questions: 61 – 65.

Five houses lettered A, B, C, D & E are built in a row next to each other. The houses are lined up in the order A, B, C, D & E. Each of the five houses have coloured roofs and chimneys. The roof and chimney of each house must be painted as follows:

1. The roof must be painted either green, red, or yellow.
2. The chimney must be painted either white, black, or red.
3. No house may have the same colour chimney as the colour of roof.
4. No house may use any of the same colours that the every next house uses.
5. House E has a green roof.
6. House B has a red roof and a black chimney.

61. What is maximum total number of green roofs for houses.
(a) 1 (b) 2 (c) 3 (d) 4

62. If house C has a yellow roof, which one of the following is true?
(a) House E has a white chimney (b) House E has a has a black chimney.

(c) House E has a red chimney (d) House D has a red chimney

63. which of the following is true ?
(a) At least two houses have black chimneys (b) At least two houses have red roofs.
(c) At least two houses have white chimneys. (d) At least two houses have green roofs.

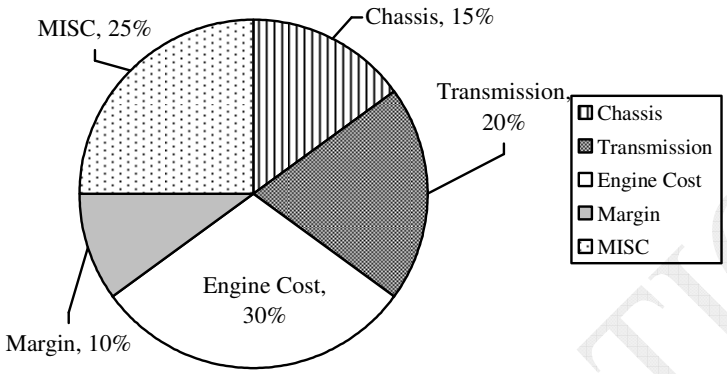
64. Which statement if false ?
(a) House A has a yellow roof. (b) House A & C have different colour chimneys.
(c) House D has a black chimney (d) House E has a white chimney.

65. Which possible combinations of roof & chimney can a house have ?
1- A red roof & a black chimney.
2- A yellow roof & a red chimney.
3- A yellow roof & a black chimney.
(a) I & II & III (b) II only (c) III Only (d) I & II Only

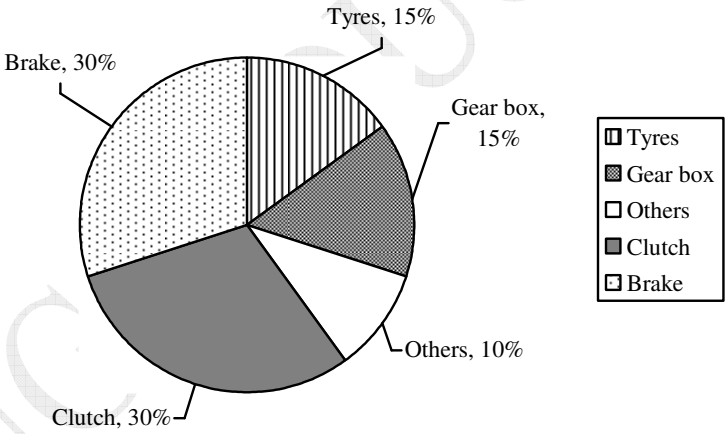
66. Cars are safer than planes. Fifty percent of plane accidents result in death, while only one percent of car accidents result in death. Which of the following, If true, would most seriously weaken the argument above ?
(a) Planes are inspected more often than cars.
(b) The number of car accidents is several hundred thousand times higher than the number of plane accidents.
(c) Pilots never fly under the influence of alcohol, while car drivers often do.
(d) Plane accidents are usually the fault of air traffic controllers, not or pilots.

Directions for questions 67 to 71: Study the pie charts given below and answer the following questions:

Sale Price break - up of a car



Cost break - up of transmission



Price of car = Rs. 1,00,000

67. If transmission cost increases by 20% by what amount is the profit reduced (total price of car remains same) ?
(a) Rs. 3,000 (b) Rs. 4,000
(c) Rs. 6,000 (d) can not be determined

68. If transmission cost increases by 10% and engine cost increases by 20% what is the percentage contribution of transmission cost with respect to the total cost ?
(a) 20% (b) 22.44% (c) 21.86 (d) 21.98%

69. What is the profit percentage ?
(a) 10% (b) 9.09%

(c) 11.11% (d) can not be determined

70. If all the costs increase by 10% and the selling price remains the same, by what percent will the profit be reduced ?
(a) 50% (b) 90%
(c) 10% (d) can not be determined

71. If the price of tyres goes up by 25% by what amount should the sale price be increased to maintain the amount of profit?
(a) Rs. 750 (b) Rs. 2,250 (c) Rs. 3,750 (d) 375

72. Bala had three sons. He had some chocolates which he distributed among them. To his eldest son, he gave 3 chocolates more than half the number of chocolates with him. To his second eldest son he gave 4 chocolates more than one third of the remaining number of chocolates with him. To his youngest son he gave 4 chocolates more than one fourth of the remaining number of chocolates with him. He was left with 11 chocolates. How many chocolates did he initially have ?
(a) 180 (b) 78 (c) 144 (d) 120

73. Twelve villages in a district are divided into 3 zones with 4 villages per each zone. The telephone department of the district intends to connect the villages with telephone lines such that every two villages in the same zone are connected with three direct lines and every two villages belonging to different zones are connected with two direct lines. How many direct lines are required ?
(a) 210 (b) 96 (c) 54 (d) 150

74 A teacher gave a student the task of adding 'N' natural numbers starting from 1. After a while, the student reported his result as 700. The teacher replied that his result was wrong. The student realized that he had added one number twice by mistake. Find the sum of the digits of the number which the student had added twice.
(a) 5 (b) 6 (c) 7 (d) 8

75. Using the digits 1,5,2,8 all possible four digit numbers are formed and the sum of all such numbers is between.
(a) 10000 & 20000 (b) 20000 & 50000 (c) 50000 & 100000 (d) 100000 & 150000

76. How long would it take you to count 1 billion orally if you could count 200 every minute and were given a day off every four years? Assume that you start counting on 1 January 2001.
(a) 10 years, 107 days, 5 hours, 20 minutes
(b) 8 years, 287 days, 15 hours, 40 minutes
(c) 9 years, 187 days, 5 hours, 20 minutes
(d) 9 years, 278 days, 12 hours, 34 minutes

77. A motorboat going downstream a river passes a raft (freely floating with the river current) at a certain point 'A' Exactly one hour later it turned back and after some time while coming upstream it passed the same raft at a point 'B' situated at a distance of 6 km from point 'A' what is the speed of the water current in the river expressed in km /hr.
(a) 2.0 (b) 3.0 (c) 4.0 (d) 6.0

Read the following passage to answer the questions from 78-80.

Rajita has unique way of attempting the question paper having 50 question. She starts from question 1 and attempts all questions which are in A.P. with a common difference of 3 in the forward direction and 3 in reverse direction. If she reaches a stage when she cannot attempt any more question, she starts in the reverse direction with the first unanswered question. She repeats the same process and when she reaches a stage when she can not process any further, she reverses her direction again starting with the first unanswered question.

78. Which is the last question that she answers if she attempts all the 50 questions ?
(a) 50 (b) 49 (c) 48 (d) 3

79. Which is the 20th question Rajita answers ?
(a) 50 (b) 48 (c) 47 (d) 44

80. How many times does she reverse her direction ?
(a) 3 (b) 4 (c) 5 (d) 6

Directions for question 81: Choose the ordered pair of statements (P to S) where the first statement implies the second, and two statements are logically consistent with the main statement.

81. Each time Sachin is the captain India loses.
(P) Sachin is the captain (Q) India did not win (R) Sachin is not the captain (S) Indian Won
(a) PS (b) Sr (c) SP (d) RP

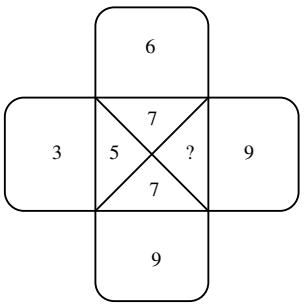
82. All the letters of the work 'INDIA' are permuted in all possible ways and the words so formed are written as in dictionary then the 58th word in the list is.
(a) NIIDA (b) INIDA (c) NIDIA (d) NIDAI

83. You have 13 balls which all look identical. All the balls are of the same weight except for one. Using only a balance scale. You can find the odd one out with how many minimum number of weighing?
(a) 3 (b) 5 (c) 6 (d) 4

84. Sum of all three digit numbers (no digit being zero) having the property that all digits are perfect squares is.
(a) 3108 (b) 6216 (c) 13986 (d) None of these

85. It is wrong for doctor to lie about their patients illnesses? Aren't doctors just like any other people we hire to do a job for us ? Surely, we would not tolerate not being told the truth about the condition of our automobile from the mechanic we hired to fix it, or the condition of our roof from the carpenter we employed to repair it. Just as these workers would be guilty of violating their good faith contracts with us if they were to do this, doctors who lie to their patients about their illnesses violate these contracts as well, and this is clearly wrong.
The conclusion of the argument is best expressed by which of the following?
(a) Doctors who lie to their patients about their illnesses violate their good faith contracts with their patients.
(b) Doctors often lie to their patients about their illnesses.
(c) It is wrong for doctors to lie about their patients' illnesses.
(d) Doctors, like mechanics and carpenters enter into good faith contracts with us when we hire them.

86. Which number will be there in the place of question mark (/) in the following figure.



(a) 5 (b) 6 (c) 4 (d) 8

87. If A + B = C + D, B + D = 2A,, D + E > A + B, C + D > A + E, then which of the following is true ?
(a) D > B > E > A > C (b) A > B > D > E > C (c) A > D > B > E > C (d) D > A > B > E > C

88. What will come in place of the question mark (?) in the following series ? 12 22 69 272 1365?
(a) 8196 (b) 8195 (c) 6830 (d) 8184

89. Recently, while in Bangalore, I decided to walk down the escalator of a tube station I did some quick calculation in my mind. I found that if I walk down twenty six steps, I require thirty seconds to reach the bottom. However, if am able to step down thirty four stairs I would only require eighteen seconds to get to the bottom. If the time is measured from the moment the top step begins to descend to the time I step off the last step at the bottom, what is the height of the stairway in steps ?
(a) 40 (b) 46 (c) 52 (d) 58

90. Divide Rs. 1074 (in whole Rs. Having incremental amounts) into a number of bags so that I can ask for any amount between Rs. 1 and Rs. 1074, and you can give me the proper amount by selecting a certain number of these bags without opening them. What is the minimum number of bags you will require ?
(a) 12 (b) 10 (c) 9 (d) 11

Read the following information carefully to answer the question from 91 to 94.

After months of talent searching for an administrative assistant to the president of the college the field of applicants had been narrowed down to five (A, B, C, D and E). It was announced that the finalist would be chosen after a series of all day group personal interviews. The examining committee agreed upon the following procedure.

1- The interviews will be held once a week.
2- Three candidates will appear at any all day interview session.
3- Each candidate will appear at least once.
4- If it becomes necessary to call applicants for additional interviews, no more than one such applicant should be asked to appear the next week.
5- Because of a detail given in the written applications, it was agreed that whenever candidate B appears, A should also be present.
6- Because of travel difficulties, it was agreed that C will appear for only one interview.

91. If A, B and D appear at the interview and D is called for an additional interview the following week, which two candidates may be asked to appear with D?
1. A 2. B 3. C 4. E
(a) I and II only (b) III and IV only (c) II and III only (d) II and IV only

92. Which of the following is a possible sequence of combinations for interviews in two successive weeks?
(a) ABC; BDE (b) ABD; ABE (c) ADE; ABC (d) BDE; ACD

93. Which of the following correctly state (s) the procedure followed by the search committee ?
1- After the second interview, all applicants might have appeared at least once.
2- The committee interviews each applicant a second time.
3- If a third session is held, it is possible for all applicants to appear at least twice.
(a) I only (b) II only (c) I and II only (d) III only

94. At the first interview, the following candidates appear: A, B, and D. Which of the following combinations can be called for the interview to be held the next week ?
(a) BCD (b) CDE (c) ABE (d) ABC

95. When you reverse the digits of the number 13, the number increases by 18. How many other two digit numbers increase by 18 when their digits are reversed?
(a) 5 (b) 6 (c) 7 (d) 8

COMPUTER AWARENESS

96. In the virtual memory system, the address space specified by address lines of the CPU must be than……. the physical memory size and…….. than the secondary storage size.
(a) Smaller, smaller (b) smaller, larger (c) larger smaller (d) larger, larger

97. To change upper case to the lower case letter in ASCII, correct mask and operation should be:
(a) 0100000 and NOR (b) 0100000 and NAND. (c) 0100000 and OR. (d) None of these

98. The switching expression corresponding to f(A, B, C, D) = $\Sigma(1,4,5,9,11,12)$ is:
(a) $B\overline{C}\overline{D} + \overline{A}\overline{C}D + A\overline{B}D$ (b) $A\,B\,\overline{C} + A\,C\,D + \overline{B}\,\overline{C}\,D$
(c) $A\,C\,\overline{D} + \overline{A}\,B\,\overline{C} + A\,\overline{C}\,\overline{D}$ (d) $\overline{A}\,B\,C + A\,C\,\overline{D} + B\,C\,\overline{D}$

99. Assuming all numbers are in 2's complement representation, which of the following numbers is divisible by 11111011 ?
(a) 11100100 (b) 11010111 (c) 11011011 (d) 00000110

100. Why is the width of a data bus so important to the processing speed of a computer ?
(a) The narrower it is, the greater the computer's processing speed.
(b) The wider it is, the more data can fit into the main memory.
(c) The wider it is, the greater the computer's processing speed.
(d) The wider it is, the slower the computer's processing speed.

101. A computer with a 32 bit word size uses 2's complement to represent numbers. The range of integers that can be represented by this computer is.
(a) -2^{32} to 2^{32} (b) -2^{31} to 2^{32} (C) -2^{31} to $2^{31}-1$ (d) -2^{32} to 2^{31}

102. On receiving an interrupt from an I/O device, the CPUs.
(a) hand over the control of address and data bus to interrupting device.
(b) Branch off to interrupt service subroutine immediately.
(c) branch off to interrupt service subroutine after completion of current instruction.
(d) none of the above.

103. A switching circuit that produces one in a set of input bits as an output based on the control value of control bits is termed as.
(a) Full adder (b) Inverter (c) Multiplexer (d) converter

104. Index register in a digital computer is used for
(a) pointing to the stack address.
(b) indirect addressing.
(c) keeping track the number of times loop is executed
(d) address modification.

105. Micro programmed control unit is.
(a) faster than hard wired unit.
(b) slower than hard wired unit.
(c) to facilitate easy implementation of new instructions.
(d) both (b) and (c)

General English

106. If some one is "gung ho" then he/ she is:
(a) stupid (b) childish (c) enthusiastic (d) loud

107. The pleasures of the table are never of consequence to one naturally abstemious. The word abstemious can be replace by:
(a) indulgent (b) temperate (d) discreet (e) profligate

108. A sentence has been given in active (or passive) voice. Out of the four alternatives select the one which best expresses the same sentence in passive (or active) voice. I know him.
(a) He has been known by me (b) He was known to me.
(c) He is Known by me. (d) He is known to me.

109. Which of the underlined parts in the sentence given below is a mistake which may need to be deleted or modified.
He can be able to pass the test in flying colours without any difficulties whatsoever.
(a) be able (b) flying colours (c) difficulties (d) whatsoever

110. The following passage consists of six sentences. The first sentence (S_1) is given in the beginning. The final sentence (S_6) is given in the last. The middle four sentences are jumbled up and labeled as P,Q,R and S. You are required to find out the proper sequence of the four sentences and mark accordingly.
S_1: Unlike many modern thinkers, Tagore had no blueprint for the world's salvation.
P: His thought will therefore never be out of date.
Q: He merely emphasized certain basic truths which men may ignore only at their peril.
R: He be lived in no particular 'ism'
S: He was what GandhiJi rightly termed the great sentinel.
S_6: As a poet he will always delight, as a singer he will always enchant, as a teacher he will always enlighten.
The proper sequence should be:
(a) SRPQ (b) PRQS (c) RSPQ (d) RQPS

111. Select the set of words that best fits the meaning of the sentence as a whole. While the disease is in _____ state it is almost impossible to determine its existence by _____.
(a) a dormant, postulate (b) a critical, examination
(c) a cute, analysis (d) a latent, observation

Read the passage and select the most suitable answer to questions 112 and 113 from the given choices:

The fossil remains of the first flying vertebrates, the pterosaurs, have intrigued paleontologists for more than two centuries. How such large creatures, which weighted in some cases as much as a piloted hang glider and had wingspans from 8 to 12 meters. Solved the problems of powered flight, and exactly what these creatures were reptiles or birds are among the questions scientists have puzzled over.

Perhaps the least controversial assertion about the pterosaurs is that they were reptiles. Their skulls, pelvises, and hind feet are reptilian. The anatomy of their wings suggests that they did not evolve into the class of birds. In pterosaurs a greatly elongated fourth finger of each forelimb supported a wing like membrane. The other fingers were short and reptilian, with sharp claws. In birds the second fingure is the principle strut of the wing, which consists primarily of feathers. If the pterosaur walked or remained stationary, the fourth finger, and with it the wing, could only turn upward in an extended inverted V-shape along side of the animal's body.

The pterosaurs resembled both birds and bats in their overall structure and proportions. This is not surprising because the design of any flying vertebrate is subject to aerodynamic constraints. Both the

pterosaurs and the birds have hollow bones, a feature that represents a saving in weight. In the birds, however, these bones are reinforced more massively by internal struts.

112. According to the passage the skeleton of pterosaurs can be distinguished from that of a bird by the.
(a) The size of its wingspan.
(b) Presence of hollow spaces in its bones.
(c) anatomic origin of its wing strut.
(d) Presence of hook like projections on its hind feet.

113. It can be inferred from the passage that the scientists now generally agree that:
(a) Enormous wingspan of the pterosaurs enable them to fly great distances.
(b) structure of the skeleton of the pterosaurs suggests a close evolutionary relationship to bats.
(c) Fossil remains of the pterosaurs reveal how they solved the problem of powered flight.
(d) pterosaurs were reptiles.

114. Identify the correct sentence.
(a) I have difficulty in remembering people's names.
(b) I get difficulty in remembering people's names.
(c) I have difficulty on remembering people's names.
(d) I am getting difficulty remembering people's names.

115. Fill in the blank:
I could not _____ him to attend the meeting.
(a) prevail over (b) prevail upon (c) prevail about (d) prevail in

116. For the word "QUIBBLE" find the most appropriate meaning from the alternatives given below:
(a) Agreement (b) Appreciation (c) Creation (d) Complain

117. The idiom 'I will be a monkey's uncle means.
(a) to want to keep a monkey
(b) that I have been enlightened
(c) that I have been fooled
(d) to express disbelief

118. Find the antonym of the word "DISPARAGE".
(a) Degrade (b) Improve (c) scatter (d) applaud

119. Choose the pair of words which exhibits the same relationship between each other as the given pair of words.
WRITING : PLAGIARISM
(a) confidence : deception
(b) money: misappropriation
(c) gold : theft
(d) germ: disease

120. Choose the word which can be used to replace the underlined word, in both the sentences.
1- It is certainly a <u>thing</u> which tempts people.
2- I <u>take exception</u> to what he has just said.
(a) object (b) protest (c) issue (d) prototype