Section A — Reasoning

Choose the most appropriate option.

(Q.No. 1 to 30)

Directions for question numbers 1 to 7 :

Study the following information carefully to answer the questions given below :

A number sorting machine when given an input of numbers, rearranges the numbers in a particular manner step by step as indicated below till all the numbers are arranged in a particular order. Given below is an illustration of this arrangement.

Input : 39 121 48 18 76 112 14 45 63 96
Step I : 14 39 121 48 18 76 112 45 63 96
Step II : 14 39 48 18 76 112 45 63 96 121
Step III : 14 18 39 48 76 112 45 63 96 121
Step IV : 14 18 39 48 76 45 63 96 112 121
Step V : 14 18 39 45 48 76 63 96 112 121
Step VI : 14 18 39 45 48 63 76 96 112 121

(This is the final arrangement and Step VI is the last step for this input)

1. Which of the following will be the third step for the following input ?

Input : 45 78 97 132 28 16 146 54 99 112

   (A) 16 28 45 78 97 146 54 99 112 132

   (B) 16 28 45 97 78 54 99 112 132 146

   (C) 16 28 45 78 97 132 54 99 112 146

   (D) 16 28 45 97 78 132 99 54 112 146

2. If the second step for an input is as given below, what will be the fifth step for the same input ?

Step II :   22 49 32 88 69 132 101 185

   (A) 22 32 49 88 69 101 132 185

   (B) 22 32 69 49 88 101 132 185

   (C) 22 32 49 69 101 88 132 185

   (D) None of these

3. What will be the Step III for the following input ?

Input :   68 182 39 93 129 46 21 58

   (A) 21 39 68 93 129 46 58 182

   (B) 21 39 68 129 93 46 58 182

   (C) 21 68 39 93 129 46 58 182

   (D) Cannot be determined

4. What will be the last step for the following input ?

Input :   138 63 49 93 89 122 32 71

   (A) 32 49 71 63 89 93 122 138

   (B) 32 49 63 71 93 89 122 138

   (C) 32 49 63 71 89 93 122 138

   (D) Cannot be determined

5. How many steps will be required for getting the final output for the following input ?

Input : 101 85 66 49 73 39 142 25 115 74

   (A) 5   (B) 6

   (C) 7   (D) 8

6. What will be the Step II for the following input ?

Input : 47 62 17 92 86 42 24 79

(A) 17 24 47 62 86 42 79 92

(B) 17 47 62 86 42 24 79 92

(C) 17 24 47 62 92 86 42 79

(D) 17 47 62 86 24 42 79 92

7. If the following is the fifth step of an input, what will be the third step ?

Step V : 17 32 43 82 69 93 49 56 99 106

(A) 17 32 43 82 69 93 49 56 99 106

(B) 17 32 82 69 43 93 49 56 99 106

(C) 17 32 82 69 93 43 49 56 99 106

(D) Cannot be determined

8. Which of the following will be the middle digit of the middle number after reversing the digits of the following numbers ?

389 675 493 728 536

(A) 3   (B) 2

(C) 8   (D) 9

9. If water is called blue, blue is called red, red is called white, white is called sky, sky is called rain, rain is called green, green is called air and air is called table, which of the following is the colour of milk ?

(A) White   (B) Rain

(C) Sky   (D) Green

10. Prabhat remembers that his mother's birthday is after 17th April but before 21st April, whereas his sister Urmila remembers that their mother's birthday is after 19th but before 24th April. Which of the following days in April is definitely their mother's birthday ?

(A) 19th   (B) 21st

(C) 22nd   (D) 20th

11. If it is possible to make a meaningful word with the second, fourth, eighth, and the tenth letters of the word CONSIDERATION, which of the following will be the first letter of that word ? If no such word can be made, give X as answer. If more than one such word can be made, give "M" as the answer.

(A) X   (B) R

(C) S   (D) M

Directions for question numbers 12 to 15 :

Use the information given below :

There is a group of five persons – A, B, C, D, and E. In the group there is a Professor of Philosophy, a Professor of Psychology and a Professor of Economics. A and D are ladies who have no specialisation in any subject and are married. No lady is a philosopher or economist. There is a married couple in the group of which E is the husband. B is the brother of C and is neither a psychologist nor an economist.

12. Who is the Professor of Philosophy ?

(A) A   (B) B

(C) C   (D) D

13. Who is the wife of E ?

(A) A   (B) B

(C) C   (D) D

14. Which of the following groups includes all the men ?

(A) ABC   (B) BCD

(C) BC   (D) BE

15. Who is the Professor of Economics ?

(A) A   (B) B

(C) E   (D) C

Directions for question numbers 16 to 18 :

Read the following information carefully and answer the questions given below :

(i) Five students Sujit, Randhir, Neena, Mihir and Vinay have total five books on subjects Physics, Chemistry, Maths, Biology and English written by authors Gupta, Khanna, Harish, D'Souza and Edwin. Each student has only book on one of the five subjects.

(ii) Gupta is the author of Physics book, which is not owned by Vinay or Sujit.

(iii) Mihir owns the book written by Edwin.

(iv) Neena owns Maths book. Vinay has English book, which is not written by Khanna. Biology book is written by D'Souza.

16. Which of the following is correct combination of subject, student and author ?
(A) Maths-Neena-Harish
(B) Physics-Mihir-Gupta
(C) English-Vinay-Edwin
(D) Biology-Sujit-D'Souza

17. Who is the owner of the book written by Harish ?
(A) Vinay
(B) Sujit
(C) Randhir
(D) Data inadequate

18. Who is the author of Chemistry book ?
(A) Harish only
(B) Edwin only
(C) Khanna or Harish
(D) Edwin or Khanna

19. Introducing a man a woman said, "He is the only son of my mother's mother". How is the woman related to the man ?
(A) Mother   (B) Aunt
(C) Niece   (D) Sister

20. Ramesh walked 5 kms towards east then he turned right and walked 8 kms. He then turned left and walked 5 kms. He again turned left and walked 8 kms. At what distance is he now from the starting point ?
(A) 13 kms
(B) 5 kms
(C) 16 kms
(D) None of these

21. Which of the following does not fit in the letter number series given below ?
G 4 T   J 10 R   M 20 P   P 43 N   S 90 L
(A) J 10 R   (B) M 20 P
(C) P 43 N   (D) G 4 T

22. After establishment of industrial estate 5 years ago at village 'D' the economic condition of its villages has improved considerably. Which of the following, if true, contradicts the statement ?
(A) A branch of a bank has opened at village 'D' during last three years.
(B) The shops of village 'D' report increase in the sale of entertainment items during last two years.
(C) Very recently hotels with beer bars have come up in village 'D'.
(D) Money lenders and the branches of banks report demand for second loan to return earlier loan.

23. Poster is related to wall in the same way as photograph is related to _____.
(A) Frame   (B) Camera
(C) Object   (D) People

24. A supplement of Vitamin A and Zinc may boost children's resistance to Malaria (observation from one experiment conducted last year in a village 'X'). Which of the following, if true, would weaken the statement ?
(A) No adult in village 'X' has fallen sick because of Malaria.
(B) Last three years there is hardly any case of child affected by Malaria from village 'X'.
(C) The experiment with Vitamin A and Zinc is being duplicated in other nearby cities adjacent to village 'X'.
(D) Vitamin A and Zinc are readily available in village 'X'.

25. Ten boys are standing in a row facing the same direction. Abhijit, who is 7th from the left end of the row, is to the immediate right of Sushant, who is 5th from the right end of the row; Sushant is 3rd to the right of Rupin. How many children are there between Abhijit and Rupin ?
(A) One
(B) Two
(C) Three
(D) Data inadequate

Read the following information to answer the given questions.

Six lectures A, B, C, D, E, F are to be organised only on one each day from Monday to Sunday in accordance with the following...

(i) C should not be organised on Friday.

(ii) A should be organised immediately after D.

(iii) There should be a gap of two days between B and F.

(iv) On one day there will be no lecture (Saturday is not that day), just before that day F will be organised.

(v) E should be organised on Wednesday and should not be followed by F.

26. Which of the information is not required in finding the complete sequence of organisation of lectures ?

(A) (i) only

(B) (ii) only

(C) (i) and (ii) only

(D) All are required

27. On which day, there is no lecture ?

(A) Sunday

(B) Friday

(C) Monday

(D) Cannot be determined

28. How many lectures are organised between F and D ?

(A) None   (B) One

(C) Two   (D) Three

29. On which day will the lecture D will be organised ?

(A) Friday   (B) Saturday

(C) Sunday   (D) Thursday

30. Which of the following is the last lecture in the series ?

(A) A   (B) C

(C) B   (D) None of these

Section B — English

Choose the most appropriate option.

(Q.No. 31 to 60)

Directions for question numbers 31 to 34 :

Each sentence has been divided into three parts, indicated by A, B and C. Read each sentence to find out, if there is an error. If you find an error in any of the parts (A, B or C), indicate your response. If a sentence has no error, mark your answer as D.

31. I wonder / how am I / to do it. /
    (A)   (B)   (C)
    No error.
     (D)

32. The students were / awaiting for /
         (A)   (B)
    the arrival of the chief guest. / No error.
                (C)   (D)

33. If I am you ? / I would have seen to it /
        (A)   (B)
    that I won prize. / No error.
        (C)   (D)

34. They were off to a / flying start but cannot /
              (A)   (B)
    keep up their pace. / No error.
           (C)   (D)

Directions for question numbers 35 to 44 :

Read the following passage carefully, and answer the questions given below them, in the context of the passage.

Strange, un-fathomable happiness of thinking of seeking knowledge for its own sake. So much of our life is spent in solving problems to avoid immediate pain or to bring immediate profit, so much of our training is aimed at bringing practical or pragmatic effect designing and running machines, buying, selling, cooking, furnishing, investing, spending, so many worthy results are obtained by purposeful planning and directed thinking that we forget how true and inexhaustible is the happiness of pure knowing. Everyone has tasted it. It is born in children. It goes to school with them, and is too often killed there by tired or practical teachers. But in some, it survives and unlike other delights it endures for life. To spend 50 or 60 years in studying the structure of fishes or the relation between logic and language, the history of the Incas or the rules of comets, the geometry of Non-Euclidean space, the literature of leei and/or the anatomy of the brain, to acquire, systematic and record new knowledge or any subject without expectation of benefit making except by extending its range of understanding that is to pass a happy and valuable life, usually tempered at the close by regret that another 50 years could not be added, in which to learn more and still more. It is the purest and least selfish satisfaction known to man, except those of creating a work of art and healing the sick. It is, Aristotle said, to share the activity of God-himself, his eternal life of pure contemplation.

35. This paragraph is about :

(A) Children's innate desire for knowledge

(B) The happiness of seeking pure knowledge

(C) The desire for knowledge inherent in all men and women

(D) The need for practical knowledge

36. Seeking knowledge for its own sake gives man :

(A) Expected benefits

(B) Happiness

(C) Only selfish satisfaction

(D) Practical ability

37. The writer compares the search for knowledge with "creating a work of art and healing the sick" in terms of :

(A) Self satisfaction

(B) Creativity

(C) Selfless satisfaction

(D) Happiness obtained

38. The writer's attitude towards seeking knowledge for its own sake is :

(A) Critical

(B) Equivocal

(C) Reverential

(D) Unambiguous

39. According to the writer, very little human life is spent in :

(A) Pragmatic thinking

(B) Problem solving

(C) Acquiring knowledge per se

(D) The purposeful study of various projects

40. To spend 50 or 60 years..... in which to learn more and still more. The illustration in this paragraph are examples of subjects that :

(A) Have no direct relevance to the welfare of man

(B) May be situated for their practical relevance or for the sake of knowledge

(C) Have direct relevance to the welfare of man

(D) Can be studied only for the sake of knowledge

41. The expression "other delights" as mentioned in the passage refers to :

(A) Cooking, furnishing, investing and spending

(B) Every pleasure of pure knowledge

(C) Avoiding immediate pain

(D) Pragmatic effects

42. The word 'tempered' as used in the passage means :

(A) Mixed

(B) Reduced

(C) Moderated

(D) Brought to its proper level

43. "Everyone has tasted it" is mentioned in the paragraph. 'It' here refers to :
    (A) Directed thinking
    (B) Cooking
    (C) Happiness of pure knowing
    (D) Pure knowing

44. The word "eternal" stands for :
    (A) Light
    (B) Heavenly
    (C) Expel by legal process
    (D) That always (has existed) and will exist

Directions for question numbers 45 to 48 :
Find the word which is closest in meaning to the phrase or sentences given below :

45. Exhausted by lucubration :
    (A) Long walks
    (B) Lecturing
    (C) Exposure
    (D) Laborious study

46. Read with avidity :
    (A) Understanding
    (B) Fear
    (C) Eagerness
    (D) Complaint

47. A sumptuous house :
    (A) Luxurious
    (B) Ornate
    (C) Old-fashioned
    (D) Artistic

48. A cognate language :
    (A) Difficult   (B) Universal
    (C) Ancient   (D) Kindred

Directions for question numbers 49 to 52 :
Each of the following sentences has a blank space and four words given after it. Select the word which consider most appropriate for the blank space and indicate your choice.

49. 'Please' and 'Thank you' are the little courtesies by which we keep the _____ of life oiled and running smoothly.
    (A) Path   (B) Machine
    (C) Garden   (D) River

50. If negotiations are to prove fruitful, there must not only be sincerity on each side, but there must also be _____ in sincerity of the other side.
    (A) Faith   (B) Belief
    (C) Substance   (D) Certainty

51. The criminal seems to have acted in _____ with three others.
    (A) Collusion   (B) Coalition
    (C) Collision   (D) Cohesion

52. If someone deliberately damages your property, he is _____ to pay for the cost of repairs.
    (A) Liable   (B) Forced
    (C) Requested   (D) Compelled

For the following idiomatic verbal expressions find the best answer given after them :

53. To draw the long bow
    - (A) to put up high demands
    - (B) to make an exaggerated statement
    - (C) to demand a very high price
    - (D) to overestimate oneself

54. Spick and span
    - (A) A ready-made something
    - (B) Outspoken
    - (C) Garrulous
    - (D) Neat and clean

55. Choose the alternative which is exact opposite to the given word 'inimical' :
    - (A) Emotional
    - (B) Neutral
    - (C) Cheerful
    - (D) Friendly

Directions for question numbers 56 to 60 :

You are given certain sentences which have been jumbled and named P, Q, R and S. You should find the proper sequence of these four that will reconstruct the original sentence. From the list of options given, choose the one which you think contains the correct sequence.

56. As a youth
    - P : extravagant clothes and adopting
    - Q : he was a dandy
    - R : melodramatic Byronic poses
    - S : who delighted in wearing
    - (A) QPSR
    - (B) QSPR
    - (C) QRPS
    - (D) PQRS

57. The idea of the yahoos
    - P : too,
    - Q : in all its devastating implications,
    - R : is one to be explored
    - S : but not taken as the last word about human nature
    - (A) RQSP
    - (B) SPRQ
    - (C) PRQS
    - (D) SRPQ

58. The workhouse authorities
    - P : in the household
    - Q : of a shopkeeper
    - R : find her a job
    - S : and she succeeds in placing Jackie with a kindly widow
    - (A) RPQS
    - (B) PRQS
    - (C) QSRP
    - (D) SQRP

59. But whereas the
    - P : was simple
    - Q : of Nashe is skillful and sophisticated
    - R : and crude, that
    - S : approach of the boy
    - (A) PRQS
    - (B) SPRQ
    - (C) RQPS
    - (D) QSRP

60. A policeman,
    - P : to abide
    - Q : if he has to do well,
    - R : by the strict letters of the law
    - S : cannot afford
    - (A) QSPR
    - (B) SPRQ
    - (C) RQPS
    - (D) PRQS

Section C — Aptitude

Choose the most appropriate option.

(Q.No. 61 to 90)

61. The L.C.M. of $(x^3 - x^2 - 2x)$ and $(x^3 + x^2)$ is :

(A) $x^3 - x^2 - 2x$ (B) $x^2 + x$

(C) $x^4 - x^3 - 2x^2$ (D) $x - 2$

62. Ashok's age is $\left(\dfrac{1}{6}\right)^{th}$ of his father's age. The father's age will be twice of Kamal's age after 10 years. If Kamal's eighth birthday was celebrated 2 years before, what is Ashok's present age ?

(A) 24 years   (B) 30 years

(C) $\dfrac{20}{3}$ years   (D) None

63. If $t^2 - 4t + 1 = 0$, then the value of $[t^3 + 1/t^3]$ is :

(A) 44   (B) 48

(C) 52   (D) 64

64. The difference between simple interest and compound interest on a sum for 2 years at 8%, when the interest is compounded annually is ₹ 16. If the interest were compounded half-yearly, the difference in 2 years would be nearly :

(A) ₹ 16   (B) ₹ 16.80

(C) ₹ 21.85   (D) ₹ 24.64

65. A man travels 35 km partly at 4 kmph and partly at 5 kmph. If he covers the former distance at 5 kmph and the later distance at 4 kmph, he could cover 2 km more in the same time. The time taken to cover the whole distance at the original rate (in hours) is :

(A) $4\dfrac{1}{2}$ (B) 7

(C) 8   (D) 9

66. A certain number consists of two digits whose sum is 9. If the order of digits is reversed, the new number is 9 less than the original number. The original number is :

(A) 45   (B) 36

(C) 54   (D) 63

67. In an examination, 52% of the candidates failed in English, 42% in Mathematics and 17% in both. The number of those who passed in both the subjects, is :

(A) 83%   (B) 23%

(C) 64%   (D) 55.5%

68. A can do a piece of work in 14 days which B can do in 21 days. They begin together but 3 days before the completion of the work, A leaves off. The total number of days to complete the work is :

(A) $\dfrac{33}{5}$ (B) $8\dfrac{1}{2}$

(C) $\dfrac{51}{5}$ (D) $13\dfrac{1}{2}$

69. The greatest number of four digits which is divisible by each one of the numbers 12, 18, 21 & 28, is :

(A) 9848

(B) 9864

(C) 9828

(D) 9636

70. If 9 men working $7\frac{1}{2}$ hours a day can finish a work in 20 days, then how many days will be taken by 12 men working 6 hours a day to finish the work, it being given that 3 men of former type work as much as 2 men of the latter type in the same time ?

(A) $12\frac{1}{2}$

(B) 13

(C) $9\frac{1}{2}$

(D) 11

71. Due to a fall in the rate of interest from 13% p.a. to $12\frac{1}{2}$ % p.a., a money lender's yearly income diminishes by ₹ 104. His capital is :

(A) ₹ 21,400

(B) ₹ 20,800

(C) ₹ 22,300

(D) ₹ 24,000

72. ₹ 49 were divided among 150 children. Each girl got 50 paise and a boy 25 paise. How many boys were there ?

(A) 100

(B) 102

(C) 104

(D) 105

73. A boy 1.4 m tall casts a shadow 1.2 m long at the time when a building casts a shadow 5.4 m long. The height of the building is :

(A) 4.63 m

(B) 3.21 m

(C) 6.3 m

(D) 5.6 m

74. A and B entered into partnership with capitals in the ratio 4 and 5. After 3 months, A withdrew $\frac{1}{4}$ of his capital and B withdrew $\frac{1}{5}$ of his capital. The gain at the end of 10 months was ₹ 760. The share of A in this profit is :

(A) ₹ 360

(B) ₹ 330

(C) ₹ 430

(D) ₹ 380

75. 21 mango trees, 42 apple trees and 56 orange trees have to be planted in rows such that each row contains the same number of trees of one variety only. Minimum number of rows in which the above trees may be planted is :

(A) 3

(B) 15

(C) 17

(D) 20

76. The rates of simple interest in two banks A and B are in the ratio 5 : 4. A person wants to deposit his total savings in two banks in such a way that he received equal half-yearly interest from both. He should deposit the savings in Banks A and B in the ratio :

(A) 5 : 2

(B) 2 : 5

(C) 4 : 5

(D) 5 : 4

77. A dinner party is to be fixed for a group consisting of 100 persons. In this party, 50 persons do not prefer fish, 60 prefer chicken and 10 do not prefer either chicken or fish. The number of persons who prefer both fish and chicken is :

(A) 10

(B) 20

(C) 30

(D) 40

78. A dishonest milkman professes to sell his milk at C.P. but he mixes it with water and thereby gains 25%. The percentage of water in the mixture is :

(A) 25%

(B) 20%

(C) 4%

(D) None of these

79. A man invests some money partly in 3% stock at 96 and partly in 4% stock at 120. To get equal dividends from both, he must invest the money in the ratio :

(A) 16 : 25

(B) 4 : 3

(C) 4 : 5

(D) 3 : 5

80. 5% income of A is equal to 15% income of B and 10% income of B is equal to 20% income of C. If income of C is ₹ 2000, then total income of A, B and C (in rupees) is :

(A) 6000

(B) 9000

(C) 12000

(D) 18000

81. The average of 8 readings is 24.3, out of which the average of first two is 18.5 and that of next three is 21.2. If the sixth reading is 3 less than seventh and 8 less than eighth, what is the sixth reading ?

(A) 24.8

(B) 26.5

(C) 27.6

(D) 29.4

82. Three different containers contain different qualities of mixtures of milk and water whose measurements are 403 kg, 434 kg and 465 kg. What biggest measure must be there to measure all different qualities an exact number of times ?

(A) 1 kg

(B) 7 kg

(C) 41 kg

(D) 31 kg

83. Goods were bought for ₹ 600 and sold the same day for ₹ 650.25 at a credit of 9 months and still there was a gain of 2%. The rate percent is :

(A) $\frac{19}{3}$%

(B) $\frac{25}{3}$%

(C) 8.1%

(D) $\frac{470}{61}$%

84. A man sells an article at a gain of 15%. Had he bought it at 10% less and sold it for ₹ 4 less, he would have gained 25%. The cost price of the article is :

(A) ₹ 140

(B) ₹ 150

(C) ₹ 160

(D) ₹ 180

85. A jar full of whisky contains 40% of alcohol. A part of this whisky is replaced by another containing 19% alcohol and now the percentage of alcohol was found to be 26. The quantity of whisky replaced is :

(A) $\dfrac{2}{5}$ (B) $\dfrac{1}{3}$

(C) $\dfrac{2}{3}$ (D) $\dfrac{3}{5}$

86. If $a^x = b$, $b^y = c$ and $c^z = a$, then the value of xyz is :

(A) 0   (B) 1

(C) $\dfrac{1}{3}$ (D) $\dfrac{1}{2}$

87. The banker's discount on a bill due 1 year 8 months hence is ₹ 50 and the true discount on the same sum at the same percent is ₹ 45. The rate percent is :

(A) 6%   (B) $\dfrac{20}{3}\%$

(C) $6\dfrac{1}{2}\%$ (D) $\dfrac{516}{59}\%$

88. A two digit number is such that the product of the digits is 8. When 18 is added to the number, the digits are reversed. The number is :

(A) 18   (B) 24

(C) 81   (D) 42

89. Of the three numbers, the sum of the first two is 45; the sum of the second and third is 55 and the sum of the third and thrice the first is 90. The third number is :

(A) 20   (B) 25

(C) 30   (D) 35

90. $(x^n + a^n)$ is divisible by $(x + a)$:

(A) For all values of n

(B) Only for even values of n

(C) Only for odd values of n

(D) Only for prime values of n

Section D – Basic Mathematics

Choose the most appropriate option.

(Q.No. 91 to 120)

91. In a swimming-pool 90 m by 40 m, 150 men take a dip. If the average displacement of water by a man is 8 cubic metres, what will be rise in water level ?

(A) 30 cm

(B) 33.33 cm

(C) 20.33 cm

(D) 25 cm

92. A conical tent is to accommodate 10 persons. Each person must have $6\,m^2$ space to sit and $30\,m^3$ of air to breath. What will be height of cone ?

(A) 37.5 m

(B) 150 m

(C) 75 m

(D) 15 m

93. A school has 378 girls and 675 boys. All the students divided into strictly boys and strictly girls students sections. All the sections in the school has same number of students. What is the number of sections in the school ?

(A) 27

(B) 36

(C) 39

(D) 23

94. If $P(x, y)$ is any point on the line joining the points $A(a, 0)$ and $B(0, b)$ then the value of $bx + ay - ab$ is :

(A) 1

(B) -1

(C) 0

(D) 2

95. How many pair of natural numbers are there, the differences of whose squares is 45 ?

(A) 1

(B) 2

(C) 3

(D) 4

96. If $a^2 + b^2 + c^2 = 1$, then which of the following can't be the value of $ab + bc + ca$?

(A) 0

(B) $\dfrac{1}{2}$

(C) $\dfrac{-1}{4}$

(D) -1

97. Find all the polynomials with real coefficients $P(x)$ such that $P(x^2 + x + 1)$ divides $P(x^3 - 1)$.

(A) ax^n

(B) ax^{n+2}

(C) ax

(D) $2ax$

98. If A be the area of a right angled triangle and b be one of the sides containing the right angle, then the length of altitude on the hypotenuse is :

(A) $\dfrac{2Ab}{\sqrt{4b^4 + A^2}}$

(B) $\dfrac{Ab}{\sqrt{b^4 + 4A^2}}$

(C) $\dfrac{2Ab}{\sqrt{b^4 + 4A^2}}$

(D) $\dfrac{Ab}{\sqrt{4b^4 + A^2}}$

99. Find the mode of the following data :

Age	0-6	6-12	12-18	18-24	24-30	30-36	36-42
Frequency	6	11	25	35	18	12	6

(A) 20.22

(B) 19.47

(C) 21.12

(D) 20.14

100. In an acute angled triangle ABC, if $tan(A+B-C)=1$ and $Sec(B+C-A)=2$, Find angle A.

(A)   60°   (B)   45°

(C)   30°   (D)   90°

101. What will be area of the rhombus with equations of sides $ax \pm by \pm c = 0$?

(A) $\dfrac{3c^2}{ab}$ sq. units

(B) $\dfrac{4c^2}{ab}$ sq. units

(C) $\dfrac{2c^2}{ab}$ sq. units

(D) $\dfrac{c^2}{ab}$ sq. units

102. The value of the following expression :

$$\left(\frac{1}{2^2-1}\right)+\left(\frac{1}{4^2-1}\right)+\left(\frac{1}{6^2-1}\right)+\ldots\ldots$$

$$+\left(\frac{1}{20^2-1}\right) \text{ is :}$$

(A) $\dfrac{10}{21}$ (B) $\dfrac{13}{27}$

(C) $\dfrac{15}{22}$ (D) $\dfrac{22}{15}$

103. Find the value of the expression $1-6+2-7+3-8+\ldots\ldots$ to 100 terms.

(A) -250 (B) -500

(C) -450 (D) -300

104. A bag contains 12 balls of the two different colours out of which x are white. One ball is drawn at random. If 6 more white balls are put in a bag, the probability of drawing a white ball now will be doubled to that of previous probability of drawing a white ball. The value of x is :

(A)   4   (B)   5

(C)   6   (D)   3

105. The roots of the equation $x^{2/3}+x^{1/3}-2=0$ are :

(A)   1, -8 (B) $-1, -2$

(C) $\dfrac{2}{3}, \dfrac{1}{3}$ (D) $-2, -7$

106. The sum of first n terms of an A.P. whose first term is π is zero. The sum of next m terms is :

(A) $\dfrac{\pi m(m+n)}{n-1}$

(B) $\dfrac{\pi n(m+n)}{1-n}$

(C) $\dfrac{\pi m(m+n)}{1-n}$

(D)   1

107. If $Sinx + Sin^2x = 1$ then $Cos^8x + 2Cos^6x + Cos^4x$ equals to :

(A)   0   (B) -1

(C)   1   (D)   2

108. If $x^a = y^b = z^c$ and $y^2 = zx$ then the value of $\dfrac{1}{a} + \dfrac{1}{c}$ is :

(A) $\dfrac{b}{2}$

(B) $\dfrac{c}{2}$

(C) $\dfrac{2}{b}$

(D) $\dfrac{2}{a}$

109. If $x = \dfrac{\sqrt{p^2+q^2} + \sqrt{p^2-q^2}}{\sqrt{p^2+q^2} - \sqrt{p^2-q^2}}$ then

$q^2x^2 - 2p^2x + q^2$ equals to :

(A) 3

(B) -1

(C) -2

(D) 0

110. If $(-4, 0)$, $(1, -1)$ are two vertices of a triangle whose area is 4 Sq units then its third vertex lies on :

(A) $y = x$

(B) $5x + y + 12 = 0$

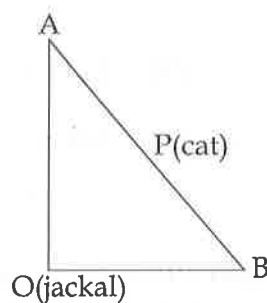(C) $x + 5y - 4 = 0$

(D) $x - 5y + 4 = 0$

111. How many litres of a 3% hydrogen peroxide solution should be mixed with 6 litres of a 30% hydrogen peroxide solution so as to get a mixture of 12% solution ?

(A) 3 litres

(B) 6 litres

(C) 9 litres

(D) 12 litres

112. A train travelling from Delhi to Ambala meets with an accident after 1 hr. It is stopped for $\dfrac{1}{2}$ hr, after which it proceeds at four-fifth of its usual rate, arriving at Ambala at 2 hr late. If the train has covered 80 km more before the accident, it would have been just 1 hr late. The usual speed of the train is :

(A) 20 km/hr

(B) 30 km/hr

(C) 40 km/hr

(D) 50 km/hr

113. A train enters into a tunnel AB at A and exits at B. A jackal is sitting at O in another by passing tunnel AOB, which is connected to AB at A and B, where OA is perpendicular to OB. A cat is sitting at P inside the tunnel AB making the shortest possible distance between O and P, such that AO = 30 km and PB = 32 km. When a train before entering into the tunnel AB makes a whistle somewhere before A, the jackal and cat run towards A, they meet with accident at the entrance A. The ratio of speeds of jackal and cat is :

(A) $\dfrac{2}{3}$

(B) $\dfrac{4}{3}$

(C) $\dfrac{5}{3}$

(D) $\dfrac{3}{2}$

114. $Sin^{-1}\left(\dfrac{3}{5}\right)+tan^{-1}\left(\dfrac{1}{7}\right)=$

(A) $\dfrac{\pi}{4}$

(B) $\dfrac{\pi}{2}$

(C) $Cos^{-1}\left(\dfrac{4}{5}\right)$

(D) π

115. In the following system of equations $2^{y-x}(x+y)=1$ & $(x+y)^{x-y}=2$ the value of xy is :

(A) $\dfrac{1}{2}$

(B) $\dfrac{3}{4}$

(C) $\dfrac{1}{4}$

(D) 1

116. A dog at point A goes in pursuit of a fox 30 m away. The dog makes 2 m and the fox, 1 m long leaps. If the dog makes two leaps to the fox's three, at what distance from A will the dog catch up with the fox ?

(A) 100 m

(B) 110 m

(C) 105 m

(D) 120 m

117. If 5 spiders can catch 5 flies in 5 minutes. How many flies can 100 spiders catch in 100 minutes :

(A) 100

(B) 1000

(C) 500

(D) 2000

118. $\left(\dfrac{1}{1-x}+\dfrac{1}{1+x}+\dfrac{2}{1+x^2}+\dfrac{4}{1+x^4}+\dfrac{8}{1+x^8}\right)$ equals to :

(A) 1

(B) 0

(C) $\dfrac{8}{1-x^8}$

(D) $\dfrac{16}{1-x^{16}}$

119. The image of the point (3, 8) in the line $x+3y=7$ is :

(A) (1, 4)

(B) (4, 1)

(C) (−1, −4)

(D) (−4, −1)

120. Find the value of x satisfying :
$log_{10}(2^x+x-41)=x(1-log_{10}5)$

(A) 40

(B) 41

(C) −41

(D) 0

Section E — Attitude & Leadership

Choose the most appropriate option.

(Q.No. 121 to 150)

121. _____ is the definition of reference groups.

(A) Groups that an individual looks to when forming attitudes and opinions

(B) Groups of people who have been referred to by someone they know

(C) Groups of office colleagues

(D) Chat groups on the internet

122. According to Mintzberg, one of management's interpersonal roles is _____.

Select **correct** option :

(A) Spokesperson

(B) Leader

(C) Negotiator

(D) Monitor

123. Which of the following represent the three components of attitudes ?

(A) primary, secondary and tertiary

(B) knowledge, value-expressive and utilitarian

(C) cognitive, affective, and behavioral

(D) cognitive, value-expressive, and behavioral

124. Which of these is **not** a principle of great man theory ?

(A) Leaders are born not made

(B) Great men rise up in times of crisis

(C) We can learn from the biographies of great leaders

(D) A great leader is only great in certain situations

125. An investigator who wishes to study the attitudes of people in Illinois identifies 1,000 people in Illinois, taking care that the percentages of male and female, black and white, young and old are the same in the sample as in state's total population. What kind of sample is the investigator trying to obtain ?

(A) an independent sample

(B) a dependent sample

(C) a random sample

(D) a representative sample

126. _____ portrays the "whole person" interacting with his or her environment.

(A) Attitude

(B) Personality

(C) Lifestyle

(D) Self-concept

127. Michael is a type of manager who is concerned primarily with accomplishing goals and objectives and concentrates on the task itself. His behavioral style is called :

(A) authoritarian

(B) democratic

(C) task oriented

(D) people oriented

128. Which of the following is a component of Mary's attitude toward smoking ?

(A) Mary believes smoking is harmful to one's health

(B) Mary dislikes the fact that people are permitted to smoke in vehicles of public transportation

(C) Mary is actively working for legislation which would outlaw the sale of cigarettes

(D) all of the above are part of Mary's attitude toward smoking

129. The capacity to influence people and accomplish desired objectives is called :

(A) Power   (B) Leadership

(C) Authority   (D) Status

130. Frustration arises from the gap between _____ and _____.

(A) belief; behavior

(B) learning; behaviour

(C) expectations; attainments

(D) behaviour; attitudes

131. According to the text, Lee Iococca of Chrysler and Pat Farrah of Home Depot exhibited what type of leadership ?

(A) Transactional

(B) Transformational

(C) Autocratic

(D) Contingency

132. What is post-heroic leadership theory ?

(A) A theory which states that there is too much emphasis on leaders and more attention should be placed on followers

(B) A theory looking beyond current leadership styles to new, more creative ways of leading

(C) A theory which tries to create new organizations which do not need leaders

(D) A theory which tries to find the ideal form of leadership

133. For the Ohio State leadership studies the perfect leader :

(A) Combines a focus on the task and the employee

(B) Focuses on the task and getting things done

(C) Inspires workers to aim higher and achieve more

(D) Is concerned about the small details and how to increase productivity

134. Leadership is _____ .

    (A)   the process of influencing a group toward the achievement of goals

    (B)   a group that achieves goals

    (C)   the function of influencing a group towards the achievement of goals

    (D)   directing a group towards the achievement of goals

135. Contingency theory is based on the assumption that the ideal leader :

    (A)   Shapes their leadership style depending on the situation

    (B)   Provides clear instructions to the followers so that they know what they are doing

    (C)   Knows what their strengths are and makes the most out of them

    (D)   Spends time with their followers and therefore listens and responds to their needs

136. A leadership theory that focuses on the traits of those who have assumed powers and who are considered to be effective is called :

    (A)   trait theories

    (B)   behavioral theories

    (C)   contingency theories

    (D)   structural theories

137. What is the social construction of leadership ?

    (A)   The view that all leadership is social and what matters is how leaders interact with others

    (B)   Leadership is a made up idea that therefore we should pay more attention to more significant aspects of the organization.

    (C)   What counts as good leadership is a construction of the perceptions of the followers

    (D)   Leadership is something that the leader constructs as they meet with others

138. A student states that he supports gun ownership by individuals. In speech class, his teacher assigns him to present a persuasive speech on abolishing gun ownership by individuals. After arguing the opposing side, he finds his initially favorable attitude is changing. This can best be explained by :

    (A)   attitude incongruity

    (B)   the attitude-behavior dissimilarity theory

    (C)   attitude inoculation

    (D)   cognitive dissonance theory

139. A transactional leader is one who :

(A) Inspires people and has strong interactions with them

(B) Does deals with people in order to get them to do things the leader wants

(C) Is the ideal form of leadership

(D) Works for long-term goals of the organization

140. When our behavior is out of sync with our attitudes it is called :

(A) attitude incongruity

(B) the attitude-behavior dissimilarity theory

(C) attitude inoculation

(D) cognitive dissonance

141. The ability to influence people through granting or withholding benefits that are of interest to them is called :

(A) reward power

(B) coercive power

(C) export power

(D) reference power

142. _____ is that part of an attitude that's made up of the beliefs, opinions, knowledge or information held by a person.

(A) Behavioural component

(B) Cognitive component

(C) Affective component

(D) None of the above

143. Coercive power may occur in which of the following organizations ?

(A) service firm

(B) non-profit organization

(C) manufacturing firm

(D) all of the above

144. People who act like "social chameleons" — those who seem to change behavior and attitudes to fit every situation they're in — are generally considered :

(A) low self-monitors

(B) high self-monitors

(C) to be using the self-serving bias

(D) high in self-efficacy

145. Feelings or emotional reactions to an object reflect the _____ component of an attitude.

    (A) knowledge   (B) cognitive

    (C) affective   (D) behavioral

146. _____ has become increasingly important for developing a marketing strategy in recent years.

    (A) Change in consumers' attitudes

    (B) Inflation of the dollar

    (C) The concept and the brand

    (D) Age groups, such as the teen market, baby boomers, and the mature market

147. The emotional part of an attitude is called _____.

    (A) Affective component

    (B) Attitude

    (C) Behavioural component

    (D) All of the above

148. Persuasion is :

    (A) the process by which a message induces attitude change

    (B) a change in behavior or belief as a result of real or imagined group pressure

    (C) the process by which a message induces a change in behavior

    (D) a change in behavior or belief as a result of a direct order from someone

149. A leadership theory that postulates that an effective leader is one who develops a variety of leadership styles, and in each situation applies the style that best fits the circumstance.

    (A) Vroom-Jago model

    (B) Path goal theory

    (C) LPC theory

    (D) None of the above

150. Self-perception theory argues that people will adopt attitudes consistent with behaviors in order to :

    (A) figure out the dominant response

    (B) reduce tension

    (C) determine how they should behave

    (D) create good impressions

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