Assignment

Mean

Basic Level

1. If the mean of 3, 4, x, 7, 10 is 6, then the value of x is

(a) 4 (b) 5 (c) 6 (d) 7

2. The mean of a set of numbers is $\bar{x}$. If each number is multiplied by λ, then the mean of new set is

(a) $\bar{x}$ (b) $\lambda + \bar{x}$ (c) $\lambda\bar{x}$ (d) None of these

3. The mean of discrete observations $y_1, y_2, \ldots\ldots, y_n$ is given by **[DCE 1999]**

(a) $\frac{\sum_{i=1}^{n} y_i}{n}$ (b) $\frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} i}$ (c) $\frac{\sum_{i=1}^{n} y_i f_i}{n}$ (d) $\frac{\sum_{i=1}^{n} y_i f_i}{\sum_{i=1}^{n} f_i}$

4. If the mean of numbers 27, 31, 89, 107, 156 is 82, then the mean of 130, 126, 68, 50, 1 is **[Pb. CET 1989; Kurukshetra CEE**

(a) 75 (b) 157 (c) 82 (d) 80

5. d_i is the deviation of a class mark y_i from 'a' the assumed mean and f_i is the frequency, if $M_g = x + \frac{1}{\Sigma f_i}(\Sigma f_i d_i)$, then x is

(a) Lower limit (b) Assumed mean (c) Number of observations (d) Class size

6. The mean of a set of observation is $\bar{x}$. If each observation is divided by α, $\alpha \neq 0$ and then is increased by 10, then the n

(a) $\frac{\bar{x}}{\alpha}$ (b) $\frac{\bar{x}+10}{\alpha}$ (c) $\frac{\bar{x}+10\alpha}{\alpha}$ (d) $\alpha\bar{x}+10$

7. If the mean of the numbers $27+x$, $31+x$, $89+x$, $107+x, 156+x$ is 82, then the mean of $130+x, 126+x, 68+x, 50+x, 1+x$ is

[Kerala PET 2001]

(a) 75 (b) 157 (c) 82 (d) 80

8. Consider the frequency distribution of the given numbers

Value :	1	2	3	4
Frequency :	5	4	6	f

If the mean is known to be 3, then the value of f is **[NDA 2001]**

(a) 3 (b) 7 (c) 10 (d) 14

9. If the arithmetic mean of the numbers $x_1, x_2, x_3, \ldots\ldots, x_n$ is $\bar{x}$, then the arithmetic mean of numbers $ax_1+b, ax_2+b, ax_3+b, \ldots\ldots ax_n+b$, where a, b are two constants would be **[NDA Sept. 1998]**

(a) $\bar{x}$ (b) $n a\bar{x}+nb$ (c) $a\bar{x}$ (d) $a\bar{x}+b$

10. The mean of n items is $\bar{x}$. If the first term is increased by 1, second by 2 and so on, then new mean is **[DCE 1998]**

(a) $\bar{x}+n$ (b) $\bar{x}+\frac{n}{2}$ (c) $\bar{x}+\frac{n+1}{2}$ (d) None of these

11. The G.M. of the numbers $3, 3^2, 3^3, ..., 3^n$ is **[Pb. CET 1997]**

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

12. The reciprocal of the mean of the reciprocals of n observations is their **[AMU 1985]**

(a) A.M. (b) G.M. (c) H.M. (d) None of these

13. The harmonic mean of 3, 7, 8, 10, 14 is

(a) $\frac{3+7+8+10+14}{5}$ (b) $\frac{1}{3}+\frac{1}{7}+\frac{1}{8}+\frac{1}{10}+\frac{1}{14}$ (c) $\frac{\frac{1}{3}+\frac{1}{7}+\frac{1}{8}+\frac{1}{10}+\frac{1}{14}}{4}$ (d) $\frac{5}{\frac{1}{3}+\frac{1}{7}+\frac{1}{8}+\frac{1}{10}+\frac{1}{14}}$

14. If the algebraic sum of deviations of 20 observations from 30 is 20, then the mean of observations is **[NDA (Sept.) 2000]**

(a) 30 (b) 30.1 (c) 29 (d) 31

15. The weighted mean of first n natural numbers whose weights are equal to the squares of corresponding numbers is **[Pb. CET 1989]**

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

16. The mean of the values 0, 1, 2,.....,n having corresponding weight ${}^nc_0, {}^nc_1, {}^nc_2, ... , {}^nc_n$ respectively is **[AMU 1990; CET 19**

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

17. If the values $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, ... \frac{1}{n}$ occur at frequencies 1, 2, 3, 4, 5, ... n in a distribution, then the mean is **[NDA 2000]**

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

18. The number of observations in a group is 40. If the average of first 10 is 4.5 and that of the remaining 30 is 3.5, then the average of the whole group is **[AMU 1992; DCE 1996]**

(a) $\frac{1}{5}$ (b) $\frac{15}{4}$ (c) 4 (d) 8

19. A student obtain 75%, 80% and 85% in three subjects. If the marks of another subject are added, then his average cannot be less than **[NDA 2000]**

(a) 60% (b) 65% (c) 80% (d) 90%

20. The mean age of a combined group of men and women is 30 years. If the means of the age of men and women are respectively 32 and 27, then the percentage of women in the group is **[NDA Sept. 1998]**

(a) 30 (b) 40 (c) 50 (d) 60

21. The mean monthly salary of the employees in a certain factory is Rs. 500. The mean monthly salary of male and female employees are respectively Rs. 510 and Rs. 460. The percentage of male employees in the factory is **[NDA (Sept.**

(a) 60 (b) 70 (c) 80 (d) 90

22. The A.M. of a 50 set of numbers is 38. If two numbers of the set, namely 55 and 45 are discarded, the A.M. of the remaining set of numbers is **[Kurukshetra CEE 1993]**

(a) 38.5 (b) 37.5 (c) 36.5 (d) 36

23. Mean of 100 observations is 45. It was later found that two observations 19 and 31 were incorrectly recorded as 91 and 13. The correct mean is **[NDA 2001]**

(a) 44.0 (b) 44.46 (c) 45.00 (d) 45.54

24. A car completes the first half of its journey with a velocity v_1 and the rest half with a velocity v_2. Then the average velocity of the car for the whole journey is **[AMU 1989; DCE 1995]**

(a) $\frac{v_1+v_2}{2}$ (b) $\sqrt{v_1v_2}$ (c) $\frac{2v_1v_2}{v_1+v_2}$ (d) None of these

25. An automobile driver travels from plane to a hill station 120 *km* distant at an average speed of 30 *km* per hour. He then makes the return trip at an average speed of 25 *km* per hour. He covers another 120 *km* distance on plane at an average speed of 50 *km* per hour. His average speed over the entire distance of 300 *km* will be

(a) $\frac{30+25+50}{3}$ *km/hr* (b) $(30,25,50)^{\frac{1}{3}}$ (c) $\frac{3}{\frac{1}{30}+\frac{1}{25}+\frac{1}{50}}$ *km/hr* (d) None of these

26. The average weight of students in a class of 35 students is 40 *kg*. If the weight of the teacher be included, the average rises by $\frac{1}{2}$ *kg*; the weight of the teacher is **[Kerala (Engg.) 2002]**

(a) 40.5 *kg* (b) 50 *kg* (c) 41 *kg* (d) 58 *kg*

27. If $\overline{X}_1$ and $\overline{X}_2$ are the means of two distributions such that $\overline{X}_1 < \overline{X}_2$ and $\overline{X}$ is the mean of the combined distribution, then

(a) $\overline{X} < \overline{X}_1$ (b) $\overline{X} > \overline{X}_2$ (c) $\overline{X} = \frac{\overline{X}_1 + \overline{X}_2}{2}$ (d) $\overline{X}_1 < \overline{X} < \overline{X}_2$

28. If a variable takes values 0, 1, 2, ..., n with frequencies $q^n, \frac{n}{1}q^{n-1}p, \frac{n(n-1)}{1.2}q^{n-2}p^2, ..., p^n$, where $p + q = 1$, then the mean is

(a) np (b) nq (c) $n(p+q)$ (d) None of these

29. The A.M. of n observations is M. If the sum of $n - 4$ observations is a, then the mean of remaining 4 observations is

(a) $\frac{nM-a}{4}$ (b) $\frac{nM+a}{2}$ (c) $\frac{nM-A}{2}$ (d) $nM + a$

Median

Basic Level

30. Which one of the following measures of marks is the most suitable one of central location for computing intelligence of students **[Kurukshetra CEE 1995]**

(a) Mode (b) Arithmetic mean (c) Geometric mean (d) Median

31. The central value of the set of observations is called

(a) Mean (b) Median (c) Mode (d) G.M.

32. For a frequency distribution 7th decile is computed by the formula

(a) $D_7 = l + \frac{\left(\frac{N}{7} - C\right)}{f} \times i$ (b) $D_7 = l + \frac{\left(\frac{N}{10} - C\right)}{f} \times i$ (c) $D_7 = l + \frac{\left(\frac{7N}{10} - C\right)}{f} \times i$ (d) $D_7 = l + \frac{\left(\frac{10N}{7} - C\right)}{f} \times i$

33. Which of the following, in case of a discrete data, is not equal to the median

(a) 50th percentile (b) 5th decile (c) 2nd quartile (d) Lower quartile

34. The median of 10, 14, 11, 9, 8, 12, 6 is **[Kurukshetra CEE 1997]**

(a) 10 (b) 12 (c) 14 (d) 11

35. The relation between the median M, the second quartile Q_2, the fifth decile D_5 and the 50th percentile P_{50}, of a set of observations is **[AMU 1990]**

(a) $M = Q_2 = D_5 = P_{50}$ (b) $M < Q_2 < D_5 < P_{50}$ (c) $M > Q_2 > D_5 > P_{50}$ (d) None of these

36. For a symmetrical distribution $Q_1 = 25$ and $Q_3 = 45$, the median is

(a) 20 (b) 25 (c) 35 (d) None of these

Advance Level

37. If a variable takes the discrete values $\alpha-4, \alpha-\frac{7}{2}, \alpha-\frac{5}{2}, \alpha-3, \alpha-2, \alpha+\frac{1}{2}, \alpha-\frac{1}{2}, \alpha+5\,(\alpha>0)$, then the median is **[DCE 1997; Pb. CET 1988]**

(a) $\alpha-\frac{5}{4}$ (b) $\alpha-\frac{1}{2}$ (c) $\alpha-2$ (d) $\alpha+\frac{5}{4}$

38. The upper quartile for the following distribution

Size of items	1	2	3	4	5	6	7
Frequency	2	4	5	8	7	3	2

is given by the size of

(a) $\left(\frac{31+1}{4}\right)$th item (b) $\left[2\left(\frac{31+1}{4}\right)\right]$th item (c) $\left[3\left(\frac{31+1}{4}\right)\right]$th item (d) $\left[4\left(\frac{31+1}{4}\right)\right]$th item

Mode

Basic Level

39. For a continuous series the mode is computed by the formula

(a) $l+\frac{f_{m-1}}{f_m-f_{m-1}-f_{m+1}}\times C$ or $l+\left(\frac{f_1}{f_m-f_1-f_2}\right)\times i$ (b) $l=\frac{f_m-f_{m-1}}{f_m-f_{m-1}-f_{m+1}}\times C$ or $l+\frac{f_m-f_1}{f_m-f_1-f_2}\times i$

(c) $l+\frac{f_m-f_{m-1}}{2f_m-f_{m-1}-f_{m+1}}\times C$ or $l+\frac{f_m-f_1}{2f_m-f_1-f_2}\times i$ (d) $l+\frac{2f_m-f_{m-1}}{f_m-f_{m-1}-f_{m+1}}\times C$ or $l+\frac{2f_m-f_1}{f_m-f_1-f_2}\times i$

40. A set of numbers consists of three 4's, five 5's, six 6's, eight 8's and seven 10's. The mode of this set of numbers is **[AMU 1989]**

(a) 6 (b) 7 (c) 8 (d) 10

41. The mode of the following items is 0, 1, 6, 7, 2, 3, 7, 6, 6, 2, 6, 0, 5, 6, 0 **[AMU 1995]**

(a) 0 (b) 5 (c) 6 (d) 2

Relation between mean, median and mode

Basic Level

42. If mean = (3 median – mode) k, then the value of k is

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

43. In a moderately asymmetrical distribution the mode and mean are 7 and 4 respectively. The median is **[NDA Sept. 1998]**

(a) 4 (b) 5 (c) 6 (d) 7

44. If in a moderately asymmetrical distribution mode and mean of the data are 6λ and 9λ respectively, then median is **[Pb. CET 1988]**

(a) 8λ (b) 7λ (c) 6λ (d) 5λ

45. Which of the following is not a measure of central tendency **[Pb. CET 1989]**

(a) Mean (b) Median (c) Mode (d) Range

46. The most stable measure of central tendency is **[AMU 1994]**

(a) Mean (b) Median (c) Mode (d) None of these

47. Which of the following average is most affected of extreme observations **[DCE 1995]**

(a) Mode (b) Median (c) Arithmetic mean (d) Geometric mean

48. The following data was collected from the newspaper : (percentage distribution)

Country	Agriculture	Industry	Services	Others
India	45	19	28	8
U.K.	3	40	44	13
Japan	6	48	43	3
U.S.A.	3	35	61	1

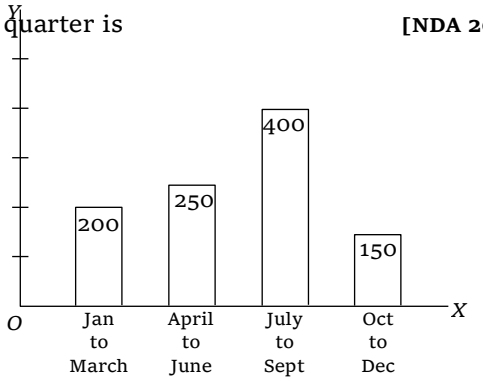
It is an example of **[NDA Sept. 1998]**

(a) Data given in text form (b) Data given in diagrammatic form

(c) Primary data (d) Secondary data

49. The mortality in a town during 4 quarters of a year due to various causes is given below :

Based on this data, the percentage increase in mortality in the third quarter is **[NDA 2000]**



(a) 40

(b) 50

(c) 60

(d) 75

50. A market with 3900 operating firms has the following distribution for firms arranged according to various income groups of workers

Income group	No. of firms
150-300	300
300-500	500
500-800	900
800-1200	1000
1200-1800	1200

If a histogram for the above distribution is constructed the highest bar in the histogram would correspond to the class **[NDA Sept. 1998]**

(a) 500-800 (b) 1200-1800 (c) 800-1200 (d) 150-300

51. The total expenditure incurred by an industry under different heads is best presented as a **[NDA 2000]**

(a) Bar diagram (b) Pie diagram (c) Histogram (d) Frequency polygon

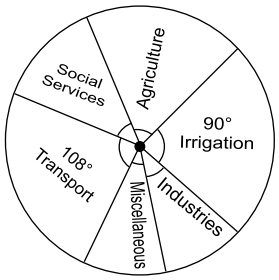
52. The expenditure of a family for a certain month were as follows :

Food – Rs.560, Rent – Rs.420, Clothes – Rs.180, Education – Rs.160, Other items – Rs.120

A pie graph representing this data would show the expenditure for clothes by a sector whose angle equals

(a) 180° (b) 90° (c) 45° (d) 64°

53. Section-wise expenditure of a State Govt. is shown in the given figure. The expenditure incurred on transport is **[NDA (**



(a) 25% (b) 30% (c) 32% (d) 35%

Measures of dispersion

Basic Level

54. The measure of dispersion is **[DCE 1998]**

(a) Mean deviation (b) S.D. (c) Quartile deviation (d) All of these

55. The mean deviation from the median is **[Kurukshetra CEE 1995, 98]**

(a) Greater than that measured from any other value (b) Less than that measured from any other value

(c) Equal to that measured from any other value (d) Maximum if all observations are positive

56. The S.D. of 5 scores 1 2 3 4 5 is **[AMU 1991; DCE 2000]**

(a) $\frac{2}{5}$ (b) $\frac{3}{5}$ (c) $\sqrt{2}$ (d) $\sqrt{3}$

57. The variance of the data 2, 4, 6, 8, 10 is **[AMU 1992]**

(a) 6 (b) 7 (c) 8 (d) None of these

58. The mean deviation of the numbers 3, 4, 5, 6, 7 is **[AMU 1993; DCE 1998]**

(a) 0 (b) 1.2 (c) 5 (d) 25

59. If the standard deviation of 0, 1, 2, 3, ...,9 is K, then the standard deviation of 10, 11, 12, 13 .....19 is

(a) K (b) $K + 10$ (c) $K+\sqrt{10}$ (d) $10K$

60. For a normal distribution if the mean is M, mode is M_0 and median is M_d, then

(a) $M > M_d > M_0$ (b) $M < M_d < M_0$ (c) $M = M_d M_0$ (d) $M = M_d = M_0$

61. For a frequency distribution mean deviation from mean is computed by **[DCE 1994]**

(a) M.D. $= \frac{\Sigma d}{\Sigma f}$ (b) M.D. $= \frac{\Sigma fd}{\Sigma f}$ (c) M.D. $= \frac{\Sigma f|\,d|}{\Sigma f}$ (d) M.D. $= \frac{\Sigma f}{\Sigma f|\,d|}$

62. Let s be the standard deviation of n observations. Each of the n observations is multiplied by a constant c. Then the standard deviation of the resulting numbers is

(a) s (b) cs (c) $s\sqrt{c}$ (d) None of these

63. The S.D. of the first n natural numbers is

(a) $\frac{n+1}{2}$ (b) $\sqrt{\frac{n(n+1)}{2}}$ (c) $\sqrt{\frac{n^2-1}{12}}$ (d) None of these

64. Quartile deviation for a frequency distribution **[DCE 1998]**

(a) $Q = Q_3 - Q_1$ (b) $Q = \frac{1}{2}(Q_3 - Q_1)$ (c) $Q = \frac{1}{3}(Q_3 - Q_1)$ (d) $Q = \frac{1}{4}(Q_2 - Q_1)$

65. The variance of the first n natural numbers is **[AMU 1994; SCRA 2001]**

(a) $\frac{n^2-1}{12}$ (b) $\frac{n^2-1}{6}$ (c) $\frac{n^2+1}{6}$ (d) $\frac{n^2+1}{12}$

66. For a moderately skewed distribution, quartile deviation and the standard deviation are related by **[AMU 1996]**

(a) S.D. $= \frac{2}{3}$ Q.D. (b) S.D. $= \frac{3}{2}$ Q.D. (c) S.D. $= \frac{3}{4}$ Q.D. (d) S.D. $= \frac{4}{3}$ Q.D.

67. For a frequency distribution standard deviation is computed by applying the formula **[Kurukshetra CEE 1999]**

(a) $\sigma = \sqrt{\left(\frac{\Sigma fd}{\Sigma f}\right) - \frac{\Sigma fd^2}{\Sigma f}}$ (b) $\sigma = \sqrt{\frac{\Sigma fd^2}{\Sigma f} - \left(\frac{\Sigma fd^2}{\Sigma f}\right)^2}$ (c) $\sigma = \sqrt{\left(\frac{\Sigma fd}{\Sigma f}\right)^2 - \frac{\Sigma fd^2}{\Sigma f}}$ (d) $\sigma = \sqrt{\frac{\Sigma fd^2}{\Sigma f} - \left(\frac{\Sigma fd}{\Sigma f}\right)^2}$

68. For a frequency distribution standard deviation is computed by

(a) $\sigma = \frac{\Sigma f(x - \bar{x})}{\Sigma f}$ (b) $\sigma = \frac{\sqrt{\Sigma f(x - \bar{x})^2}}{\Sigma f}$ (c) $\sigma = \sqrt{\frac{\Sigma f(x - \bar{x})^2}{\Sigma f}}$ (d) $\sigma = \sqrt{\frac{\Sigma f(x - \bar{x})}{\Sigma f}}$

69. If Q.D is 16, the most likely value of S.D. will be

(a) 24 (b) 42 (c) 10 (d) None of these

70. If M.D. is 12, the value of S.D. will be

(a) 15 (b) 12 (c) 24 (d) None of these

71. The range of following set of observations 2, 3, 5, 9, 8, 7, 6, 5, 7, 4, 3 is

(a) 11 (b) 7 (c) 5.5 (d) 6

72. If v is the variance and σ is the standard deviation, then **[Kurukshetra CEE 1995]**

(a) $v^2 = \sigma$ (b) $v = \sigma^2$ (c) $v = \frac{1}{\sigma}$ (d) $v = \frac{1}{\sigma^2}$

73. If each observation of a raw data whose variance is σ^2, is increased by λ, then the variance of the new set is

(a) σ^2 (b) $\lambda^2\sigma^2$ (c) $\lambda + \sigma^2$ (d) $\lambda^2 + \sigma^2$

74. If each observation of a raw data whose variance is σ^2, is multiplied by λ, then the variance of the new set is **[Pb. CET**

(a) σ^2 (b) $\lambda^2\sigma^2$ (c) $\lambda + \sigma^2$ (d) $\lambda^2 + \sigma^2$

75. The standard deviation for the set of numbers 1, 4, 5, 7, 8 is 2.45 nearly. If 10 are added to each number, then the new standard deviation will be

(a) 2.45 nearly (b) 24.45 nearly (c) 0.245 nearly (d) 12.45 nearly

76. For a given distribution of marks mean is 35.16 and its standard deviation is 19.76. The co-efficient of variation is

(a) $\frac{35.16}{19.76}$ (b) $\frac{19.76}{35.16}$ (c) $\frac{35.16}{19.76} \times 100$ (d) $\frac{19.76}{35.16} \times 100$

77. If 25% of the item are less than 20 and 25% are more than 40, the quartile deviation is

(a) 20 (b) 30 (c) 40 (d) 10

78. For a normal curve, the greatest ordinate is

(a) $2\pi\sigma$ (b) $\sigma\sqrt{2\pi}$ (c) $\frac{1}{\sqrt{2\pi\sigma}}$ (d) $\frac{1}{\sigma\sqrt{2\pi}}$

79. If the variance of observations $x_1, x_2, \ldots\ldots x_n$ is σ^2, then the variance of $ax_1, ax_2 \ldots\ldots, ax_n$, $\alpha \neq 0$ is

(a) σ^2 (b) $a\sigma^2$ (c) $a^2\sigma^2$ (d) $\frac{\sigma^2}{a^2}$

80. The mean deviation from the mean for the set of observations –1, 0, 4 is

(a) $\sqrt{\frac{14}{3}}$ (b) 2 (c) $\frac{2}{3}$ (d) None of these

81. The mean and S.D. of 1, 2, 3, 4, 5, 6 is

(a) $\frac{7}{2}, \sqrt{\frac{35}{12}}$ (b) 3, 3 (c) $\frac{7}{2}, \sqrt{3}$ (d) $3, \frac{35}{12}$

82. The standard deviation of 25 numbers is 40. If each of the numbers is increased by 5, then the new standard deviation will be **[DCE 1995]**

(a) 40 (b) 45 (c) $40+\frac{21}{25}$ (d) None of these

83. The S.D of 15 items is 6 and if each item is decreased by 1, then standard deviation will be **[Pb. CET 1998]**

(a) 5 (b) 7 (c) $\frac{91}{15}$ (d) 6

84. The quartile deviation for the data

x :	2	3	4	5	6
f :	3	4	8	4	1

is **[AMU 1988; Kurukshetra CEE 1999]**

(a) 0 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 1

85. The sum of squares of deviations for 10 observations taken from mean 50 is 250. The co-efficient of variation is **[DCE 1**

(a) 50% (b) 10% (c) 40% (d) None of these

86. One set containing five numbers has mean 8 and variance 18 and the second set containing 3 numbers has mean 8 and variance 24. Then the variance of the combined set of numbers is

(a) 42 (b) 20.25 (c) 18 (d) None of these

87. The means of five observations is 4 and their variance is 5.2. If three of these observations are 1, 2 and 6, then the other two are **[AMU 1994]**

(a) 2 and 9 (b) 3 and 8 (c) 4 and 7 (d) 5 and 6

88. The mean of 5 observations is 4.4 and their variance is 8.24. If three observations are 1, 2 and 6, the other two observations are **[AMU 1998]**

(a) 4 and 8 (b) 4 and 9 (c) 5 and 7 (d) 5 and 9

89. Consider any set of observations $x_1, x_2, .x_3, ..., x_{101}$; it being given that $x_1 < x_2 < x_3 < .... < x_{100} < x_{101}$; then the mean deviation of this set of observations about a point k is minimum when k equals **[DCE 1997]**

(a) x_1 (b) x_{51} (c) $\frac{x_1+x_2+...+x_{101}}{101}$ (d) x_{50}

90. The mean and S.D of the marks of 200 candidates were found to be 40 and 15 respectively. Later, it was discovered that a score of 40 was wrongly read as 50. The correct mean and S.D respectively are

(a) 14.98, 39.95 (b) 39.95, 14.98 (c) 39.95, 224.5 (d) None of these

91. Let r be the range and $S^2=\frac{1}{n-1}\sum_{i=1}^{n}(x_i-\bar{x})^2$ be the S.D. of a set of observations $x_1, x_2, ... x_n$, then

(a) $S \le r\sqrt{\frac{n}{n-1}}$ (b) $S = r\sqrt{\frac{n}{n-1}}$

(c) $S \ge r\sqrt{\frac{n}{n-1}}$ (d) None of these

92. In any discrete series (when all values are not same) the relationship between M.D. about mean and S.D. is

(a) M.D. = S.D. (b) M.D. ≥ S.D. (c) M.D. < S.D. (d) M.D. ≤ S.D.

93. For $(2n+1)$ observations $x_1, -x_1, x_2, -x_2, ... x_n, -x_n$ and 0 where x's are all distinct. Let S.D. and M.D. denote the standard deviation and median respectively. Then which of the following is always true **[Orissa JEE 2002]**

(a) S.D. < M.D.

(b) S.D. > M.D.

(c) S.D. = M.D.

(d) Nothing can be said in general about the relationship of S.D. and M.D.

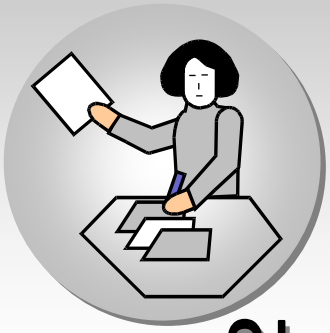
94. Suppose values taken by a variable X are such that $a \le x_i \le b$ where x_i denotes the value of X in the i^{th} case for i = 1, 2, ... n. Then **[Kurukshetra CEE 1995, 2000]**

(a) $a \le \text{Var}(X) \le b$ (b) $a^2 \le \text{Var}(X) \le b^2$ (c) $\frac{a^2}{4} \le \text{Var}(X)$ (d) $(b-a)^2 \ge \text{Var}(X)$

95. The variance of α, β and γ is 9, then variance of 5α, 5β and 5γ is **[AMU 1998]**

(a) 45 (b) $\frac{9}{5}$ (c) $\frac{5}{9}$ (d) 225

* * *



Answer Sheet

Measures of Central Tendency ***Assignment (Basic and Advance Level)***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
c	c	a	a	b	c	a	d	d	c	d	c	d	d	b	d	d	b	a	b
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
c	b	d	c	c	d	d	a	a	d	b	c	d	a	a	c	a	c	c	c
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
c	c	b	a	d	a	c	c	c	b	b	c	b	d	b	c	c	b	a	d
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
c	b	c	b	a	b	d	c	a	a	b	b	b	b	a	d	d	d	c	b
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**					
a	a	d	d	b	b	c	b	b	b	a	b	b	d	d					

Assignment

Correlation

Basic Level

1. For the bivariate frequency table for x and y

y \ x	0 – 10	10 – 20	20 – 30	30 – 40	Sum
0 – 10	3	2	4	2	11
10 – 20	–	1	3	1	5
20 – 30	3	2	–	–	5
30 – 40	–	6	7	–	13
Sum	6	11	14	3	34

Then the marginal frequency distribution for y is given by

(a)

0 – 10	6
10 – 20	11
20 – 30	14
30 – 40	3

(b)

0 – 10	11
10 – 20	5
20 – 30	5
30 – 40	13

(c)

0 – 10	10
10 – 20	12
20 – 30	11

30 – 40	1

(d) None of these

2. The variables x and y represent height in cm and weight in gm respectively. The correlation between x and y has the unit

[MP PET 2003]

(a) gm (b) cm (c) $gm.cm$ (d) None of these

3. The value of $\sum[(x-\bar{x})(y-\bar{y})]$ is

(a) $n.r_{xy}.\sigma_x\sigma_y$ (b) $r_{xy}.\sigma_x^2\sigma_y^2$ (c) $r_{xy}\sqrt{\sigma_x\sigma_y}$ (d) None of these

4. Karl Pearson's coefficient of correlation is dependent **[MP PET 1993]**

(a) Only on the change of origin and not on the change of scale (b) Only on the change of scale and not on the change of origin

(b) On both the change of origin and the change of scale (d) Neither on the change of scale nor on the change of origin

5. If X and Y are independent variable, then correlation coefficient is

(a) 1 (b) – 1 (c) $\frac{1}{2}$ (d) 0

6. The value of the correlation coefficient between two variable lies between **[Kurukshetra CEE 1998]**

(a) 0 and 1 (b) – 1 and 1 (c) 0 and ∞ (d) $-\infty$ and 0

7. The coefficient of correlation between two variables x and y is given by

(a) $r=\frac{\sigma_x^2+\sigma_y^2+\sigma_{x-y}^2}{2\sigma_x\sigma_y}$ (b) $r=\frac{\sigma_x^2+\sigma_y^2-\sigma_{x-y}^2}{2\sigma_x\sigma_y}$ (c) $r=\frac{\sigma_x^2+\sigma_y^2+\sigma_{x-y}^2}{\sigma_x\sigma_y}$ (d) $r=\frac{\sigma_x^2+\sigma_y^2-\sigma_{x-y}^2}{\sigma_x\sigma_y}$

8. If r is the correlation coefficient between two variables, then **[MP PET 1995; Pb. CET 1995]**

(a) $r\geq 1$ (b) $r\leq 1$ (c) $|r|\leq 1$ (d) $|r|\geq 1$

9. When the correlation between two variables is perfect, then the value of coefficient of correlation r is

(a) –1 (b) +1 (c) 0 (d) ± 1

10. If correlation between x and y is r, then between y and x correlation will be

(a) $-r$ (b) $\frac{1}{r}$ (c) r (d) 1- r

11. If r is the coefficient of correlation and $Y=a+bX$, then $|r|=$

(a) $\frac{a}{b}$ (b) $\frac{b}{a}$ (c) 1 (d) None of these

12. If coefficient of correlation between the variables x and y is zero, then

(a) Variables x and y have no relation (b) y decreases as x increases

(c) y increases as x increases (d) There may be a relation between x and y

13. When the origin is changed, then the coefficient of correlation

(a) Becomes zero (b) Varies (c) Remains fixed (d) None of these

14. If $r=-0.97$, then

(a) Correlation is negative and curved (b) Correlation is linear and negative

(c) Correlation is in third and fourth quadrant (d) None of these

15. In a scatter diagram, if plotted points form a straight line running from the lower left to the upper right corner, then there exists a

(a) High degree of positive correlation (b) Perfect positive correlation

(c) Perfect negative correlation (d) None of these

16. If the two variables x and y of a bivariate distribution have a perfect correlation, they may be connected by **[Kurukshet**

(a) $xy = 1$ (b) $\frac{a}{x} + \frac{b}{y} = 1$ (c) $\frac{x}{a} + \frac{y}{b} = 1$ (d) None of these

17. If x and y are related as $y - 4x = 3$, then the nature of correlation between x and y is

(a) Perfect positive (b) Perfect negative (c) No correlation (d) None of these

18. If $\sum x = 15$, $\sum y = 36$, $\sum xy = 110$, $n = 5$ then $Cov(x, y)$ equals **[AI CBSE 1991]**

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

19. For a bivariable distribution (x, y), if $\sum xy = 350, \sum x = 50, \sum y = 60, \bar{x} = 5, \bar{y} = 6$, then $Cov(x, y)$ equals **[Pb. CET 1997, AMU 1992]**

(a) 5 (b) 6 (c) 22 (d) 28

20. For covariance the number of variate values in the two given distribution should be **[AMU 1989]**

(a) Unequal (b) Any number in one and any number in the other

(c) Equal (d) None of these

21. If x and y are independent variables, then **[AMU 1994]**

(a) $Cov(x, y) = 1$ (b) $Cov(x, y) = -1$ (c) $Cov(x, y) = 0$ (d) $Cov(x, y) = \pm\frac{1}{2}$

22. If

x :	3	4	8	6	2	1
y :	5	3	9	6	9	2

then the coefficient of correlation will be approximately **[AI CBSE 1990]**

(a) 0.49 (b) 0. 40 (c) – 0. 49 (d) – 0. 40

23. The coefficient of correlation for the following data

x	20	25	30	35	40	45
y	16	10	8	20	5	10

will be **[AI CBSE 1988]**

(a) 0. 32 (b) – 0.32 (c) 0. 35 (d) None of these

24. Coefficient of correlation from the following data

x :	1	2	3	4	5
y :	2	5	7	8	10

will be **[DSSE 1983, AI CBSE 1991]**

(a) 0. 97 (b) – 0.97 (c) 0. 90 (d) None of these

25. Coefficient of correlation between x and y for the following data

x :	15	16	17	17	18	20	10

y	12	17	15	16	12	15	11
:							

will be approximately **[DSSE 1979, 81; AI CBSE 1990]**

(a) 0. 50 (b) 0. 53 (c) – 0. 50 (d) – 0. 53

26. Karl Pearson's coefficient of correlation between x and y for the following data **[AISSE 1983, 85, 90]**

x :	3	4	8	9	6	2	1
y	5	3	7	7	6	9	2
:							

(a) 0. 480 (b) – 0. 480 (c) 0. 408 (d) – 0. 408

27. The coefficient of correlation for the following data

x :	1	2	3	4	5	6	7	8	9	10
y :	3	10	5	1	2	9	4	8	7	6

will be **[AISSE 1986, 1990]**

(a) 0. 224 (b) 0. 240 (c) 0. 30 (d) None of these

28. Karl Pearson's coefficient of correlation between the marks in English and Mathematics by ten students

Marks in English	20	13	18	21	11	12	17	14	19	15
Marks in Maths	17	12	23	25	14	8	19	21	22	19

will be **[AISSE 1979, 82]**

(a) 0. 75 (b) – 0. 75 (c) 0. 57 (d) None of these

29. Coefficient of correlation between x and y for the following data

x	–4	–3	–2	–1	0	1	2	3	4
y	16	9	4	1	0	1	4	9	16

will be **[Mathematics Olympiad 1981; DSSE 1980]**

(a) 1 (b) –1 (c) 0 (d) None of these

30. If the variances of two variables x and y are respectively 9 and 16 and their covariance is 8, then their coefficient of correlation is **[MP PET 1998]**

(a) $\frac{2}{3}$ (b) $\frac{8}{3\sqrt{2}}$ (c) $\frac{9}{8\sqrt{2}}$ (d) $\frac{2}{9}$

31. If the co-efficient of correlation between x and y is 0. 28, covariance between x and y is 7.6 and the variance of x is 9, then the S.D. of y series is

(a) 9.8 (b) 10. 1 (c) 9.05 (d) 10. 05

32. If $Cov(x, y) = 0$, then $\rho(x,y)$ equals **[AMU 1993]**

(a) 0 (b) 1 (c) – 1 (d) $\pm\frac{1}{2}$

33. Karl Pearson's coefficient of correlation between the heights (in inches) of teachers and students corresponding to the given data

Height of teachers x :	6 6	67	6 8	6 9	70
Height of students y :	6 8	6	6 9	72	70

is **[MP PET 1993]**

(a) $\frac{1}{\sqrt{2}}$ (b) $\sqrt{2}$ (c) $-\frac{1}{\sqrt{2}}$ (d) 0

34. The coefficient of correlation between x and y is 0.6, then covariance is 16. Standard deviation of x is 4, then the standard deviation of y is

(a) 5 (b) 10 (c) 20/3 (d) None of these

35. If $Cov(u,v) = 3,\ \sigma_u^2 = 4.5, \sigma_v^2 = 5.5$, then $\rho(u,v)$ is **[AMU 1988]**

(a) 0.121 (b) 0.603 (c) 0.07 (d) 0.347

36. Given $n = 10,\ \sum x = 4,\ \sum y = 3,\ \sum x^2 = 8,\ \sum y^2 = 9$ and $\sum xy = 3$, then the coefficient of correlation is **[Pb. CET 1999]**

(a) $\frac{1}{4}$ (b) $\frac{7}{12}$ (c) $\frac{15}{4}$ (d) $\frac{14}{3}$

37. Let r_{xy} be the coefficient of correlation between two variables x and y. If the variable x is multiplied by 3 and the variable y is increased by 2, then the correlation coefficient of the new set of variables is

(a) r_{xy} (b) $3r_{xy}$ (c) $3r_{xy} + 2$ (d) None of these

38. Coefficient of correlation between the two variates X and Y is

X	1	2	3	4	5
Y	5	4	3	2	1

(a) 0 (b) –1 (c) 1 (d) None of these

39. The coefficient of correlation between two variables X and Y is 0.5, their covariance is 15 and $\sigma_x = 6$, then $\sigma_y =$ **[AMU 1998]**

(a) 5 (b) 10 (c) 20 (d) 6

40. Karl Pearson's coefficient of rank correlation between the ranks obtained by ten students in Mathematics and Chemistry in a class test as given below

Rank in Mathematics :	1	2	3	4	5	6	7	8	9	10
Rank in Chemistry :	3	10	5	1	2	9	4	8	7	6

is **[AISSE 1990]**

(a) 0.224 (b) 0.204 (c) 0.240 (d) None of these

41. The sum of squares of differences in ranks of marks obtained in Physics and Chemistry by 10 students in a test is 150, then the co-efficient of rank-correlation is given by

(a) 0.909 (b) 0.091 (c) 0.849 (d) None of these

Advance Level

42. If a, b, h, k are constants, while U and V are $U = \frac{X-a}{h},\ V = \frac{Y-b}{k}$, then **[DCE 1999]**

(a) $Cov(X, Y) = Cov(U, V)$ (b) $Cov(X, Y) = hk\ Cov(U, V)$

(c) $Cov(X, Y) = ab\ Cov(U, V)$ (d) $Cov(U, V) = hk\ Cov(X, Y)$

43. Let X, Y be two variables with correlation coefficient $\rho(X, Y)$ and variables U, V be related to X, Y by the relation $U = 2X$, $V = 3Y$, then $\rho(U, V)$ is equal to **[AMU 1999]**

(a) $\rho(X, Y)$ (b) $6\rho(X, Y)$ (c) $\sqrt{6}\rho(X, Y)$ (d) $\frac{3}{2}\rho(X, Y)$

44. If X and Y are two uncorrelated variables and if $u = X + Y$, $v = X - Y$, then $r(u, v)$ is equal to **[DCE 1998]**

(a) $\frac{\sigma_x^2 + \sigma_y^2}{\sigma_x^2 - \sigma_y^2}$ (b) $\frac{\sigma_x^2 - \sigma_y^2}{\sigma_x^2 + \sigma_y^2}$ (c) $\frac{\sigma_x^2 + \sigma_y^2}{\sigma_x \sigma_y}$ (d) None of these

45. If $\bar{x} = \bar{y} = 0, \sum x_i y_i = 12, \sigma_x = 2, \sigma_y = 3$ and $n = 10$, then the coefficient of correlation is **[MP PET 1999]**

(a) 0.4 (b) 0.3 (c) 0.2 (d) 0.1

46. Let X and Y be two variables with the same variance and U and V be two variables such that $U = X + Y$, $V = X - Y$. Then $Cov(U, V)$ is equal to

(a) $Cov(X, Y)$ (b) 0 (c) 1 (d) – 1

Regression

Basic Level

47. If there exists a linear statistical relationship between two variables x and y, then the regression coefficient of y on x is **[MP PET 1998]**

(a) $\frac{cor(x,y)}{\sigma_x . \sigma_y}$

(b) $\frac{cor(x,y)}{\sigma_y^2}$

(c) $\frac{cor(x,y)}{\sigma_x^2}$

(d) $\frac{cor(x,y)}{\sigma_x}$, where σ_x, σ_y are standard deviations of x and y respectively.

48. If $ax + by + c = 0$ is a line of regression of y on x and $a_1 x + b_1 y + c_1 = 0$ that of x on y, then

(a) $a_1 b \le a b_1$ (b) $aa_1 = bb_1$ (c) $ab_1 \le a_1 b$ (d) None of these

49. Least square lines of regression give best possible estimates, when $\rho(X, Y)$ is **[DCE 1996]**

(a) <1 (b) > –1 (c) –1 or 1 (d) None of these

50. Which of the following statement is correct **[Kurukshetra CEE 1995]**

(a) Correlation coefficient is the arithmetic mean of the regression coefficient

(b) Correlation coefficient is the geometric mean of the regression coefficient

(c) Correlation coefficient is the harmonic mean of the regression coefficient

(d) None of these

51. The relationship between the correlation coefficient r and the regression coefficients b_{xy} and b_{yx} is **[MP PET 2003; Pb. C**

(a) $r = \frac{1}{2}(b_{xy} + b_{yx})$ (b) $r = \sqrt{b_{xy} . b_{yx}}$ (c) $r = (b_{xy} b_{yx})^2$ (d) $r = b_{xy} + b_{yx}$

52. If the coefficient of correlation is positive, then the regression coefficients **[Pb. CET 1998; PU CET 2002]**

(a) Both are positive

(b) Both are negative

(c) One is positive and another is negative

(d) None of these

53. If b_{yx} and b_{xy} are both positive (where b_{yx} and b_{xy} are regression coefficients), then **[MP PET 2001]**

(a) $\frac{1}{b_{yx}}+\frac{1}{b_{xy}}<\frac{2}{r}$ (b) $\frac{1}{b_{yx}}+\frac{1}{b_{xy}}>\frac{2}{r}$

(c) $\frac{1}{b_{yx}}+\frac{1}{b_{xy}}<\frac{r}{2}$ (d) None of these

54. If x_1 and x_2 are regression coefficients and r is the coefficient of correlation, then

(a) $x_1-x_2>r$ (b) $x_1+x_2<r$ (c) $x_1+x_2\geq 2r$ (d) None of these

55. If one regression coefficient be unity, then the other will be

(a) Greater than unity (b) Greater than or equal to unity (c) Less than or equal to unity (d)

56. If one regression coefficient be less than unity, then the other will be

(a) Less than unity (b) Equal to unity (c) Greater than unity (d) All of the above

57. If regression coefficient of y on x is 2, then the regression coefficient of x on y is **[AMU 1990]**

(a) 2 (b) $\frac{1}{2}$ (c) $\leq\frac{1}{2}$ (d) None of these

58. The lines of regression of x on y estimates **[AMU 1993]**

(a) x for a given value of y (b) y for a given value of x (c) x from y and y from x(d)

59. The statistical method which helps us to estimate or predict the unknown value of one variable from the known value of the related variable is called **[Pb. CET 1995]**

(a) Correlation (b) Scatter diagram (c) Regression (d) Dispersion

60. The coefficient of correlation between two variables x and y is 0.8 while regression coefficient of y on x is 0.2. Then the regression coefficient of x on y is **[MP PET 1993]**

(a) –3.2 (b) 3.2 (c) 4 (d) 0.16

61. If the lines of regression coincide, then the value of correlation coefficient is

(a) 0 (b) 1 (c) 0.5 (d) 0.33

62. Two lines of regression are $3x+4y-7=0$ and $4x+y-5=0$. Then correlation coefficient between x and y is **[AI CBSE 199**

(a) $\frac{\sqrt{3}}{4}$ (b) $-\frac{\sqrt{3}}{4}$ (c) $\frac{3}{16}$ (d) $-\frac{3}{16}$

63. If the two lines of regression are $4x+3y+7=0$ and $3x+4y+8=0$, then the means of x and y are **[AI CBSE 1990]**

(a) $-\frac{4}{7},-\frac{11}{7}$ (b) $-\frac{4}{7},\frac{11}{7}$ (c) $\frac{4}{7},-\frac{11}{7}$ (d) 4, 7

64. The two regression lines for a bivariate data are $x+y+50=0$ and $2x+3y+K=0$. If $\bar{x}=0$, then $\bar{y}$ is **[BCA Delhi Entrance Exam. 1999]**

(a) 50 (b) $K-100$ (c) – 50 (d) $50+K$

65. The two regression lines are $2x-9y+6=0$ and $x-2y+1=0$. What is the correlation coefficient between x and y **[DCE 1999]**

(a) $-\frac{2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{4}{9}$ (d) None of these

66. If the two regression coefficient between x and y are 0.8 and 0.2, then the coefficient of correlation between them is **[MP PET 2000]**

(a) 0.4 (b) 0.6 (c) 0.3 (d) 0.5

67. The two lines of regression are given by $3x + 2y = 26$ and $6x + y = 31$. The coefficient of correlation between x and y is **[DCE 2000]**

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

68. If the lines of regression be $x - y = 0$ and $4x - y - 3 = 0$ and $\sigma_x^2 = 1$, then the coefficient of correlation is

(a) – 0.5 (b) 0.5 (c) 1.0 (d) – 1.0

69. A student obtained two regression lines as $L_1 \equiv x - 5y + 7 = 0$ and $L_2 \equiv 3x + y - 8 = 0$. Then the regression line of y on x is

(a) L_1 (b) L_2 (c) Neither of the two (d) $x - 5y = 0$

70. If b_{yx} and b_{xy} are regression coefficients of y on x and x on y respectively, then which of the following statement is true **[Pb. CET 1996]**

(a) $b_{xy} = 1.5, b_{yx} = 1.4$ (b) $b_{xy} = 1.5, b_{yx} = 0.9$ (c) $b_{xy} = 1.5, b_{yx} = 0.8$ (d) $b_{xy} = 1.5, b_{yx} = 0.6$

71. Angle between two lines of regression is given by **[Kurukshetra CEE 2000; DCE 1998]**

(a) $\tan^{-1}\left(\frac{b_{yx} - \frac{1}{b_{xy}}}{1 + \frac{b_{xy}}{b_{yx}}}\right)$ (b) $\tan^{-1}\left(\frac{b_{yx} - b_{xy} - 1}{b_{yx} + b_{xy}}\right)$ (c) $\tan^{-1}\left(\frac{b_{xy} - \frac{1}{b_{yx}}}{1 + \frac{b_{xy}}{b_{yx}}}\right)$ (d) $\tan^{-1}\left(\frac{b_{yx} - b_{xy}}{1 + b_{yx}.b_{xy}}\right)$

72. If acute angle between the two regression lines is θ, then

(a) $\sin\theta \geq 1 - r^2$ (b) $\tan\theta \geq 1 - r^2$ (c) $\sin\theta \leq 1 - r^2$ (d) $\tan\theta \leq 1 - r^2$

73. If the angle between the two lines of regression is 90°, then it represents **[DCE 1999]**

(a) Perfect correlation (b) Perfect negative correlation (c) No linear correlation (d)

74. If $2x + y = 7$ and $x + 2y = 7$ are the two regression lines respectively, then the correlation co-efficient between x and y is **[DCE 1983; AMU 1993]**

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

75. For a perfect correlation between the variables x and y, the line of regression is $ax + by + c = 0$ where $a, b, c > 0$; then $\rho(x, y) =$ **[AMU 1999]**

(a) 0 (b) –1 (c) 1 (d) None of these

76. If two random variables X and Y of a bivariate distribution are connected by the relationship $3x + 2y = 4$, then correlation coefficient r_{xy} equals **[AMU 1999]**

(a) 1 (b) –1 (c) 2/3 (d) –2/3

77. Two variables x and y are related by the linear equation $ax + by + c = 0$. The coefficient of correlation between the two is +1, if **[DCE 2002]**

(a) a is positive (b) b is positive (c) a and b both are positive (d) a and b are of opposite sig

78. If the two lines of regression are $5x+3y=55$ and $7x+y=45$, then the correlation coefficient between x and y is **[AMU 1**

(a) +1 (b) –1 (c) $-\sqrt{\frac{5}{21}}$ (d) $-\sqrt{\frac{21}{5}}$

79. The error of prediction of x from the required line of regression is given by,

(where ρ is the co-efficient of correlation) **[AMU 1992]**

(a) $\sigma_x(1-\rho^2)$ (b) $n\sigma_x^2(1-\rho^2)$ (c) $\sigma_x^2(1-\rho^2)$ (d) $n\sigma_y^2(1-\rho^2)$

80. Probable error of r is

(a) $0.6745\left(\frac{1-r^2}{\sqrt{n}}\right)$ (b) $0.6754\left(\frac{1+r^2}{\sqrt{n}}\right)$ (c) $0.6547\left(\frac{1-r^2}{n}\right)$ (d) $0.6754\left(\frac{1-r^2}{n}\right)$

Advance Level

81. For the following data

	x	y
Mean	65	67
Standard deviation	5.0	2.5
Correlation coefficient	0.8	

Then the equation of line of regression of y on x is

(a) $y-67=\frac{2}{5}(x-65)$ (b) $y-67=\frac{1}{5}(x-65)$ (c) $x-65=\frac{2}{5}(y-67)$ (d) $x-65=\frac{1}{5}(y-67)$

82. If the lines of regression of y on x and that of x on y are $y=kx+4$ and $x=4y+5$ respectively, then

(a) $k\le 0$ (b) $k\ge 0$ (c) $0\le k\le\frac{1}{4}$ (d) $0\le k\le 1$

83. From the following observations $\{(x,y)\}=\{(1,7),(4,5),(7,2),(10,6),(13,5)\}$. The line of regression of y on x is **[AI CBSE 1991]**

(a) $7x+30y-187=0$ (b) $7x-30y-187=0$ (c) $7x-30y+187=0$ (d) None of these

84. If the variance of $x=9$ and regression equations are $4x-5y+33=0$ and $20x-9y-10=0$, then the coefficient of correlation between x and y and the variance of y respectively are **[AMU1997, 2002]**

(a) 0.6; 16 (b) 0.16; 16 (c) 0.3; 4 (d) 0.6; 4

85. If the two lines of regression are $x+4y=3$ and $3x+y=15$, then value of x for $y=3$ is **[DCE 1998]**

(a) 4 (b) –9 (c) – 4 (d) None of these

86. Which of the following two sets of regression lines are the true representative of the information from the bivariate population

I. $x+4y=15$ and $y+3x=12, \bar{x}=3, \bar{y}=3$ II. $3x+4y=9$ and $4x+y=1, \bar{x}=-\frac{5}{10}, \bar{y}=\frac{30}{13}$ **[AMU 2000]**

(a) Both I and II (b) II only (c) I only (d) None of these

87. Out of the two lines of regression given by $x+2y=4$ and $2x+3y-5=0$, the regression line of x on y is **[Kurukshetra CE**

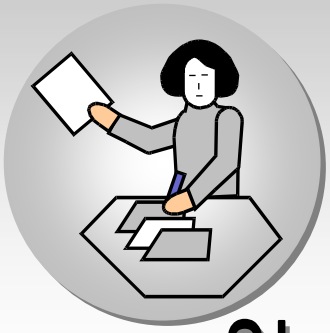
(a) $x+2y=4$ (b) $2x+3y-5=0$

(c) The given lines cannot be the regression lines (d) $x+2y=0$

88. Regression of savings (S) of a family on income Y may be expressed as $S = a + \frac{Y}{m}$, where a and m are constants. In a random sample of 100 families the variance of savings is one-quarter of the variance of incomes and the correlation coefficient is found to be 0.4. The value of m is

(a) 2 (b) 5 (c) 8 (d) None of these

* * *



Answer Sheet

Correlation and Regression ***Assignment (Basic and Advance Level)***

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
b	d	a	d	d	b	b	c	d	c	c	a	c	b	b	c	a	c	a	c
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
c	a	b	a	b	c	a	a	c	a	c	a	a	c	b	b	a	b	a	a
41	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**
b	b	a	b	c	b	c	c	c	b	b	a	b	c	c	d	c	a	c	b
61	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
b	b	a	c	b	a	c	b	c	d	c	c	c	d	b	b	d	c	b	a
81	**82**	**83**	**84**	**85**	**86**	**87**	**88**												
a	c	d	a	a	c	b	b												