Read the following passage and answer the questions 1 to 5

Anthropologists have pieced together the little they know about the history of left - handedness and right - handedness from indirect evidence. Though early men and women did not leave written records, they did leave tools, bones, and pictures. Stone Age hand axes and hatchets were made from stones that were carefully chipped away to form sharp cutting edges. In some. the pattern of chipping shows that these tools and weapons were made by right handed people. designed to fit comfortably into a right hand. Other Stone Age implements were made by or for left-handers Prehistoric pictures. painted on the walls of caves. provide further clues to the handedness of ancient people. A right - hander finds it easier to draw faces of people and animals facing toward the left. whereas a left - hander finds it easier to draw faces facing toward the right. Both kinds of faces have been found in ancient painting. On the whole. the evidence seems to indicate that prehistoric people were either ambidextrous or about equally likely to be left - or right - handed. But, in the Bronze Age. the picture changed. The tools and weapons found from that period are mostly made for right - handed use. The predominance of right - handedness among humans today had apparently already been established.

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1. What is the indirect evidence through which the preferred handedness of the Stone Age People could be understood ?
   (A) Petrified forms of vegetation
   (B) Patterns of stone chipping
   (C) Fossilized waste material
   (D) Fossilized footprints

2. According to the passage, a person who is right - handed is more likely to draw people and animals that are facing
   (A) upward
   (B) downward
   (C) toward the right
   (D) toward the left

3. What does the words "the picture" refer to which of the following?
   (A) Faces of animals and people
   (B) People's view from inside a cave
   (C) People's tendency to work with either hand
   (D) The kinds of paint used on cave walls

4. The author implies that which of the following developments occurred around the time of the Bronze Age
   (A) The establishment of written records
   (B) A change in the styles of cave painting
   (C) An increase in human skill in the handling of tools
   (D) The prevalence of right handedness

5. What is the main ides conveyed through the passage ?
   (A) The purpose of ancient implements
   (B) The significance of prehistoric cave paintings
   (C) The development of right - handedness and left – handedness
   (D) The pattern of chipping ancient tools

6. Which of the following refers to the idiom "under the sun" ?
   (A) Anything and everything (B) A large number of things
   (C) A few things (D) Something

7. Choose a phrasal verb to replace the explanation in brackets :
   When we arrive at the station, we (descend from) _____ the train
   (A) get down (B) stand down (C) get off (D) stand out

8. choose the suitable word from the following and fill in the blank :
   The medal was awarded for the student's _____ conduct and courage.
   (A) non receptive (B) exemplary (C) unreliable (D) disputable

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9. Which of following is a correctly spelt word ?
   (A) Hiderence (B) Hindrence (C) Hindarrence (D) Hindrance

10. Which of the following statement is grammatically correct ?
(A) The earth revolves round the Sun
(B) I have not seen him since four years.
(C) She met an one – eyed man
(D) One of the books borrowed by the students are famous.

11. Choose the set words from among the alternatives given. Which when inserted in the sentence best suit the meaning of the sentence.
The _____ of evidence was on the side of plaintif since all but one witness testify his story was _____.
(A) paucity, accurate (B) prosperity, far fetched
(C) prepondenerance, correct (D) accuracy, insufficient

12. Choose the one which is nearest in meaning to the word "TURN UP" ?
(A) Show up (B) Come up (C) Land up (D) Crop up

13. The phrase "Ready to believe" means
(A) Credulous (B) Creditable (C) Credible (D) Ineredible

14. Choose the appropriate word from among the choice to fill in the blank in sentence :
"If you drink to much, it will _____ your judgement"
(A) impair (B) impede (C) impose (D) impel

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15. Choose the set of words for each blank that best fits the meaning of the following sentence as a whole :
_____ green and black tea are obtained from the same plant, there are quite a few significant difference _____ them.
(A) Since, among (B) Howeve, in
(C) Though, between (D) Because, across

16. Choose the correct alternative which can be substituted for the given word/sentence
A person who travels to a sacred place as an act of religious devoation.
(A) Hermit (B) pilgrim (C) Saint (D) Medicant

17. Pick out the most effective word from the given words to fill in the blanks to make the sentence meaningfully complete :
Some people _____ themselves into believing that they are indispensable to the organization they work for.
(A) keep (B) fool (C) delude (D) denigrate

18. Fill in the blanks with appropriate phrase to make the sentence meaningfully complete.
_____ bad weather, the trip will be postponed to next week.
(A) In case (B) In case of (C) In case to (D) In case from

19. In the following sentence, choose the most suitable one word for the expression :
"A book containing summarized information on all branches of knowledge"
(A) Dictionary (B) Anthology (C)Encyclopedia (D) Directory

20. Pick out the most effective word from the given words to fill in the blanks to make the sentence meaningful completely :
The man was about to move his bike into the compound of his apartment when a passer by _____ down the motor cycle
(A) forced (B) Fell (C) turned (D) knocked

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21. Which one of the following boolean algebraic rule is correct ?
(A) A . A' = 1 (B) A + AB = A + B (C) A + A'B = A + B (D) A(A + B) = B

22. The representation of a floating point binary number +1001.11 in 8 bit fraction and 6-bit exponent format is
(A) Fraction : 01001110 exponent : 000100
(B) Fraction : 00001001 exponent : 000011
(C) Fraction : 10010000 exponent : 110000
(D) Fraction : 00100100 exponent : 011000

23. Which term is redundant in the expression AB + A'C + BC ?
(A) BC (B) A'C (C) AB (D) None of these

24. Let the memory access time is 10 miliseconds and cache hit ratio 15% The effective memory access time is
(A) 2 miliseconds (B) 1.5 miliseconds
(C) 1.85 microseconds (D) 1.85 miliseconds

25. Which of the following is the representation of decimal number (- 147) in 2's compliment notation on a 12-bit machine ?
(A) 111101101100 (B) 110001001101 (C) 111101101101 (D) 000001101101

26. The first instruction of bootstrap loader program of an operating system is stored in
(A) RAM (B) Hard disk (C) BIOS (D) None of these

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27. Consider the equation $(40)_x = (132)_y$ is some bases x and y. Then a possible set of value of x and y are
(A) 8 and 12 (B) 12 and 8 (C) 6 and 12 (D) 12 and 6

28. The smallest intger that can be represented by an 8-bit number in 2's complement form is
(A) - 256 (B) - 128 (C) -127 (D) -255

29. Which of the following in a functionally complete set of gates ?
I. NAND II. NOR
(A) I but not II (B) II but not I (C) Neither I nor II (D) Both I and II

30. The total number binary function that can be defined using n boollean variables is
(A) 2^{n-1} (B) 2^n (C) 2^{n+1} (D) None of these

31. Two persons S and M have made the following statements among themselves.
- S says that I am certainly not over 40 years.
- M says that I am 38 years and you are at least 5 year older than me.
- S says you are at least 39 years.

If all the above statements are wrong, what are the ages of M and S ?
(A) 36 and 40 (B) 36 and 41
(C) 37 and 40 (D) Cannot be determined

32. what is the largest number of positive integers to be picked up randomly so that the sum of difference of any two of the chosen numbers is divisible by 10 ?
(A) 2 (B) 5 (C) 7 (D) 10

33. Five children were administered psychological tests to know their intellectual levels. In the report psychologists pointed that child A is less intelligent than child B. The child C is less intelligent child D. The child B is less intelligent than child C and child A is less intelligent than child E. Which child is most intelligent ?
(A) D only (B) E only
(C) D or E (D) Neither D nor E

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34. From a group of 7 men and 6 women, a committee of 5 persons with more males than females is to be formed. In how many ways can this be done ?
(A) 564 (B) 645 (C) 735 (D) 756

35. A, B, C, D, E are 7 group of friends from a club. There are two houses wives, one lecturer, one architect, one accountant and one lawyer in the group. There are two married couples. The lawyer is married to D, who is a house wife. No lady is either an architect or an accountant. C, the accountant is married to F, who is lecturer. If E is not a house wife, what is the profession of E ?
(A) Lawyer (B) Architect (C) Lecturer (D) Accountant

36. There are five books A, B, C, D and E placed on a table. If A is placed below E, C is placed above D, B is placed below A and D is placed above E, then which of the following books touches the surface of the table.
(A) C (B) B (C) A (D) E

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37. The following series is obtained by considering representations of decimal 99 in different number system. The next two numbers in the sequence are
99, 90, 83, 78, ____, _____
(A) 71, 69 (B) 69, 57 (C) 67, 59 (D) 69, 63

Questions 38 to 40 are based on the following :

- In a family of six person A, B, C, D, E and F, there are two married couples.
- D is the grandmother of A and mother of B
- C is wife of B and mother of F
- F is granddaughter of E

38. Who is C to A ?
(A) Daughter (B) Mother
(C) Father (D) Cannot be determined

39. Which of the following is true ?
(A) A is brother of F (B) A is sister of F
(C) B has two daughters (D) None of these

40. Who among the following is one of the couples ?
(A) CD (B) DE (C) EB (D) None of these

41. The missing number in the following series 336, 210, 120, 60, ____, 6 is
(A) 24 (B) 30 (C) 34 (D) 40

42. If the day after in the day tomorrow is three days before Friday, then today is
(A) Tuesday (B) Thursday (C) Saturday (D) Monday

43. Find the missing term of the following series :
DCXW, HGTS,..... , POLK, TSHG
(A) KLOP (B) LKOP (C) KLPO (D) LKPO

44. Four passengers in a train find that they form an interesting group. Two of them are lawyers and the other two are doctors. Two of them speak Bengali and the other two speak Hindi and no two of the same profession speak the same language. They also found that two of them are Christians and two are Muslims and no two of the same religion speak the same languages. The Hindi speaking doctor is a Christian. Then which of the following statement logically follows ?
(A) The Bengali speaking lawyer is a Muslim
(B) The Christian lawyers speaks Bengali
(C) The Bengali speaking doctor is a Christian
(D) The Bengali speaking doctor is a Muslim

Question 45 to 47 are based on the following :

In an amusement park seven friends – Feroz, Gautam, Harish, Javed, Kumar, Laxman and Mohan are deciding who will ride the roller coaster. There is time for only one ride before the park closes.

- If Feroz rides Gautam must ride.
- If Gautam and Harish both ride, Javed cannot ride.
- If Harish and Javed both ride, Laxman cannot ride.
- If Javed rides, either Kumar or Mohan must ride.
- Kumar and Laxman cannot both ride, but one of them must ride.
- Kumar and Mohan cannot both ride

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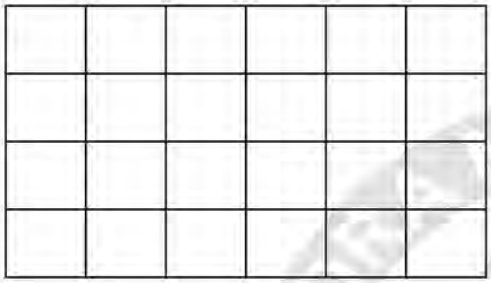
45. Which of the following is an acceptable combination of riders if only three people ride ?
(A) Harish, Javed and Laxman
(B) harish, Javed and Kumar
(C) Feroz, Gautam and Javed
(D) Gautam, Kumar and Laxman

46. If Javed and Mohan both ride, which of the following is true ?
(A) Gautam cannot ride
(B) Harish must ride
(C) Feroz cannot ride
(D) Laxman must ride

47. If Feroz and Harish both ride, what is the greatest number of people who can ride ?
(A) 5 (B) 7 (C) 4 (D) 6

48. The number of squares in the following 4 × 6 grid is



(A) 36 (B) 44 (C) 51 (D) 54

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49. A cube is made up of 125 one cm. square cubes placed on a table. How many squares are visible only on three sides ?
(A) 4 (B) 8 (C) 12 (D) 16

50. Three thieves rob a bakery of bread, one after the other. Each thief takes half of what is present and half bread. If 3 breads remain at the end, what is the number of breads that were present initially ?
(A) 24 (B) 31 (C) 37 (D) 41

51. A caterpillar crawls up a pole of 75 inches high standing from the ground. Each day is crawls up 5 inches and each night it slides down 4 inches. When will it reach the top of the pole ?
(A) At the end of 70 days (B) At the end of 71 days
(C) At the end of 72 days (D) At the end of 73 days

52. A man's investments doubles in every 5 years. If the invested Rs. 5,000 in each of the years 1990, 1995, 2000 and 2005, then what was the total amount received by him in 2010 ?
(A) Rs. 140000 (B) Rs. 30000 (C) Rs. 70000 (D) Rs. 150000

Questions 53 to 57 are based on the following "

A, B, C, D, E, F, G and H are sitting around a circular table facing the centre. Each one of them has a different profession viz, doctor, engineer, architect, teacher, clerk, shopkeeper, banker and businessman.

- A sit third to right of teacher.
- D sits second to left of G.
- G is not an immediate neighbor of teacher.
- Only one person sit between B, the shopkeeper and the teacher.
- The one who is an architect sits third to right of the shopkeer.
- H is sit between architect and engineer.
- E is not an immediate neighbor of H.
- Engineer sits third to the right of clerk.
- Only one person sits between the businessman and F.

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53. E is neither a businessman nor a doctor. Who amongst the following is the clerk ?
(A) C (B) D (C) E (D) G

54. which of the following is true with respect to the given sitting arrangement ?
(A) E is an immediate neighbor of the engineer
(B) E is an architect.
(C) The clerk is an immediate neighbor of the banke.
(D) The teacher sits between H and the engineer.

55. What is the profession of H ?
(A) Architect (B) Shopkeeper (C) Banker (D) Teacher

56. Who sits exactly between the architect and businessman ?
(A) C and H (B) Cleark
(C) Banker and Shopkeeper (D) Doctor

57. Who sits immediately right of the businessman ?
(A) Teacher (B) Doctor (C) Cleark (D) Banker

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58. Raghav left his home for office in car. He drove 15 km straight towards North and then turned eastwards and covered 8 km. He then turned to left and covered 1 km. He again turned left and drove for 20 km and reached office. How far and in which direction is his office from the home ?
(A) 20 km North – West (B) 15 km North – West
(C) 30 km North – West (D) 25 km North

59. John is 20 years older than Steve. In 10 years, Steve's age will be half that of John ? What is Steve's age now ?
(A) 2 (B) 8 (C) 10 (D) 20

60. Pointing to a boy, Aruna said to Pushpa, "The mother of his father is the wife of your maternal grand-father". How is Pushpa related to that boy ?
(A) Sister (B) Niece (C) Cousin sister (D) Wife

61. Which of the following pairs of number follow the number in the series 2, 4, 12, 24, 72, _____, _____?
(A) 44, 432 (B) 288, 332 (C) 332, 288 (D) 432, 144

62. P, Q, R, S, T and U are sitting in two rows, three in each row facing each other.
- R is second to the left of P.
- Q and T are facing each other.
- S and P are diagonally opposite to each other.
- Q is not a neighbor of R

Which of the following are sitting in a row ?
(A) P, Q, R (B) P, U, S (C) U, T, S (D) P, T, R

Questions 63 to 66 are based on the following :

There are six teacher A, B, C, D, E, and F in a school, Each teacher has to teach two subjects, one compulsory and the other optional. D's optional is History, while three other have it as compulsory subject. E and F have Physics as one of their subjects. F's compulsory subject is Mathematics, which is an optional subject of both C and E. History and English are A's subjects but in term of compulsory and optional subjects, they are reverse of D's. Chemistry is an optional subject of one of the teachers. There is only one female techer, who has English as her compulsory subject.

63. What is C's compulsory subject ?
(A) Physics (B) Chemistry (C) English (D) History

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64. Who among the following, has chemistry as a subject ?
(A) A (B) B (C) C (D) D

65. Which of the following groups of teachers has History as the compulsory subjects ?
(A) B, C and D (B) C and D (C) A, B and C (D) A, C and D

66. Disregarding which is compulsory or optional subject, who has the same two subject combination as that of F ?
(A) B (B) E (C) D (D) A

67. If TRANSFER is coded as RTNAFSRE, the ELEPHANT would be coded as
(A) LEPEHATN (B) LEPEAHTN (C) LEEPAHTN (D) LEPEAHNT

68. Which two of the following numbers comes in the next in the following sequence.
61, 57, 50, 61, 43, 36, 61, ...
(A) 29, 61 (B) 29, 20 (C) 29, 22 (D) 31, 61

69. How many minimum number of colours will be required to paint all the sides of a cube without the adjacent sides having the same colours ?
(A) 3 (B) 4 (C) 5 (D) 6

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70. In the following sequence, which pair of numbers fill in the blanks ?
1, 1, 3, 2, 8, 5, 21, 13,
(A) 54, 33 (B) 34, 55 (C) 55, 34 (D) 33, 54

71. A and B are independent witness in a case, The chance that A speaks truth is x and B speaks truth is y. If A and B agree on 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) $\frac{(1-x)(1-y)}{xy+(1-y)(1-x)}$ (D) $\frac{x+y}{xy+(1-x)(1-y)}$

72. The harmonic mean of two numbers is 4. Their arithmetic mean A and the geometric mean G satisfy the relation $2A + G^2 = 27$, then the two numbers are
(A) 4 and 2 (B) 6 and 3 (C) 5 and 7 (D) 4 and 1

73. In an entrance test there are multiple choice questions, with four possible answers to each question of which one is correct. The probability that a student knows the answer to a question is 90%. If the student gets the correct answer to a question, then the probability that he was guessing is
(A) $\frac{37}{40}$ (B) $\frac{1}{37}$ (C) $\frac{36}{37}$ (D) $\frac{1}{9}$

74. A man is known to speak the truth 2 out of 3 times. He threw a dice cube with 1 to 6 on its faces and reports that it is 1. Then the probability that it is actually 1 is
(A) $\frac{1}{2}$ (B) $\frac{1}{7}$ (C) $\frac{2}{7}$ (D) $\frac{5}{6}$

75. 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 $P(\bar{A}) = \frac{1}{4}$ where $\bar{A}$ stands for complement of event A. Then the events A and B are
(A) independent but not equally likely
(B) mutually exclusively and independent
(C) equally likely and mutually exclusive
(D) equally likely but not independent

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76. The mean and variance of a random variable X having binomial distribution are 4 and 2 respectively. The P(X = 1) is
(A) $\frac{1}{32}$ (B) $\frac{1}{16}$ (C) $\frac{1}{8}$ (D) $\frac{1}{4}$

77. If $\bar{x}$ is the mean of distribution of X, then usual notation $\sum_{i=1}^{n} f_i(x_i - \bar{x})$ is

(A) Mean deviation about mean
(B) Standard deviation
(C) 1
(D) 0

78. If E_1 and E_2 are two events associated with a random experiment such that $P(E_2) = 0.35$, $P(E_1 \text{ or } E_2) = 0.85$ and $P(E_1 \text{ or } E_2) = 0.15$, then $P(E_1)$ is

(A) 0.25 (B) 0.35 (C) 0.65 (D) 0.75

79. Find a matrix x such that $2A + B + X = 0$, whose $A = \begin{bmatrix} -1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -2 \\ 1 & 5 \end{bmatrix}$

(A) $\begin{bmatrix} 1 & 2 \\ 7 & 13 \end{bmatrix}$ (B) $\begin{bmatrix} -1 & -2 \\ -7 & -13 \end{bmatrix}$ (C) $\begin{bmatrix} 13 & 2 \\ 7 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} -13 & -2 \\ -7 & -1 \end{bmatrix}$

80. If in a triangle ABC, the altitudes from the vertices A, B, C on opposite sides are in HP, then Sin A, Sin B, Sin C are in

(A) HP
(B) Arithmetico – Geometric progression
(C) AP
(D) GP

81. α, β are the roots of the an equation $x^2 - 2x \cos\theta + 1 = 0$, then the equation having α^π and β^π is

(A) $x^2 - (2 \cos n\theta)x + 1 = 0$
(B) $2x^2 - (2 \cos n\theta)x - 1 = 0$
(C) $x^2 + (2 \cos n\theta)x + 1 = 0$
(D) $x^2 + (2 \cos n\theta)x - 1 = 0$

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82. The equation $(x - a)^3 + (x - b)^3 + (x - c)^3 = 0$ has

(A) All three real roots
(B) One real and two imaginary roots
(C) Three real roots, namely $x = a, y = b, z = c$
(D) None of these

83. Three positive numbers whose sum is 21 are in arithmetic progression. If 2, 2, 14 are added to them respectively then resulting numbers are in geometric progression. Then which of the following is not among the three numbers ?

(A) 25 (B) 13 (C) 1 (D) 7

84. If $\sin^{-1}\frac{2a}{1+a^2}+\sin^{-1}\frac{2b}{1+b^2}=2\tan^{-1}n$ then

(A) $n=\frac{(a-b)}{(1+ab)}$ (B) $n=\frac{ab}{(a-a)}$ (C) $n=\frac{(a+b)}{(1-ab)}$ (D) $n=\frac{(1-ab)}{(1+ab)}$

85. The value of A that satisfies the equation a sin A + b cos A – c is equal to

(A) $\tan^{-1}\left(\frac{a}{b}\right)\pm\cos^{-1}\left(\frac{c}{\sqrt{a^2+b^2}}\right)$ (B) $\tan^{-1}\left(\frac{c}{b}\right)\pm\sin^{-1}\left(\frac{a}{\sqrt{a^2+b^2}}\right)$

(C) $\tan^{-1}\left(\frac{a}{b}\right)\pm\sin^{-1}\left(\frac{c}{\sqrt{a^2+b^2}}\right)$ (D) None of these

86. if $\tan x=\frac{-3}{4}$ and $\frac{3\pi}{2}<x<2\pi$, then the value of sin 2x is

(A) 7/25 (B) -7/25 (C) 24/25 (D) -24/25

87. Find the principal value of $\cot^{-1}\left(-\sqrt{3}\right)$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{6}$ (C) $\frac{7\pi}{6}$ (D) $\frac{5\pi}{6}$

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88. If $\cos\theta=\frac{4}{5}$ and $\cos\phi=\frac{12}{13}$, with θ and ϕ both in the fourth quadrant, the value of cos $(\theta+\phi)$ is

(A) $-\frac{16}{65}$ (B) $-\frac{33}{65}$ (C) $\frac{33}{65}$ (D) $\frac{16}{65}$

89. The value of sin 36 is

(A) $\frac{\sqrt{10+2\sqrt{5}}}{4}$ (B) $\frac{\sqrt{10-2\sqrt{5}}}{4}$ (C) $\frac{(\sqrt{5}+1)}{4}$ (D) $\frac{(\sqrt{5}-1)}{4}$

90. Express (cos 5x – cos 7x) as a product of sines or cosines or sines and cosines.

(A) 2 cos 4x cos x (B) 2 sin 4x sin x (C) 2 sin 6x sin x (D) 2 cos 6x cos x

91. If non-zero numbers ,a b, c are in A.P., then the straight line $\frac{x}{a}+\frac{y}{b}+\frac{1}{c}=0$ always passes through a fixed point, then the point is

(A) (1, -2) (B) $\left(1,-\frac{1}{2}\right)$ (C) (-1 , 2) (D) (-1, -2)

92. If the lines x + (a – 1)y + 1 = 0 and 2x + a^2y – 1 = 0 are perpendicular, then the condition satisfied by a is

(A) |a| = 2 (B) 0 < a < 1 (C) -1 < a < 0 (D) a = -1

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93. In a triangle ABC, let $\angle C=\frac{\pi}{2}$. If r is the inradius and R is circumradius of the triangle ABC, then 2(r + R) equals

(A) a + c (B) a + b + c (C) a + b (D) b + c

94. If x^2 + 3xy + $2y^2$ – x – 4y – 6 = 0 represents a pair of straight lines, their point of intersection is

(A) (0, 0) (B) (8, 5) (C) (8, -5) (D) (-2, 5)

95. The equation of the tangent line to the curve y = 2x sin x at the point $\left(\frac{\pi}{2},\pi\right)$ is

(A) y = 2x + 2π (B) y = 2x (C) y = -2x + 2π (D) y = -2x

96. If the graph of $y = (x-2)^2 - 3$ is shifted by 5 units up along y-axis and 2 units to the right along the x-axis, then the equation of the resultant graph is
(A) $y = x^2 + 2$ (B) $y = (x-2)^2 + 5$ (C) $y = (x+2)^2 + 2$ (D) $y = (x-4)^2 + 2$

97. The direction cosines of the vector $a = (-2i + j - 5k)$ are
(A) -2, 1, -5 (B) $\frac{1}{3}, \frac{-1}{6}, \frac{-5}{6}$
(C) $\frac{2}{\sqrt{30}}, \frac{1}{\sqrt{30}}, \frac{5}{\sqrt{30}}$ (D) $\frac{-2}{\sqrt{30}}, \frac{1}{\sqrt{30}}, \frac{-5}{\sqrt{30}}$

98. The equation of the hyperbola with centre at the region, length of the transverse axis is 6 and one focus (0, 4) is
(A) $\frac{y^2}{9} + \frac{x^2}{7} = 1$ (B) $\frac{y^2}{9} - \frac{x^2}{7} = 1$
(C) $\frac{y^2}{7} + \frac{x^2}{9} = 1$ (D) $\frac{y^2}{7} - \frac{x^2}{9} = 1$

99. If $\vec{a}, \vec{b}, \vec{c}$ are vectors such that $\vec{a} + \vec{b} + \vec{c} = 0$ and $|\vec{a}| = 7, |\vec{b}| = 5, |\vec{c}| = 3$, then the angle between the vectors $\vec{b}$ and $\vec{c}$ is
(A) 60º (B) 30º (C) 45º (D) 90º

100. If $a\hat{i} + \hat{j} + k\hat{i} + \hat{j} + c\hat{k}, (a \neq b \neq c \neq 1)$ are co-planar, then the value of $\frac{1}{1-a} + \frac{1}{1-b} + \frac{1}{1-c}$ is
(A) -1 (B) $-\frac{1}{2}$ (C) $\frac{1}{2}$ (D) 1

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101. Let $\vec{a}, \vec{b}$ and $\vec{c}$ be three vector having magnitudes 1, 1 and 2 respectively. If $\vec{a} \times (a \times \vec{c}) - \vec{b} = 0$ then the acute angle between $\vec{a}$ and $\vec{c}$ is
(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{6}$ (C) $\frac{\pi}{3}$ (D) None of these

102. Let $\vec{a},\vec{b},\vec{c}$ be vector such that $|\vec{a}|=2,|\vec{b}|=3,|\vec{c}|=5$ and $\vec{a}+\vec{b}+\vec{c}=\vec{0}$. The value of $\vec{a}.\vec{b}+\vec{b}.\vec{c}+\vec{c}.\vec{a}$ is

(A) 38 (B) -38 (C) 19 (D) -19

103. If $\vec{a}=(\hat{i}+2\hat{j}-3\hat{k})$ and $\vec{b}=(3\hat{i}-\hat{j}+2\hat{k})$ then the angle between (a + b) and (a – b) is

(A) $\frac{\pi}{3}$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{2}$ (D) $\frac{2\pi}{3}$

104. The number of elements in the power set P(S) of the set S = [2, (1, 4)] is

(A) 2 (B) 4 (C) 8 (D) 10

105. If $(1 - x + x^2)^n = a_0 + a_1x + a_2x^2 + ... + a_{2n}x^{2n}$, then $a_0 + a_2 + a_4 + ... + a_{2n}$ is

(A) $\frac{3^n+1}{2}$ (B) $\frac{3^n-1}{2}$ (C) $\frac{1-3^n}{2}$ (D) $3^n+\frac{1}{2}$

106. m distinct animals of a circus have to be placed in m cages, one is each cage. There are n small cages and p small animal (n < p < m). The large animals are so large that they do not fit in small cage. However, small animals can be put in any cage. The number of putting the animals into cage is

(A) $\{^{(m-n)}P_p\}\ \{^{(m-p)}P_{(m-p)}\}$ (B) $^{(m-n)}C_P$

(C) $\{^{(m-n)}C_p\}\ \{^{(m-p)}C_{(m-p)}\}$ (D) $^{(m-n)}P_p$

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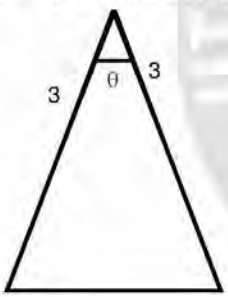
107. Let A and B two sets containing four and two elements respectively. The number of subsets of the A × B, each having at least three elements is

(A) 270 (B) 239 (C) 219 (D) 256

108. The slope of the function $f(x) = \begin{cases} x^2 \sin\left(\frac{1}{x}\right), & x \neq 0 \\ 0 & x = 0 \end{cases}$

(A) 1 (B) 0 (C) -1 (D) None of these

109. What is the largest area of an isosceles triangle with two edges of length 3 ?



(A) 3 (B) 3/2 (C) 9 (D) 9/2

110. The value of $\int_9^x x^3 \sin dx$ is

(A) $\pi^3 - 6\pi$ (B) $-\pi^3 - 6\pi$ (C) $-\pi^3 + 6\pi$ (D) $\pi^3 + 6\pi$

111. let f(a) be a polynomial of degree four, having extreme value at x = 1 and x = 2. If $\lim_{x\to 0}\left[1+\frac{f(x)}{x^2}\right] = 3$, then f(2) is

(A) 0 (B) 4 (C) -8 (D) -4

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112. The maximum value of $4\sin^2 x + 3\cos^2 x + \sin x/2 + \cos x/2$ is

(A) 4 (B) $3+\sqrt{2}$ (C) 9 (D) $4+\sqrt{2}$

113. The solution of $(e^x + 1)ydy = (y + 1)e^x dx$ is

(A) $e^x = c(e^x + 1)(y + 1)$ (B) $e^y = e^x + y + 1$

(C) $y = (e^x + 1)(y + 1)$ (D) None of these

114. Evaluate $\int_0^1 x(1-x)^n dx$

(A) $\frac{-1}{(n+1)(n+2)}$ (B) $\frac{1}{(n+1)(n+2)}$ (C) $(n + 1)(n + 2)$ (D) $(n - 1)(n - 2)$

115. The critical point and nature for the function $f(x, y) = x^2 - 2x + 2y^2 + 4y - 2$ is

(a) (1, 1) maximum (B) (1, -1) maximum

(C) (1, 1) minimum (D) (1, -1) minimum

116. If $y = \cos^2 x^2$, find dy/dx

(A) $4x^2 \sin x^2 \cos x^2$ (B) $-4x^2 \cos x^2 \sin x^2$

(C) $2x \sin x^2 \cos x^2$ (D) $-2x \cos x^2 \sin x^2$

117. The derivative of $(x^3 + e^x + 3^x + \cot x)$ with respect to x is

(A) $3x^2 + e^x + 3^x(\log 3) - \text{cosec}^2 x$

(B) $3x^2 + e^x + 3^x(\log 3) + \text{cosec}^2 x$

(C) $3x^2 + e^x + 3^x(\log 3) - \sec^2 x$

(D) $3x^2 + e^x + 3^x(\log 3) + \sec^2 x$

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118. The solution of the differential equation $\frac{dy}{dx} = e^{x+y} + x^2 e^y$ is

(A) $e^{x-y} + \frac{x^3}{3} + c$ (B) $e^x + e^{-y} + \frac{x^3}{3} + c$

(C) $e^x - e^{-y} = \frac{x^3}{3} + c$ (D) None of these

119. Differentiate [-log(log x), x > 1] with respect to x

(A) -1/(x log x) (B) 1/log x (C) 1/x (D) x log x

120. Evaluate $\lim_{x\to 0}\frac{x\tan x}{(1-\cos x)}$

(A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) -2 (D) 2

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