CA FOUNDATION

Test Code – JK-QA-03

(Date: 04-10-2020)

(Marks - 100)

Write the most appropriate answer to each of the following multiple choice questions by choosing one of the four options given. All questions are compulsory.

Section A - Business Mathematics

1. If $(a + b) : (a – b) = 1 : 5$, then $(a^2 – b^2) : (a^2 + b^2)$ equals:

(a) 2 : 3 (b) 3 : 2

(c) 5 : 13 (d) 13 : 5

2. Two vessels containing water and milk in the ratio 2 : 3 and 4 : 5 are mixed in the ratio 1 : 2. The ratio of milk and water in the resulting mixture.

(a) 58 : 77 (b) 77 : 58

(c) 68 : 77 (d) None

3. Which ratio of the following ratios is greater $2\frac{1}{3} : 3\frac{1}{3}$ and 3.6 : 4.8

(a) $2\frac{1}{3} : 3\frac{1}{3}$ (b) 3.6 : 4.8

(c) Both are equal (d) None

4. The square root of ½ $[x + \sqrt{x^2 - y^2}\,]$ is giving by

(a) $\frac{1}{2}[\sqrt{x + y} + \sqrt{x - y}]$ (b) $\frac{1}{2}[\sqrt{x + y} - \sqrt{x - y}]$

(c) $[\sqrt{x + y} + \sqrt{x - y}]$ (d) $[\sqrt{x + y} - \sqrt{x - y}]$

5. The value of $\frac{(243)^{0.13} \times (243)^{0.07}}{(7)^{0.25} \times (49)^{0.075} \times (343)^{0.2}}$ is:

(a) $\frac{3}{7}$ (b) $\frac{7}{3}$

(c) $1\frac{3}{7}$ (d) $2\frac{2}{7}$

6. If $m = b^x$, $n = b^y$ and $(m^y n^x)^z = b^2$ the value of xyz is given by

(a) – 1 (b) 0

(c) 1 (d) None

7. Final the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$ if $x = 3 + 2\sqrt{2}$

(a) 1 (b) 2

(c) 3 (d) None

8. Find $\log_{3/2} 3.375$

(a) 2 (b) 3

(c) 5/2 (d) 17/2

9 If $m^x = n^y = r^z = s^w$, then $\log_m (nrs)$ =

(a) $\frac{1}{x}\left(\frac{1}{y} + \frac{1}{z} + \frac{1}{w}\right)$ (b) $x\left(\frac{1}{y} + \frac{1}{z} + \frac{1}{w}\right)$

(c) $\frac{y + z + w}{x}$ (d) None of these

10. The value of k for which the following system of equations has a unique solution: $x – 2y = 3$, $5x + ky + 7 = 0$

(a) $K \neq 10$ (b) $K = 10$

(c) K is any real number (d) None of these

11. If the numerator of a fraction is multiplied by 2 and denominator is reduced by 5 the fraction becomes 6/5, and if the denominator is doubled the numerator is increased by 8, the fraction becomes 2/5. Find the fraction.

(a) $\frac{12}{25}$ (b) $\frac{3}{10}$

(c) $\frac{4}{7}$ (d) None of these

12. Father's age is three times the sum of age his two children after 5 years his age will be twice the sum of ages of two children. Find the age of father.

(a) 58 (b) 45

(c) 64 (d) None of these

13. Solutions of the quadratic equation $4x^2 - 4ax + a^2 - b^2 = 0$ are

(a) $a \pm 2b$ (b) $2a \mp b$

(c) $\frac{a \pm b}{2}$ (d) None of these

14. Solutions. of the equation $x^{2/3} - 2x^{1/3} = 15$ are

(a) 125, – 27 (b) 25, – 3

(c) – 5, 3 (d) None

15. A train travels a distance of 300km at constant speed. If the speed of the train is increased by 5km an hour, the Journey would have taken 2 hours less. Find the original speed of the train.

(a) 25km/hr (b) 36km/hr

(c) 20km/hr (d) None

16. If twice the area of a smaller square is subtracted from the area of a large square, the result is $14cm^2$. However, if twice the area of the larger square is added to three times the area of the smaller square, the result is $203cm^2$. Determine the sides of square.

(a) 5cm. 8cm (b) 8cm, 6cm

(c) 5cm, 10cm (d) None

17. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$ and $4A - 3B + C = 0$ then C =

(a) $\begin{bmatrix} 2 & -1 \\ 0 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 2 & 1 \\ 1 & -1 \end{bmatrix}$

(c) $\begin{bmatrix} -2 & 1 \\ 0 & -1 \end{bmatrix}$ (d) None

18. If $A = \begin{bmatrix} a & p \\ b & q \\ c & r \end{bmatrix}_{3\times 2}$ then DET (AA^T) is equal to

(a) 0 (b) $a^2 + b^2 + c^2$

(c) $p^2 + q^2 + r^2$ (d) Σap

19. If $A = \begin{bmatrix} 3 & 4 \\ 2 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -2 & -2 \\ 0 & -2 \end{bmatrix}$ then $(A + B)^{-1} =$

(a) does not exist (b) $A^{-1} + B^{-1}$

(c) skew symmetric (d) None

20. A firm makes two types of products : type A and Type B. The profit on product A ₹ 20 each and that on product B is ₹ 30 each. Both types are processed on machines M_1, M_2 and M_g. the time required in hours by each product and total time available in hours per week on each machine are as follows:

Machine	Product A	Product B	Available Time
M_1	3	3	36
M_2	5	2	50
M_3	2	6	60

The Constraints can be formulated by taking x_1 = number of units A and x_2 – number of unit B as

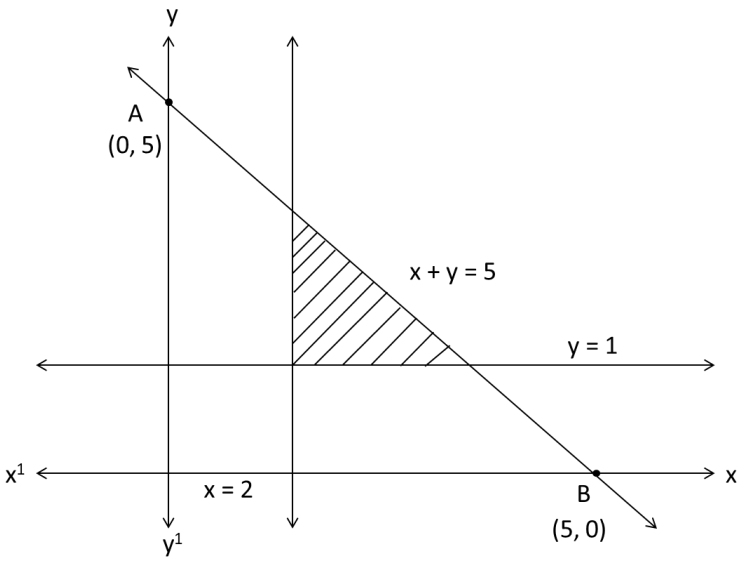
(a) $x_1 + x_2 \leq 12$
$5x_1 + 2x_2 \geq 50$
$2x_1 + 6x_2 \leq 60$
$x_1 \geq 0, x_2 \geq 0$

(b) $3x_1 + 3x_2 \geq 36$
$5x_1 + 2x_2 \leq 50$
$2x_1 + 6x_2 \geq 60$
$x_1 \geq 0, x_2 \geq 0$

(c) $3x_1 + x_2 \leq 36$
$5x_1 + 2x_2 \leq 50$
$2x_1 + 6x_2 \leq 60$
$x_1 \geq 0, x_2 \geq 0$

(d) None of these

21. The shaded region represents:



(a) $x + y \leq 5; x \geq 2; y \leq 1$ (b) $x + y \leq 5; x \geq 2; y \geq 1$

(c) $x + y \geq 5; x \geq 2; y \geq 1$ (d) None of these

22. A person deposited a sum of ₹1,00,000 in a bank. After 2 years, he withdraw ₹40,000 and at the end of 5 years the received an amount of ₹75,200. Find the rate of simple interest.

(a) 4% (b) 6%

(c) 7% (d) 8%

23. Find the present value of ₹2,000 due in 6 years if money is worth 5% compounded semi- annually.

(a) 5000 (b) 1994

(c) 1487.11 (d) None

24. A person deposited ₹5,000 in a bank. The deposit was left to accumulate at 6% compounded quarterly for the first five years and at 8% compounded semiannually for the next eight years. The compounded amount at the end of 13 years is:

(a) ₹12621.50 (b) ₹12613.10

(c) ₹13613.10 (d) None

25. Amit buys a house paying ₹50,000 in cash and the balance in 20 instalments of ₹8000 each at the end of each year. If interest be reckoned at 16%, how much he should have paid if had purchased it cash down.

(a) ₹85250 (b) ₹97430
(c) ₹72002.75 (d) None of these

26. Out 20,000 staff 48% preferred pepsi 54%, Limea and 64% fanta of the total 28% used pepsi and Limea 32% Limea and fanta and 30% pepsi and fanta. Only 6% did none of these Find the number having all the three.

(a) 3600 (b) 2800
(c) 1600 (d) None

27. A debts of ₹5000 with interest at the rate of 8% compounded quarterly is to be discharged by 8 equal quarterly payments, the first being due today. Find the size of each payment.

(a) ₹573.86 (b) ₹669.17
(c) ₹399.26 (d) None of these

28. If $f(x) = \frac{2 + x}{2 - x}$, then $f^{-1}(x)$:

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

29. How much amount is required to be invested every year as to accumulate ₹6,00,000 at the end of 10^{th} year. if interest is compounded annually at 10% rate of interest?

(a) ₹37,467 (b) ₹37.476
(c) ₹37,647 (d) ₹37,674

30. How long will it take for a principle to double if money is worth 12% compounded monthly?

(a) 4.25 yrs (b) 5.81 years
(c) 6 yrs (d) None of these

31. A trader borrowed ₹40,000 from two money lender. For one loan he paid 12% and for the other 14% per annuum. After one year, he paid ₹5100 as interest. How much did he borrow at thee rates?

(a) ₹25,000 and ₹15,000 respectively.
(b) ₹30,000 and ₹10,000 respectively
(c) ₹28,000 and ₹12,000 respectively
(d) ₹20,000 each from both.

32. In how many ways of the word ''MATHEMATTICS'' can be arranged so that the vowels always occur together?

(a) $111 \div (21)^3$ (b) $(8! \times 4!) \div (2!)^3$
(c) $121 \div (21)^3$ (d) None

33. The number of diagonals in a decagon is:

(a) 32 (b) 35
(c) 50 (d) None

34. If $\frac{1}{9!} + \frac{1}{10!} + \frac{x}{11!}$ .The value of x is:

(a) 211 (b) 122
(c) 121 (d) None

35. A candidates is requires to answer 6 out of 10 questions, which are divided into two groups each containing 5 question and he is not permitted to attempt more than 4 from each group. In how many ways can he make up his choice?

(a) 300 (b) 200
(c) 400 (d) None of these

36. The sum of the equidistant terms from both ends in an AP is equal is equal to _____ of the AP.

(a) First term (b) last term
(c) Sum of first and last term (d) None of these

37. If $y = \sqrt{\frac{x}{a}} + \sqrt{\frac{a}{x}}$, then $(2xy)\ \frac{dy}{dx} = ?$

(a) $\frac{x}{a} - \frac{a}{x}$ (b) $\frac{x}{a}$

(c) $-\frac{a}{x}$ (d) None of these

38. If $e^y = y^x$, then $\frac{dy}{dx}$ is :

(a) $\frac{\log y}{\log y - 1}$ (b) $\frac{(\log y)^2}{\log y - 1}$

(c) $\frac{\log y}{(\log y - 1)^2}$ (d) None

39. $\int \frac{8x^2}{(x^3 + 2)^3} dx$ is equal to :

(a) $\frac{-4}{3}(x^3+2)^2 + C$ (b) $\frac{-4}{3}(x^3+2)^{-2} + C$

(c) $\frac{4}{3}(x^3+2)^2 + C$ (d) None of these

40. $\int_1^2 \frac{[\text{Log}_e(ex)]^n}{x} dx =$ (where $n \neq -1$)

(a) $\frac{[\text{Log}2e]^{n+1}}{n+1}$ (b) $\frac{[\text{Log}2e]^{n+1}}{n+1} - \frac{\text{Log}e}{n+1}$

(c) $\frac{[\text{Log}2e - \text{Log}2]^{n+1}}{n+1}$ (d) None of these

Section B – Logical Reasoning

41. Find odd man out of the following : 2,3,5,7,11,13,17

(a) 2 (b) 11

(c) 7 (d) 13

42. ____ ____ aba ___ ___ b a ___ ab

(a) abbba (b) abbab
(c) baabb (d) bbaba

43. In a certain code language, '617' means 'sweet and hot' '735' means 'coffee is sweet' '263' means 'tea is hot' which of the following would mean 'coffee is hot'?

(a) 731 (b) 536
(c) 367 (d) 753

44. Munna start from a point, walk 4km, towards north and turns left and walks 6km, turns right and walks for 3km and again turns right and walks 4km and takes rest for 1 hour. He gets up and walks straight 2km in the same direction and turns right and walks 1km. The direction in which he is facing is _____

(a) West (b) North
(c) South (d) South – East

45. A cat is facing North and it moves 2m, then it turned to its right and moves 2m and then it moves 1m in North- East, then it turned to its right and moves 2m and again it turned to its left and moves 2m. In which direction is the cat facing?

(a) South - East (b) North - East
(c) South - West (d) North – West

46. A driver drives 25kms towards North. He then turns left and drives 40kms. He again turns left and covers 25kms. Further he drives 20kms after tuning to the right. How far is he from his original portion?

(a) 25 kms (b) 45 kms
(c) 110 kms (d) 60 kms

Note: Direction (Q.No.47 – 49: Study the following information carefully to answer the given questions.

Eight persons P to W are sitting in front of one another in two rows. Each row has four persons P is between U and V and facing North. Q, who is to the immediate left of M is facing W. R is between T and M and W is to the immediate right of V.

47. Who is sitting in front of R?

(a) U (b) Q
(c) V (d) P

48. Who is to immediate right of R?

(a) M (b) U
(c) M or V (d) None of these

49. In which of the following pairs, persons are sitting in front of each other?

(a) MV (b) RV
(c) TB (d) UR

50. A is the sister of B, B is the brother of C. C is the son of D. How D is related to A?

(a) Son (b) Mother
(c) Daughter (d) Uncle

51. Preeti has a son, named Arun, Ram is Preeti's brother Neeta too has a daughter named Reema, Neeta is Ram's sister. What is Arun's relationship to Reema?

(a) Brother (b) Nephew
(c) Cousin (d) Uncle

52. Pointing to a lady in a photograph. Meera said ''Her father's only son's wife is my mother-in-law'. How is Meera's husband related to that lady in the photo?

(a) Nephew (b) Uncle
(c) Son (d) Father

53. Pappu is searching his mother. He went 9 metres in the east before turning to his right. He went 2 metres before turning to his right again to look for his mother at his uncle's place 3 metres from this point. His mother was not there, From there, he went 10 metres to his north before meeting in a street. How far did the son meet his mother from starting point?

(a) 8m (b) 10m
(c) 14m (d) None

54. B is R's neighbour and his house is 2kms away in the North – west direction. J is R's neighbour and his house is located 2kms away in the south-west direction. G is J's neighbour and he stay 2 kms away in the south – east direction. P is G's neighbour and his house is located 2 kms away in the north – east direction. The position of P's house with respect to B's is …….?

(a) North (b) North - east
(c) South - east (d) South – west

55. Six persons A,B,C,D,E and F are standing in a circle B is between D and C and A between E and C . F is the right of D. Who is between A and F?

(a) B (b) C
(c) D (d) E

Note: Answer : (a) if only I follows : (b) if only conclusion II follows ; (c) if either I or II follows ; (d) if neither I nor II follows ; (e) If both I and II Follow.

56. **Statement:** All bulbs are glasses
All glasses are books
Conclusion: I. All bulbs are books
II. All glasses are pots

57. **Statement:** All men are cats
No cats are home
Conclusion: I. Some men are home
II. Some home are cats

58. **Statement:** All cars are cats
All fans are cats
Conclusion: I. All cars cars fans
II. Some fans are cars.

59. Find odd man out of the following : 1,4,9,16,19,36,49,64,81

(a) 9 (b) 19
(c) 49 (d) 16

60. If MACHINE is coded as 19-7-9-14-15-20-11, how will you code DANGER?

(a) 11 – 7 – 20 – 16 – 11 – 24 (b) 13 – 7 – 20 – 16 – 11 – 25

(c) 10 – 7 – 20 – 13 – 11 – 24 (d) 13 – 7 – 20 – 10 – 11 – 24

Section C - Statistics

61. When data are arranged at regular intervals of time, the classification is called?

(a) Qualitative (b) Quantitative

(c) Chronology (d) Geographical

62. The extreme value used to describe the different classes in a frequency distribution are called?

(a) Class intervals (b) Class Boundaries

(c) Class limits (d) Cumulative frequency

63. A comparison of frequencies of class interval is possible only in……

(a) Ogives (b) frequency polygon

(c) Histogram (d) All of these

64. Normally mutually inclusive classification is relates to

(a) A continuous variable (b) An attribute

(c) A discrete variable (d) All these

65. The column heading of a table are known as:

(a) Body (b) Stub

(c) Box - head (d) Caption

66. These were 200 employees in an office in which 150 were married. Total male employees were 160 out of which 120 were married. What was the number of female unmarried employees?

(a) 30 (b) 10

(c) 40 (d) 50

67. Any measure indicating the centre of a set of data, arranged in an increasing or decreasing order of magnitude, is called a measure of:

(a) Skewness (b) Symmetry

(c) Central Tendency (d) Dispersion

68. G.M is defined only with……

(a) all observation have the different sign and none is zero
(b) all observation have the same sign and one is zero
(c) all observation have the different sign and one is zero
(d) all observation have the same sign and none is zero

69. In ABC limited, mean weight gents workers is 80kg. and mean weight of lady workers is 50kg. If the mean weight of all the workers taken together is 60kg, then the ratio of the number of gents to that of lady workers is:

(a) 2 : 3 (b) 2 : 1
(c) 1 : 2 (d) None of these

70. Geometric mean of 2, 2^2, 2^3, ….. 2^n is

(a) $2^{\frac{n+1}{2}}$ (b) $2^{\frac{2n-1}{2}}$
(c) $2^{\frac{3n}{2}}$ (d) None

71. The measures used to calculate the variation, present among the observations, in the unit of the variable is called.

(a) Relative measures of dispersion
(b) Coefficient of skewness
(c) Absolute measures of dispersion
(d) Coefficient of variation

72. The degree to which numerical data tend to spread about an average value called:

(a) Constant (b) Fitness
(c) Variation (d) Skewness

73. The variance of α, β and γ is 16, then variance of 5α, 5β and 5γ is:

(a) 400 (b) 9/5
(c) 256 (d) 225

74. The arithmetic mean and the standard deviation of a set of 9 items are 43 and 5 respectively. If an item of value 63 is added to the set the mean and standard deviation of all the 10 items is:

(a) 45, 7.56 (b) 40,5.65

(c) 48, 6.5 (d) None of these

75. If A and B are two events such that P $(A \cap B) = 0$ then

(a) A and B always independent

(b) A and B maybe independent

(c) A and B cannot be independent

(d) A and B cannot be equally likely

76. $P(B/A) = \frac{P(A \cap B)}{P(A)}$ is defined iff.

(a) B is an impossible event

(b) A is a sure event

(c) B is a sure event

(d) A is not an impossible event.

77. What is the probability of having attest one 'are' from 4 throws of a perfect dice?

(a) $(5/6)^4$ (b) $1 - (1/6)^4$

(c) $1 - (5/6)^4$ (d) None

78. One ₹5 coin and another ₹10 coin were tossed together. What is the probability that the ₹10 win would show a tail given that the ₹5 coin has shown a head?

(a) 0.45 (b) 0.50

(c) 0.54 (d) None

79. $P(A) = 2/3$; $P(B) = 3/5$; $P(A \cup B) = 5/6$. Find P(B(A)

(a) 11 / 20 (b) 13/20

(c) 13/18 (d) None

80. A random variable x takes three values –1,2,3, with the respective probabilities $P(-1) = 1/3$, $P(2) = 1/3$, $P(3) = 1/3$, then E |X| is

(a) 3/2 (b) –5/2

(c) 2 (d) 9/2

81. If x ~ B (5,p) and P(x = 2) = 0.4362 and P(x = 3) = 0.2181 then P =

(a) 3/4 (b) 1/3

(c) 2/3 (d) 1/4

82. For Binomial distribution

(a) Variance < Mean (b) Variance = Mean

(c) Variance > Mean (d) None of the above

83. 5000 students were appeared in an examination. The mean of marks was 39.5 with standard deviation 12.5 marks. Assuming the distribution to be normal, find the number of student recorded more than 60% marks.

[Given when Z = 1.64 area of normal wave = 0.4494]

(a) 1000 (b) 505

(c) 253 (d) 2227

84. The mean and the variance of a random variable x having the probability density function $P(X = X) = \text{Exp. } \{-(x-4)^2\}/\sqrt{\pi}, -\infty < x < \infty$ is

(a) 4, $1/2$ (b) 4, $1/\sqrt{2}$

(c) 2, 2 (d) 2, $1/2$

85. A drug manufacturer, who produces medicine bottle, finds that 0.1% of the bottles are defective. The bottles are packed in boxes contained 500 bottles. A during manufacturer buys 100 boxes from the procedure of bottles. Using Poisson Distribution, find how many boxes will contains atleast two defectives:

[Given $e^{-0.5} = 0.6065$]

(a) 7 (b) 13

(c) 9 (d) 11

86. If variable are dependent the correlation coefficient may be zero.

(a) True (b) False

(c) Both A and B (d) None of these

87. Coefficient of correlation between observations (1 ; 7) ; (2 ; 6) ; (3 ; 5) ; (4 ; 4) ; (5 ; 3) ; (6 ; 2) ; (7 ; 1) is

(a) 1 (b) – 1

(c) 0 (d) None

88. If the magnitude of the two variables are not taken under discussion, then we consider_____

(a) Product moment correlation Coefficient

(b) Rank correlation Coefficient

(c) Coefficient of concurrent deviation

(d) Either (a) or (b) but not (c)

89. If the value of correlation Coefficient is positive, then the points in a seatler diagram tend to duster.

(a) from lower right corner to upper right corner

(b) from lower left corner to upper right corner

(c) from lower right corner to upper left corner

(d) None

90. If the two variables x and y of a bivariate distribution have a perfect correlation, they may be connected by:

(a) $\frac{x}{m}+\frac{y}{n}=1$ (b) $xy = 1$

(c) $\frac{m}{x}+\frac{n}{y}=1$ (d) None of these

91. What is the coefficient of concurrent deviations for the following data:

Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Price	135	138	140	133	145	148	149	152
Demand	226	235	231	236	230	229	227	224

(a) – 1 (b) 0.43

(c) 0.5 (d) $\sqrt{2}$

92. What are the limits of the regression coefficients?

(a) Both positive or both negative
(b) Must be positive
(c) No limit
(d) one positive and other negative

93. If the relationship between two variables x and u is u + 3x + 15 = 0 and between two other variables y and v is 2y + 5v = 23, and regression coefficient of y on x is known as 0.80, what would be the regression coefficient of v on u?

(a) $\frac{8}{75}$ (b) $\frac{75}{8}$
(c) $\frac{-8}{75}$ (d) None

94. The regression equation of two variables x and y are as follows: 3x+ 2y = 26; 6x+ y = 31. The coefficient of correlation is:

(a) – 0.25 (b) – 0.5
(c) – 0.61 (d) None

95. This index number which is arithmetic mean of Laspeyre's and Paasche's index numbers is _____

(a) Kelly's Index (b) Dorbish & Bobey's Index
(c) Fisher's Index (d) None of the above

96. Circular test is satisfied if.

(a) $P_{01} \times P_{12} \times P_{20} = 1$ (b) $P_{01} \times P_{12} \times P_{22} = 1$
(c) $P_{10} \times P_{12} \times P_{20} = 1$ (d) None

97. In 2015 the net monthly income of the employee was ₹1000/- p.m. the consumer price index number was 160 in 2015. It rises to 200 in 2018. If he has to be rightly compensated.

The additional D.A. to be paid to the employee is

(a) ₹200/- (b) ₹285/-
(c) ₹250/- (d) None

98. The graph of time series is called:

(a) Ogive (b) Histogram

(c) Straight line (d) Historigram

99. For the following data:

Year	**2012**	**2013**	**2014**	**2015**	**2016**
Wages (₹)	2250	2500	3000	2700	3500

The wages of 4 yearly moving average centered value of the year 2014 is.

(a) ₹2768.75 (b) ₹2865.25

(c) ₹3122.50 (d) None

100. For the following data:

Year	**2015**	**2016**	**2017**
Sale (₹)	40	55	80

The linear trend line of the data is _____

(a) $Y_t = 58.33 + 20x$ (b) $Y_t = 73.75 + 15x$

(c) $Y_t = 46 + 12x$ (d) None