## MATH ASSIGNMENT NO. 11

**Maximum Marks: - 100**                                                      **Time: 2 Hours**

1. Find issue price of 12% Bond of ₹ 1000, redeemed after 9 years at 8% premium if market Rate is 15% p.a.
2. A loan of ₹ 40 lakh payable in 6 years @ 9% on EMI basis was rescheduled after 15 months and was converted to 20 EQ1. Find Amount payable quarterly
3. If difference in Simple interest & compound interest for 5 years @ 10% if compounded quarterly is ₹ 2,76,000 find Amount invested.
4. In a normally distribution labour intensive units with 30,000 workers 5% draw more than 50,000 and 15% draw less than 15,000 find C/V
5. In a Poisson distribution $3P(x = 4) = 6P(x = 5)$ find 3rd moment
6. In a symmetrical Binomial Distribution with 324 trials, the 4th moment's
7. If the value of money is reduced to 41% find D/A to be given
8. If CBI is increased from 270 to 980 & wages is increased from Rs13,000 to Rs41000. Find whether any D/A is required to be paid.
9. White computing co-efficient of co relation of 16 items the PE is computed as 0.016, find co-efficient of alienation
10. If $r_{xy}$ = .70 and x & u are related to $3x + 4u - 7 = 0$ and y & v are related to $4y - 6v + 9 = 0$ the $r_{uv}$=?
11. A person has 5 children but he can take only 2 along with him in movies. In how many ways he can manage, if the same children can't always be taken.
12. If α and β are the roots of equation $3x^2 + 9x + 15 = 0$ find the value of $α^2 - β^2$=?
13. Solve for x if $\left|\frac{3x-9}{4}\right| \leq 9$
14. If $a^2$ $b^2$ and $c^2$ are in AP find the value of $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b}$=?
15. If the word G O U R M E T is written in different ways find Probability no 2 vowels are together
16. If the word "F A S T I D I O U S" is written in different ways find probability vowels & consonants are written alternatively.
17. $f(x) = x^3$ {x → n. n< 5} find the function
18. $\int \frac{e^x(x+4)}{(x+5)^2} dx$
19. $\int_0^9 \frac{\sqrt{9-x}}{\sqrt{x}+\sqrt{9-x}} dx$

20. The cost function of a company is given by:

   $C(x) = 100x - 8x^2 + \frac{x^3}{3}$, the output at which marginal cost is minimum

21. In a Group of 400 persons 20% are smokers. 40% of them are vegetarian. If 60% of non. Veg are smokers find Probability a person selected is vegetarian provided he is smoker

22. Bag I $\begin{bmatrix} \overline{\text{Red} \ \text{Blue}} \\ 4 \quad 6 \end{bmatrix}$

   Bag II     [ 3     7 ]

   Bag III    [ 5     5 ]

   A ball is selected and found Blue find P it is selected from beg II

23. 
| Class | Frequency |
|-------|-----------|
| 0-10  | 9 |
| 10-20 | 11 |
| 20-30 | 13 |
| 30-40 | 17 |
| 40-50 | 16 |
| 50-60 | 14 |
| 60-70 | 12 |
| 70-80 | 13 |
| 80-90 | 8 |

   Compute co-efficient of $MD_{\bar{x}}$

24. 
| Base Year | | Current Year | |
|-----------|-----|-----|-----|
| $P_0$ | $Q_0$ | $P_1$ | $Q_1$ |
| 10 | 40 | 20 | 60 |
| 15 | 50 | 30 | 80 |
| 20 | 60 | 50 | 90 |
| 30 | 70 | 70 | 90 |

   Find Price index by fisher's method

25. 
| Year: | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------|------|------|------|------|------|------|------|------|------|------|
| FBI: | 100 | 140 | 190 | 250 | 320 | 400 | 500 | 660 | 800 | 1000 |

   In which year inflation is highest

26. 
| Year: | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------|------|------|------|------|------|------|------|------|------|------|
| FBI: | 100 | 130 | 170 | 210 | 240 | 350 | 430 | 510 | 590 | 700 |

   Find in which year inflection is minimum

27. A plant was depreciated @ 15% p.a. if W.D.V is ₹ 11,40,000 & it was purchased 9 years ago what is the cost of plant

28. Find Present value of advance annuity of ₹ 15000 per month @ 9% p a if started from immediate effect.

29. An amount becomes double in 6 years if compounded semi-annually. At what time it will become triple if compounded monthly.

30. If effective rate of interest is 19.75% p.a.on compounded fortnightly, the annual nominal rate of interest will be

31. $b_{xy} = 2.70$

   $b_{yx} = .50$

The co-efficient of alienation will be

32. An amount becomes 1.6 times in 8 years if on Simple interest after how many times it will become 4 times if rate of interest is 1% highest

33. $^{(m+n)}P_4 = 840$ and $^{(m-n)}P_4 = 120$ find m

34. $\dfrac{20^n + 5^n}{20^{n-1} + 5^{n-1}} = 10$ find n

35. In two Arithmetic progression ratio of nth term is $(2x + 7) : (5x - 9)$ the ratio of $S_{140}$ is

36. If ratio of sum of n terms of two APs are $(7x + 5) : (5x + 7)$ find ratio of $100^{th}$ term is

37. Find value $(729), (729)^{\frac{1}{7}}, (729)^{\frac{1}{49}}, (729)^{\frac{1}{729}} \ldots \ldots \ldots \ldots \ldots \ldots \ldots S_\infty$

38. $1 + \dfrac{6}{4} + \dfrac{11}{16} + \dfrac{16}{64} + \dfrac{21}{256} + \ldots \ldots \ldots \ldots \ldots \ldots .. S\infty$

39. An amount becomes 18700 in 2 years if on simple interest & ₹ 21700 in 3 years. Find $r = ?$

40. If α & β are the roots of equation $4x^2 - 16x + 24 = 0$ find the value of $3\alpha^3 + 4\alpha^2 + 5\alpha + 3\beta^3 + 4\beta^2 + 5\beta = ?$

41. If Economic growth in economy is 13% while inflation rate is 10.70% the net increase in Economy after 9 years will be


42. If ALUMINUS is coded as ULAIMSUN
    HUMANITY: MUHINAYTI
    How the ward COURTSEY shall be coded

43. Find the missing value 1, 2, 10, 37, 101, 236…………

44. Find the missing value 1, 14, 39, 84, 155 …………

45. Find the missing value 2, 20, 90, 272 …………

46. Find the missing value 2, 24, 108, 320 …………

47. Find the missing value 0, 15, 80, 255, 624 …………

48. Find the missing value 0, 6, 27, 60, 120 …………

49. $3x + 9y - 15 = 0$ and $4x + 24y + 30 = 0$ are the equations of two regression lines find coefficient of alienation

50. X: 30    30    30    40    50    20    35
    Y: 40    45    50    55    35    25    20
    Find $r_k$

51. Find sum of all 4-digit numbers formed with 0, 4, 5, 7, 9

52. Find sum of all 5 digit numbers formed with 0, 2, 3, 4, 5, 7

53. A 4 digit number is formed with 1, 3, 4, 5, 7, 9 find probability number lies in between 3400 and 5400.

54. In an examination there are 2 parts A and B containing 7 & 9 questions in how many ways at least 2 questions from each part can be solved.

55. An amount becomes triple in 10 years if compounded quarterly. Find rate of interest

56. A, B, C throw a pair of dice till doublet appears if A starts the game find Probability of winning C

57. If $\log_a 4 = \dfrac{7}{2}$ find a

58. If the ward is formed by selecting 4 letters from EXAMINATION how many such words can is formed.

59. If 10 is added to all the observations C/V become 10%. If 10 is deducted from all the observation C/V becomes 36% find C/V if 5 is added to all the observation.

60. $X \sim P$    C/V = 40% find $4^{th}$ moment

61. If the word COMBINATIONS is written in different ways find P. all vowels are written in the starting of wards

62. The cost of producing 400 items is Rs 2300 and cost of producing 900 items is Rs 3800 find cost of producing 1500 items.

63. Cost of producing 900 items is Rs 4600 & cost of Producing 1500 items is Rs7000 compute AC at $x = 600$

64. In a normally distributed factory with 20,000 employees if 15% employees draw less than ₹ 20,000 and SD is computed as 6000 find average salary (z = 1.04 at 35% Probability)

65. If 4$^{th}$ central moment in poison distribution is computed as 243 the C/V is computed as

66. A plant was depreciated @15% for first 4 years @ 20% for next 3 years and @25% for another 3 years. If written down value of the plant after 10 year is ₹ 3,74,000 the cost of plant is

67. X and Y are independent normal variable with mean 100 and 80 and SD are 4 & 3 respectively find probability distribution of (X + Y)

68. P.E is related to r in the following ways
   (a) r > 6$P$ $E$ s
   (b) r < 6$P$ $E$
   (c) PE > 6$r$
   (d) None of these

69. In the normally distributed factory with 30,000 employees if Mean is computed as 40,000 and RD is computed as 27,000 how many workers draw salary less than Rs 13,000

70. If the world PLAGIARISM is written in different ways, the probability the place of vowels and place of consonants will remain the same

71.          Red          Blue
   Bag I      6            7
   Bag II     4            9
   Bag II     8            15
   A pair of dice is thrown if doublet appears ball is drawn for Bag I, if atleast 10 appears the ball is drawn from Bag II, find probability ball is drawn from Bag III and is Red.

72. The value of money is reduced by 29% and D/A is also increased by 30% how much more D/A, is required to be paid

73. While computing Coefficient of Co-relation between the two variables of 10 items the difference of rank in two variables is wrongly taken as 7 instead of 6 if computed co efficient of alienation is 49%, the actual Co-efficient of Co-relation is

74. What is the **Bijective** function?
   (a) One to one onto
   (b) One to one into
   (c) Many to one onto
   (d) None of these

75. Surjective function is
   (a) One to one into
   (b) Many to one into
   (c) Any onto function
   (d) None of these

76. If a packet containing dozen of glasses is dropped which of the following can not be ratio of broken glasses to the unbroken glasses
   (a) 3:1
   (b) 6:1
   (c) 4:2
   (d) None of these

77. If a, b, c are the $T_p$, $T_q$ and $T_r$ Terms of the GP, the value $a^{q-r}b^{r-p}c^{p-q}$ is

**On the basis of following statement compute Questions 80 to 84**

Sumit started walking in east direction from Point A, after walking 15km he reached point B from there he takes a left turn and walked 10km to reach Point C. From C he turns left and walk 7km to reach point D from where he takes left turn and reached point E by walking 34km. He turns right and walks 28 km to reach point F from where he walks 14km by taking right turn and finally reached Point G. From G after taking rest he turns right and walks 32 km to reach the destination at Place H.

78. The direction of G with Respect to A is

79. If Point J is the intersection in A, B and E, D which of the following is true
   (a) H is to the north of J
   (b) JE + JD = (GF - 6)
   (c) J is to the north of D
   (d) None of these

80. Total distance travelled by Sumit in the west side
   (a) 65 km
   (b) 64 km
   (c) 56 km
   (d) None of these

81. What is the direction of Point C with respect to H

82. The direction of F from C is
   (a) South East
   (b) South West
   (c) South
   (d) None of these

**From the statement given below answer Question 85 to 89**

A, B, C, D, E are sitting on a bench. A is sitting next to B. C is sitting next to D. D is not sitting with E, who is sitting on the extreme left. C is on the 2nd position from right side A is to the right of B and E. A and C are sitting together.

83. In which position A is sitting
   (a) Between B and D
   (b) Between B and C
   (c) Between D and E
   (d) None of these

84. Who is sitting in the middle of row

(a) A

(b) B

(c) C

(d) None of these

85. How many students are sitting in the right of B

(a) 3

(b) 1

(c) 2

(d) None of these

86. Who are sitting in the extreme sides

(a) E & C

(b) E & D

(c) E & A

(d) None of these

87. Who is sitting between A and D

(a) C

(b) B

(c) E

(d) None of these

88. Find the missing 5, 7, 21, 55, ?, 215

(a) 117

(b) 109

(c) 114

(d) None of these

89. A theoretical probability distribution.

(a) does not exist

(b) Exists only in theory

(c) exists in real life

(d) both (b)and (c)

90. For a normal distribution with mean as 500 and SD as 120, what is the value of k so that the interval [500, k] covers 40.32 % area of the normal curve? Given $z = 1.30$ at $p = .4032$

91. Reaction in some medicine follow

(a) Normal Distribution

(b) Poisson's Distribution

(c) Binomial Distribution

(d) None of these

92. The regression coefficients are zero if r is equal to

(a) 0

(b) -1

(c) 1

(d) None of these

93. The circular test is an extension of

(a) The Factor Reversal Test

(b) The Rime Reversal Test

(c) The Unit Test

(d) None of these

94. Group index number is represented by

(a) $\dfrac{\text{Price Relative for the year}}{\text{Price Relative for the previous year}} \times 100$

(b) $\dfrac{\sum(\text{Price Relatice} \times w)}{\sum w}$

(c) $\dfrac{\sum(\text{Price Relatice} \times w)}{\sum w} \times 100$

(d) None of these

95. _____ cannot be treated algebraically

(a) Mode

(b) Mean

(c) Median

(d) None of these

96. Coefficient of variation is a relative measure of

(a) Dispersion

(b) Range

(c) Deviation

(d) None of these

97. Computation of deviation is

(a) Relative comparison

(b) Absolute Comparison

(c) Both (a) and (b)

(d) None of these

98. An O-give curve can be prepared in _____ different ways

(a) 2

(b) 3

(c) 4

(d) None of these

99. In a manufacturing unit only 2.50% items produced are defective find probability a lot of 300 items will be free from any manufacturing defect.

100. If a loan of Rs 56 lacs is repayable in 4 years @ 9% p.a. find Fortnightly installment if starting from today.