Test Series: March, 2018

FOUNDATION COURSE

MOCK TEST PAPER

PAPER – 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time Allowed 3 Hours **Maximum Marks: 100**

QUESTIONS

PART A: BUSINESS MATHEMATICS: 40 MARKS

1. P, Q and R three cities. The ratio of average temperature between P and Q is 11: 12 and that between P and R is 9:8. The ratio between the average temperature Q and R

   (a) 22.27

   (b) 27.22

   (c) 32: 33

   (d) none

2. The third proportional between (a^2-b^2) and $(a+b)^2$ is :

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

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

   (c) $\frac{(a-b)^2}{a+b}$

   (d) $\frac{(a+b)^2}{a-b}$

3. If 8th term of an AP is 15, the Sum of the 15 its term is

   (a) 15

   (b) 0

   (c) 225

   (d) 225/2

4. For what values of x, the number $-\frac{2}{7}$, x , $-\frac{7}{2}$ are in G.P.?

   (a) $\pm$ 1

   (b) $\pm$ 3

   (c) $\pm$ 2

   (d) none of these

5. For what value of x; the sequence x+1, 3x, 4x+2 are in AP?

   (a) 3

   (b) 2

   (c) 4

   (d) 5

6. If $a^{1/x} = b^{1/y} = c^{1/z}$ and a,b,c are in GP then x, y, z are in

(a) AP

(b) GP

(c) HP

(d) AGP

7. The derivative of $e^x \log x$

(a) $\frac{e^x}{x}(1+x\log x)$

(b) $\frac{e^x}{x}(1+\log x)$

(c) $(1+\log x)$

8. If y = $\sqrt{\frac{1-x}{1+x}}$ then $(1-x^2)\frac{dy}{dx}$ =

(a) y

(b) -x

(c) -y

(d) 0

9. Find the gradient of the curve $y = 3x^2-5x+4$ at the point (1, 2)

(a) 1

(b) -1

(c) 0

(d) 2

10. The equation of the curve in the form y = f(x) if the cuve passese through the point (1, 0) and Find f'(x) = 2x-1 is

(a) $y = x^2-x$

(b) $x= y^2-y$

(c) $y = x^2$

(d) none of these

11. $\int \frac{1}{x\log x}\,dx$ =?

(a) log|x| + c

(b) log |logx| + c

(c) $(\log x)^2 + c$

(d) none of these

12. $\int_1^2 \frac{2x}{1+x^2}dx$ is equal to

(a) $\log_e(5/2)$

(b) $\log_e 5 - \log_e 2+k$

(c) $\log_e(2/5)$

(d) none of these

13. Find *f o g* for the functions f (x) = x^8, g(x) = $2x^2+1$

(a) $x^8 (2x^2+1)$

(b) x^8

(c) $2x^2+1$

(d) $(2x^2+1)^8$

14. The number of proper subsets of the set {3, 4, 5, 6, 7} is

(a) 32

(b) 31

(c) 30

(d) 25

15. On the sets of lines in a plane the Relation "is perpendicular to" is

(a) Reflexive

(b) Symmetric

(c) Transitive

(d) none of these

16. In how many ways 3 prizes out of 5 van be distributed amongst 3 brothers equally

(a) 10

(b) 45

(c) 60

(d) 120

17. There 12 questions to be answered to be Yes or No. How Many ways this can be answered

(a) 1021

(b) 2048

(c) 4096

(d) None of the above

18. $15C_{3r} = 15\ C_{r+3,}$ then r is equal to

(a) 2

(b) 3

(c) 4

(d) 5

19. A polygon has 44 diagonals then the number of sides are

(a) 6

(b) 7

(c) 8

(d) 9

20. Number ways of painting of a face of a cube by 6 colours is

(a) 36

(b) 6

(c) 24

(d) 20

21. How many Six-digit telephone numbers can be formed by using 10 distinct digits

(a) 10^8

(b) 6^{10}

(c) $10C_9$

(d) $10P_6$

22. $nC_1+nC_2+nC_3+$……=

(a) 2^n-1

(b) 2^n

(c) 2^n+1

(d) none of these

23. The value of $\log_{0.1} 0.001$ =

(a) 3

(b) 2

(c) 4

(d) 1/3

24. if $\log_4 x = -3/2$. Then x is

(a) 1/8

(b) ¼

(c) ½

(d) 1/3

25. A number consists of two digits. The digits in tens place is 3 times the digit in the unit's place. If 54 is subtracted from the digits are reversed. The number is

(a) 39

(b) 92

(c) 93

(d) 94

26. The equation $x^2 -(P+4) x + 2P+5 = 0$ has equal roots

The value of p is

(a) 2

(b) -2

(c) ± 2

(d) 3

27.

x	5	6	7	8
y	11	13	15	17

In the above table corresponding values of two variable x and y have been given. Which of the following equations establishes the relationship between the two variables?

(a) y=3x+2

(b) y=2x–1

(c) y=2x+1

(d) y=3x+1

28. A manufacturer produces two items A and B. He has `10,000 to invest and a space to store 100 its ms. A table costs him `400 and a chair `100. Express this in the form of linear inequalities.

(a) $x + y \leq 100,\ 4x + y \leq 100,\ x \geq 0,\ y \geq 0$

(b) $x + y \leq 1000,\ 2x + 5y < 1000,\ x \geq 0,\ y \geq 0$

(c) $x + y > 100,\ 4x + y \geq 100,\ x \geq 0,\ y \geq 0$

(d) none of these

29. Two matrices A and B are multiplied to get AB if

(a) both are rectangular

(b) both have same order

(c) no of columns of A is equal to rows of B

(d) no of rows of A is equal to no of columns of B

30. If |A| = 0, then A is

(a) zero matrix

(b) singular matrix

(c) non-singular matrix

(d) 0

31. If the order of matrix *A* is *m*×*p*. And the order of *B* is *p*×*n*. Then the order of matrix *AB* is?

(a) m × n

(b) n × m

(c) n × p

(d) m × p

32. if $A=\begin{pmatrix} 2i & 3i \\ 2i & -i \end{pmatrix}$ ($i^2=-1$) then $|A|$ = ?

(a) 2

(b) 8

(c) 4

(d) 5

33. Future value of Ordinary Annuity

(a) $A(n, i) = A\left[\frac{(1+i)^n - 1}{i}\right]$

(b) A(n, i) = A $\left[\frac{(1+i)^n+1}{i}\right]$

(c) A(n, i) = A $\left[\frac{1-(1+i)^n}{i}\right]$

(d) A(n, i) = A $\left[\frac{(1+i)^n-1}{i(1+i)^n}\right]$

34. Nominal rate of Interest 9.9% p.a. If Interest is compounded monthly. What will be the effective rate of Interest? (Given $\left(\frac{4033}{4000}\right)^{12} = 1.1036$

(a) 10.36 %

(b) 9.36%

(c) 11.36%

(d) 9.9 %

35. A machine worth of Rs. 4,90,740 is depreciated at 15% on its opening value each year. When its value reduce to Rs. 2,00,000

(a) 5 years 6 months

(b) 5 years 7 months

(c) 5 years 5 months

(d) none

36. A sinking fund is created redeeming debentures worth Rs. 5,00,000 at the end of 25 years. How much provision need to be made out of profits each year provided sinking fund investments can earn at 4 % per annum

(a) 12,006

(b) 12,040

(c) 12039

(d) 12035

37. Nominal Rate of Return =

(a) Real Rate of Return – Inflation

(b) Real Rate of Return + Inflation

(c) Real Rate of Return / Inflation

(d) Real Rate of Return × Inflation

38. Net Present value≥ 0, then

(a) Accept the Proposal

(b) Reject the proposal

(c) Not Feasible

(d) None of the above

39. A sum of Money doubles itself at compound interest in 10years. In how many years will it become eight times

(a) 10

(b) 30

(c) 40

(d) 35

40. The time in which a sum of money will be doubled at 6% compound interest compounded interest compounded interest compounded annually approximately.

(a) 10 years

(b) 12 years

(c) 13 years

(d) 14 years

PART B: LOGICAL REASONING: 20 MARKS

41. 18, 24, 21, 27, ?, 30, 27

(a) 33

(b) 30

(c) 24

(d) 21

42. 5, 7, 11, ?, 35, 67

(a) 23

(b) 28

(c) 30

(d) 19

43. If GARDEN is coded as 325764 and WATER as 92165, how can we code the word WARDEN in the same way?

(a) 925764

(b) 295764

(c) 952764

(d) 957264

44. If F=6, MAT=34, then how much is CAR?

(a) 21

(b) 22

(c) 25

(d) 28

45. 1, 4, 9, 16, 20, 36, 49

(a) 1

(b) 9

(c) 20

(d) 36

46. 16, 25, 36, 72, 144, 196, 225

(a) 36

(b) 72

(c) 196

(d) 225

47. Mohan starts from point A and walks 1 km towards south, turns left and walks 1 km. Then he turns left again and walks 1 km. Now he is facing

(a) East

(b) West

(c) North

(d) South-West

48. Roopa starts from a point and walks 15 metre towards west, turns left and walks 12 metre, turns right again and walks. What is the direction she is now facing?

(a) South

(b) West

(c) East

(d) North

49. A car travelling from south covers a distance of 8 kms, then turns right and runs another 9 kms and again turns to the right and was stopped. Which direction does it face now?

(a) South

(b) North

(c) West

(d) East

50. There are five houses P, Q, R, S and T. P is right of Q and T is left of R and right of P. Q is right of S. Which house is in the middle?

(a) P

(b) Q

(c) T

(d) R

51. Six friends A, B, C, D, E and F are sitting in a row facing towards North, C is sitting between A and E, D is not at the end, B is sitting at immediate right of E, F is not at the right end, but D is sitting at 3rd left of E. Which of the following is sitting to the left of D?

(a) A

(b) F

(c) E

(d) C

52. Six girls are standing in such a way that they form a circle, facing the centre. Subbu is to the left of Pappu, Revathi is between Subbu and Nisha, Aruna is between Pappu and Keerthna. Who is to the right of Nisha?

(a) Ravathi

(b) Aruna

(c) Subbu

(d) Keerthana

53. A is B's brother. C is D'S father. E is B's mother. A and D are brothers. How is E related to C?

(a) Sister

(b) Sister-in- law

(c) Niece

(d) Wife

54. A is B's brother, C is A's mother, D is C's father, E is B's son, How is B related to D?

(a) Son

(b) Granddaughter

(c) Grandfather

(d) Great Grandfather

55. A is the mother of D and sister of B. B has a daughter C who is married to F. G is the husband of A. How is G related to D?

(a) Uncle

(b) Husband

(c) Son

(d) Father

56. P and Q are brothers. R and S are sister. P's son is S's brother. How is Q related to R?

(a) Uncle

(b) Brother

(c) Father

(d) Grandfather

57. Statements: Some Cats are Rats. All bats are tables. All Rats are Bats. Conclusion:

I. Some Cats are bats

II. All bats are rats

III. All tables are cats

IV. All bats are cats

(a) Only I & II follow

(b) Only II follows

(c) Only I & IV follow

(d) None of these

58. Statements: Some ships are boats. All boats are submarines. Some submarines are yatches. Conclusion:

I. Some yatches are boats.

II. Some submarines are boats.

III. Some submarines are ships.

IV. Some yatches are ships

(a) All follow

(b) Only II and III follow

(c) Only III follows

(d) Only IV follows

59. Statements: All Carrots are birds. Some telephones are Carrots. All bedsheets are telephone. Conclusion:

I. All bedsheet are birds

II. Some bedsheet are birds

III. Some birds are telephone

IV. All telephone are birds

(a) Only I follows

(b) Only II follows

(c) Only I and III follow

(d) Only III follows

60. Statements: Most CPUs are keyboards. No keyboard is a Mouse. All Mouses are CPU. Conclusion:

I. Some keyboards are CPU

II. All CPU's are Mouse

III. No Mouse is a keyboard

IV. Some Mouse are keyboard

(a) Only I follows

(b) Only II and III follow

(c) Only I and III follow

(d) Only II follows

PART: C STATISTICS: 40 MARKS

61. The _____ is satisfied when $P_{ab} \times P_{bc} \times P_{ca} = 1$

(a) Time reversal test

(b) Factor reversal test

(c) Circular Test

(d) none of these

62. The index number of prices at a place in 2008 is 355 with 2003 as base. This means

(a) There has been on the average a 255% increase in prices.

(b) There has been on the average a 355% increase in price.

(c) There has been on the average a 250% increase in price.

(d) None of these.

63. The number of tests of Adequacy

(a) 2

(b) 3

(c) 4

(d) 5

64. If two events A and B are independent, the probability that both will occur is given by

(a) P(A) x P(B)

(b) P (A) + P (B)

(c) P(A) + P(B) – P(AUB)

(d) P(A) + P(B) – P(A∩B)

65. If p: q is the odds in favor of an event, then the probability of that event is

(a) p/q

(b) $\frac{q}{p+q}$

(c) $\frac{p}{p+q}$

(d) none of these

66. If P (A) = 4/9; then the odd against the event 'A' is

(a) 4:9

(b) 4:5

(c) 5:4

(d) 4:14

67. If two letters are taken at random from the word HOME, what is the Probability that none of the letters would be vowels?

(a) 1/6

(b) 1/2

(c) 1/3

(d) ¼

68. Equations of two lines of regression are 4x+3y+7 = 0 and 3x+ 4y + 8 = 0, the mean of x and y are

(a) 5/7 and 6/7

(b) – 4/7 and –11/7

(c) 2 and 4

(d) None of these

69. Correlation Co-efficient is _____ of the units of measurements

(a) Independent

(b) Dependent

(c) Both

(d) none of these

70. If for two variable x and y, the covariance, variance of x and variance of y are 40, 16 and 256 respectively, what is the value of the correlation coefficient?

(a) 0.01

(b) 0.625

(c) 0.4

(d) 0.5

71. Statistics is concerned with
    (a) Qualitative information
    (b) Quantitative information
    (c) (a) or (b)
    (d) Both (a) and (b).
72. The standard deviation of 25, 32, 43, 53, 62, 59, 48, 31, 24, 33 is
    (a) 13.23
    (b) 12.33
    (c) 11.33
    (d) none of these
73. The quartile deviation of a normal distribution with mean 10 and standard deviation 4 is
    (a) 0.675.
    (b) 67.50.
    (c) 2.70
    (d) 3.20.
74. If the range of x is 2, what would be the range of – 3x + 50?
    (a) 2
    (b) 6
    (c) -6
    (d) 44
75. If the quartile deviation of a normal curve is 4.05, then its mean deviation is
    (a) 5.26
    (b) 6.24
    (c) 4.24
    (d) 4.80
76. The mean of first 3 terms is 14 and the mean of next 2terms is 18. The mean of 5 numbers is
    (a) 14.5
    (b) 15
    (c) 14
    (d) 15.6
77. The Standard deviation is independent of change of
    (a) Origin
    (b) Scale
    (c) Both
    (d) none
78. If two variables are uncorrelated then regression lines are
    (a) Parallel
    (b) Perpendicular
    (c) Coincident

(d) Inclined at 45^0

79. When 'p' = 0.5, the

(a) Asymmetrical.

(b) Symmetrical.

(c) Both of above.

(d) None of above

80. In a normal distribution skewness is ___

(a) 0

(b) >3

(c) <3

(d) <1

81. If mean and standard deviation of a binomial distribution is 10 and 4 respectively; q will be ___

(a) 0.4

(b) 0.44

(c) 40

(d) 0.16

82. Which one is not a condition of Poisson model

(a) the probability of having failures in a small time interval is constant

(b) the probability of having success more than one in a small time interval is very small

(c) the probability of having success in this time interval is independent of time 't' as well as earlier success

(d) the probability of having success in a small time interval (t, t+td) is Kt for a positive constant k.

83. In _____ distribution, mean = variance.

(a) Normal

(b) Binomial

(c) Poisson

(d) none of these

84. The points of inflexion of the normal curve $f(t) = \frac{1}{4\sqrt{2\pi}} e^{\frac{-(t-10)^2}{32}}$ are

(a) 6, 14

(b) 5,15

(c) 4,16

(d) none of these

85. The mean of Binomial Distribution is 4 and the Standard Deviation $\sqrt{3}$. what is the value of P.

(a) $\frac{1}{3}$

(b) $\frac{1}{4}$

(c) $\frac{1}{5}$

(d) $\frac{3}{4}$

86. 'Stub' of a table is the _____ part of the table describing the _____.

(a) Left, Columns

(b) Right, Columns

(c) Right, Rows

(d) Left, Rows

87. The pair of averages whose value can be determined graphically?

(a) Mean and Median

(b) Mode and Mean

(c) Mode and Median

(d) None of these

88. Find the Expected value of the following distribution

x	-20	-10	30	75	80
P(x)	3/20	1/5	1/2	1/10	1/20

(a) 20.5

(b) 21.5

(c) 22.5

(d) 24.5

89. Secular trend can be measured by:

(a) Two methods

(b) Three methods

(c) Four methods

(d) Five methods

90. Increase in the number of patients in the hospital due to heat stroke is:

(a) Secular trend

(b) Irregular variation

(c) Seasonal variation

(d) Cyclical variation

91. The multiplicative time series model is:

(a) Y = T + S + C + I

(b) Y = TSCI

(c) Y= a+bx

(d) $y = a+bx+Cx^2$

92. The difference between the upper and lower limit of a class is called

(a) Class Interval

(b) Mid Value

(c) Class Boundary

(d) Frequency

93. A man travels from Delhi to Agra at an average speed of 30km per hour and back at an average speed of 60 km per hour. What's the average Speed.

(a) 48 Km/ hr

(b) 40 km/hr

(c) 45 km/hr

(d) 35 km/hr

94. If the mean of frequency distribution is 100 and coefficient of variation is 45% then standard deviation is.

(a) 45

(b) 0.45

(c) 4.5

(d) 450

95. if the mean and SD of X are a and b respectively, then the S.D of $\frac{x-a}{b}$ is

(a) a/b

(b) -1

(c) 1

(d) ab

96. Standard Error of Correlation coefficient

(a) $\frac{1-r^2}{\sqrt{N}}$

(b) $\frac{1+r^2}{\sqrt{N}}$

(c) $\frac{1+r^2}{N}$

(d) $\frac{1-r}{N}$

97. Probable Error can be obtained using Correlation coefficient as

(a) $0.675 \times \frac{1-r^2}{\sqrt{N}}$

(b) $\frac{2}{3} \times \frac{1+r^2}{\sqrt{N}}$

(c) $\frac{1+r^2}{N}$

(d) $\frac{1-r^2}{r^2}$

98. What is exclusive Series
    (a) In which both upper and lower limit are not included in class frequency
    (b) In which lower limit is not included class frequency
    (c) In which upper limit is not included in class frequency
    (d) None of the above
99. If the arithmetic mean between two numbers is 64 and the Geometric Mean between them is 16 . The Harmonic mean between them is ___
    (a) 64
    (b) 4
    (c) 16
    (d) 40
100. When the mean is 3.57 and mode is 2.13, then the value of median is ___
    (a) 3.09
    (b) 5.01
    (c) 5.01
    (d) none of these.