

MOCK TEST PAPER TEST SERIES -II

FOUNDATION COURSE

PAPER 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS

Time: 2 Hours

Marks: 100

Part A: Business Mathematics and Logical Reasoning

1. If , then x is equal to:
 - (a) 1
 - (b) 3
 - (c) 5
 - (d) 10

2. If $xy + yz + zx = -1$, then the value of $\left(\frac{x+y}{1+xy} + \frac{z+y}{1+zy} + \frac{x+z}{1+zx} \right)$ is
 - (a) xyz
 - (b) $-\frac{1}{yz}$
 - (c) $\frac{1}{xyz}$
 - (d) $\frac{1}{x+y+z}$

3. The salaries of A, B and C are of ratio 2:3:5. if the increments of 15%, 10% and 20% are done their respective salaries, then find new salaries.
 - (a) 23: 33: 60
 - (b) 33:23:60
 - (c) 23: 60:33
 - (d) 33: 60: 23

4. If A: B = 5:3, B:C = 6:7 and C: D = 14:9 then the value of A: B:C:D
 - (a) 20:14:12:9
 - (b) 20:9:12:14
 - (c) 20:9:14:12
 - (d) 20:12:14:9

5. The salary of P is 25% lower than that of Q and the salary of R is 20% higher than Q , the ratio of salary of R and P will be :
 - (a) 5:8
 - (b) 8:5
 - (c) 5:3

- (d) 3:5
6. The cab bill is partly fixed and partly varies on the distance covered. For 456 km the bill is Rs.8252, for 484 km the bill is Rs. 8728. What will the bill be for 500km?
- (a) Rs. 8876
(b) Rs.9156
(c) Rs.9472
(d) Rs.9000
7. $(x + 4)$ is a factor of $x^4 + 4x^3 - ax^2 - bx + 24$. Also, $a + b = 29$. Find the value of b .
- (a) 7
(b) 16
(c) 22
(d) 13
8. X and Y have their present ages in the ratio 6:7. 14 years ago, the ratio of the ages of the two was 4:5. What will be the ratio of their ages 21 years from now?
- (a) 7: 11
(b) 9: 10
(c) 8: 11
(d) 11: 13
9. The equation $3x^2 + mx + n = 0$ has roots that are double that of the equation $x^2 + 10x + 12 = 0$. What is the value of $m + n$?
- (a) 104
(b) 204
(c) 102
(d) 202
10. What is the smallest integral value of n for which $n^3 + 7n^2 - 50n - 336 > 0$
- (a) 8
(b) 6
(c) 7
(d) None of the above
11. If α and β are the roots of the equation $x^2 + 7x + 12 = 0$, then the equation whose roots $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ will be
- (a) $x^2 - 14x + 49 = 0$
(b) $x^2 - 24x + 144 = 0$
(c) $x^2 - 50x + 49 = 0$
(d) $x^2 - 19x + 49 = 0$
12. The value of 'k' for system of equations $kx + 2y = 5$ and $3x + y = 1$ has no solution is:
- (a) 5
(b) $\frac{2}{3}$
(c) 6
(d) $\frac{3}{2}$

13. On the average, experienced person does 5 units of work while a fresh one 3 units of work daily, but the employer have to maintain the output at least 30 units of work per day. The situation can be expressed as
- $5x+3y \leq 30$
 - $5x+3y \geq 30$
 - $5x+3y = 30$
 - None of these
14. The sum of money doubles itself in 10 years. The number of years it would be treble itself is:
- 25 years
 - 15 years
 - 20 years
 - None
15. Arun purchased a vaccum cleaner by giving ₹1700 as cash down payment, which will be followed by five EMIs of ₹480 each. The vaccum cleaner can also be bought by paying ₹3900 cash. What is the approx. rate of interest p.a. (at simple interest) under this instalment plan?
- 18%
 - 19%
 - 22%
 - 20%
16. Present Value of a five year annuity is Rs. 2,000. If the rate of interest is 8% p.a., what is the amount of each annuity payment?
- Rs.500.9
 - Rs.463.8
 - Rs.363.1
 - Rs.486.4
17. Abdul has taken a loan from Bahadur at 7% p.a. The loan has to be repaid in three equal yearly instalments of Rs. 10,000 each. What is the amount of loan taken?
- Rs.25,467
 - Rs.26,897
 - Rs.26,243
 - None of the above
18. A took a loan from B. The loan is to be repaid in annual installments of Rs. 2,000 each. The first instalment is to be paid three years from today and the last one is to be paid 8 years from today? What is the value of loan today, using a discount rate of eight percent?
- Rs.9,246
 - Rs.7,927
 - Rs.8,567
 - None of the above
19. If the cost of capital be 12% per annum, then the Net Present Value (in nearest Rs.) from the given cash flow is given as

Year	0	1	2	3
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Operating Profit (in thousand Rs.)	(100)	60	40	50
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- (a) Rs.34048
- (b) Rs.34185
- (c) Rs.51048
- (d) Rs.21048

20. Let the operating profit of a manufacturer for five years is given as

Year	1	2	3	4	5	6
Operating Profit (in lakh Rs.)	90	100	106.4	107.14	120.24	157.35

Calculate Compound Annual Growth Rate (CAGR)

- (a) 9%
 - (b) 12%
 - (c) 11%
 - (d) 13%
21. If a sum triples itself in 15 years at simple rate of interest, the rate of interest per annum will be:
- (a) 13%
 - (b) 13.3%
 - (c) 13.5%
 - (d) 18.0%
22. What will be population after 3 years when present population is 25,000 and population increases at the rate of 3% in I year, at 4% in II year and 5% in III year?
- (a) Rs.28,119
 - (b) Rs.29,118
 - (c) Rs.27,000
 - (d) Rs.30,000
23. The future value of an annuity of Rs.1500 made annually for five years at interest of 10% compounded annually is (Given that $(1.1)^5 = 1.61051$)
- (a) Rs.9517.56
 - (b) Rs.9157.65
 - (c) Rs.9715.56
 - (d) Rs.9175.65
24. Find the effective rate of interest equivalent to the nominal rate of 7% converted monthly:
- (a) 7.26%
 - (b) 7.22%
 - (c) 7.02%
 - (d) 7.20%
25. How much will be Rs.25,000 to in 2 years at compound interest if the rates for the successive years are at 4% and 5% per year

- (a) Rs.27,300
 (b) Rs.27,000
 (c) Rs.27,500
 (d) Rs.27,900
26. A box contains 3 pink caps, 2 purple caps and 4 orange caps. In how many ways they can be arranged so that the caps of the same colour come together. (Assume all caps of same colour are not identical)
- (a) 1724
 (b) 1728
 (c) 1732
 (d) 1764
27. ${}^{15}C_3 + {}^{15}C_{13}$ is equal to:
- (a) ${}^{16}C_3$
 (a) ${}^{30}C_{16}$
 (c) ${}^{15}C_8$
 (d) ${}^{15}C_{15}$
28. There are 12 questions to be answered in Yes or No. How many ways can these be answered?
- (a) 1024
 (b) 2048
 (c) 4096
 (d) None
29. In how many ways 3 Prizes can be distributed among 3 students equally
- (a) 10
 (b) 45
 (c) 60
 (d) 120
30. The sum of the first 3 terms in an AP is 18 and that of the last 3 is 28. If the AP has 13 terms, what is the sum of the middle three terms?
- (a) 23
 (b) 18
 (c) 19
 (d) None of the above
31. The ratio of sum of first n natural numbers to that of sum of cubes of first n natural numbers is
- (a) 3:16
 (b) $n(n+1) / 2$
 (c) $2 / n(n+1)$
 (d) None of the above
32. If the sum of terms of an Arithmetic Progression is $2n^2$, the fifth term is.

- (a) 20
 (b) 50
 (c) 18
 (d) 25
33. The number of words that can be formed out of the letters of the word "ARTICLE" so that vowels occupy even places is
 (a) 36
 (b) 144
 (c) 574
 (d) 754
34. Let Z be the universal set for two sets – A and B. If $n(A) = 300$, $n(B) = 400$ and $n(A \cap B) = 200$, then $n(A' \cap B')$ is equal to 400 provided $n(Z)$ is equal to
 (a) 900
 (b) 800
 (c) 700
 (d) 600
35. In a group of students 80 can speak Hindi, 60 can speak English and 40 can speak Hindi and English both, then number of students is:
 (a) 100
 (b) 140
 (c) 180
 (d) 60
36. if $f(x) = x^2 - 1$ and $g(x) = 2x + 3$ then $g \circ f(3)$
 (a) 71
 (b) 61
 (c) 41
 (d) 19
37. $\int 2^{3x} \cdot 3^{2x} \cdot 5^x dx =$
 (a) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(270)} + C$
 (b) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(360)} + C$
 (c) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(180)} + C$
 (d) $\frac{2^{3x} \cdot 3^{2x} \cdot 5^x}{\log(90)} + C$

38. Marginal cost and marginal revenue of a commodity is $C'(x)=8+6x$ and $R'(x)=30$. Fixed cost is 0. Find the total profit.
- $22x + 3x^2$
 - $22x - 3x^2$
 - $22x - x^2$
 - $x + 3x^2$
39. Find the value of $\int dx$
- 3
 - 3
 - 0
 - 1
40. A total cost function of a company RXL Ltd is $C(x) = 10+50x-30x^2+x^3/3$ Where x denotes the output. Find the output level at which the profit is maximum if price function is given by $450-30x$
- 30
 - 40
 - 50
 - 20
41. Find out the next term of the series 4, 25, 121, 289, _____
- 529
 - 441
 - 625
 - None of the above
42. Which number should come next \rightarrow 7, 13, 13, 14, 19, 15 ?
- 15
 - 25
 - 19
 - None of the above
43. Find out the wrong number. 2,10,18,54,162,486,1458
- 18
 - 10
 - 54
 - 162
44. In a certain code, "Delhi is capital" is coded as "7 5 9", "capital are beautiful" is coded as "3 6 9", "Delhi is beautiful" is coded as "6 7 5", "Patna also capital" is coded as "9 2 4". What is code for "beautiful" ?
- 2
 - 4
 - 6
 - 9
45. If 'SYSTEM' is coded as 131625 then 'TERMS' will be coded as ?

- (a) 62251
 - (b) 62451
 - (c) 64251
 - (d) 62415
46. Pointing to a photograph Lalita says, "He is the son of the only son of my grandfather." How is the man in the photograph related to Lalita?
- (a) Brother
 - (b) Uncle
 - (c) Cousin
 - (d) Data is inadequate
47. Pointing to a photograph. Ram said, "He is the son of the only daughter of the father of my brother." How is Ram related to the man in the photograph?
- (a) Nephew
 - (b) Brother
 - (c) Father
 - (d) Maternal Uncle
- (48-49) Read the following information carefully and answer the questions given below ? There are six children playing football, namely P, Q, R, S, T and U. P and T are brothers, U is sister of T, R is the only son of P's uncle, Q and S are the daughters of the only brother of R's father**
48. How many female players are there?
- (a) one
 - (b) two
 - (c) three
 - (d) Four
49. How is S related to P
- (a) Uncle
 - (b) Sister
 - (c) Niece
 - (d) Cousin
50. Pointing towards photograph. Vinod said "she is the daughter of my wife's mother's only daughter ". How is Vinod related to the girl in the Photograph?
- (a) Cousin
 - (b) Uncle
 - (c) Father
 - (d) None
51. Kamal starts from point 'O' and moved towards North 2 km, then he turns right and moved 4 km again he turned towards North and walked up to 1 km reached at A. Find the distance between OA.
- (a) 6
 - (b) 7
 - (c) 4

- (d) 5
52. When a person faces north and walks 25 m right, and he turns left and walks 20 m and again he turns right 25 m and turns right and walks 40 m in which direction is he now from his starting point.
- (a) North-West
 - (b) North –East
 - (c) South- East
 - (d) South-West
53. Sanjay started from his house towards west. After a walking a distance 15 km he turned to the right and walked 10 km, he again turned to the right and walked 5 km. After this he turns left at 135° and covered 10 km in which direction should he is going?
- (a) South
 - (b) South-West
 - (c) South-East
 - (d) North –West
54. Raju Walked from A to B in the east 10 m, then he turns towards right and walked 3 m. Again, he turned to the right and walked 14 m. how far is from is she from point A?
- (a) 4 feet
 - (b) 5 feet
 - (c) 12 feet
 - (d) 13 feet
55. Mamtha moved a distance of 75 m towards north, then she turns to the left and walked to about 25 m, turned left again and walks 80 m. Finally, she turns to the right at angle of 45° . In which direction was she is moving finally?
- (a) South-East
 - (b) South-West
 - (c) North-West
 - (d) North-East
56. Five students A, B, C, D, and E are standing in a row. D is right on the E; B is on the left of E but on the right of A. D is next to C on his left. The student in middle is
- (a) B
 - (b) E
 - (c) C
 - (d) A
57. Five children are sitting in row. S is sitting next to P but not T. K is sitting next to R, who is sitting on the extreme left and T is not sitting next to K . Who are adjacent to S.
- (a) K+P
 - (b) R+P
 - (c) Only P
 - (d) P and T

(58-60) Directions to solve

- (a) p, Q, R, S, T, U, V and W are sitting round the circle and facing the centre.
(b) P is second to the right of T who is neighbour of R and V.
(c) S is not the neighbour of U.
(d) V is neighbour of U.
(e) Q is not between S and W. W is not between u and S
58. Who is immediate left of V?
(a) P
(b) U
(c) R
(d) T
59. What is the position of R
(a) Between P and T
(b) Second to the right of S
(c) to the immediate right of W
(d) inadequate data
60. Which are not following are not neighbour
(a) UV
(b) VT
(c) RV
(d) PQ

Part B: Statistics

61. Salaries of employees working in ABC limited is as follows:

Salaries (In thousands)	below 10	below 20	below 50	below 100	below 1000
Number of employees	28	34	65	84	123

Find the number of employees with salaries more than 50k?

- (a) 65
(b) 84
(c) 39
(d) 58
62. Which of the following is not a criteria for ideal measure of central tendency?
(a) It should be ambiguously defined
(b) It should be simple to compute
(c) It should be based on all the observations
(d) None of these
63. Which of the following is not an example of continuous variable?
(a) Temperature in India
(b) Profit of Company X

- (c) Number of road accidents
 - (d) A person's height
64. At ABC Ltd, the average age of employees is 36. Average age of male employees is 38 and that of females is 32. Find the ratio of female to male in the company.
- (a) 1:3
 - (b) 2:1
 - (c) 1:2
 - (d) 3:1
65. The mean height of girls in class is 162cm while for boys is 182cm. The ratio of number of girls: boys is 1:2. Find the mean height of the whole class
- (a) 170 cm
 - (b) 180 cm
 - (c) 154 cm
 - (d) None of these
66. In the equation $4x+2y = 3$, quartile deviation for y is 3. Find the quartile deviation for x.
- (a) 4.5
 - (b) 6
 - (c) 1.5
 - (d) None of these
67. The Standard deviation is independent of change of
- (a) Scale
 - (b) Origin
 - (c) Both (a) and (b)
 - (d) None of these
68. Find D6 for the following observations. 7, 9, 5, 4, 10, 15, 14, 18, 6, 20
- (a) 11.40
 - (b) 12.40
 - (c) 13.40
 - (d) 13.80
69. If all the observations are decreased by 4, find the relation between new SD and old SD.
- (a) New SD = Old SD/2
 - (b) New SD = Old SD - 2
 - (c) New SD = Old SD - 4
 - (d) Remains unchanged
70. Standard deviation of first n natural number is 2. What is the value of n?
- (a) 7
 - (b) 6
 - (c) 5
 - (d) 8

71. Find the variance of $3x+2$ if standard deviation of x is 4
- (a) 9
 - (b) 160
 - (c) 16
 - (d) 144
72. If the variance of $x = 148.6$ and mean of $x = 40$, then the coefficient of variation is
- (a) 37.15
 - (b) 30.48
 - (c) 33.75
 - (d) None of these
73. The average of 10 observations is 14.4. If the average of first four observations is 16.5. The average of remaining 6 observations is :
- (a) 13.6
 - (b) 13.0
 - (c) 13.2
 - (d) 12.5
74. If the rates return from three different shares are 100%, 200% and 400% respectively. The average rate of return will be.
- (a) 350%
 - (b) 233.33%
 - (c) 200%
 - (d) 300%
75. For a 4×7 classification of bivariate data, the maximum number of conditional distributions is :
- (a) 11
 - (b) 28
 - (c) 35
 - (d) None
76. The coefficients of correlation between two variables x and y is the simple _____ of two regression coefficients.
- (a) Harmonic Mean
 - (b) Arithmetic Mean
 - (c) Geometric Mean
 - (d) None of the above
77. There are two equations: $m + 3p = 2$ and $6n + 2q = 1$. Correlation coefficients for p and q is 0.5. Find the correlation coefficients of m and n
- (a) 0.6
 - (b) 0.5
 - (c) -0.5
 - (d) None of these

78. If $r=0$, regression lines are:
- (a) Perpendicular
 - (b) Parallel
 - (c) They coincide
 - (d) Cannot be determined
79. Below scatter diagram shows what type of correlation
- (a) Perfect negative correlation
 - (b) Negative correlation
 - (c) Positive correlation
 - (d) Perfect positive correlation
80. Number of defects in clothes a garments showroom will form a
- (a) Poisson distribution
 - (b) Normal distribution
 - (c) Binomial distribution
 - (d) Cannot be determined
81. If X and Y are two random variables and if $E(X) = 3$ and $E(Y) = 6$, then $E(XY) = ?$
- (a) 3
 - (b) 6
 - (c) 18
 - (d) 24
82. An unbiased coin is tossed 6 times. Find the probability that the tosses result in heads only,
- (a) $1/64$
 - (b) $5/64$
 - (c) $10/64$
 - (d) None of these
83. Find the two numbers if AM and GM is 10 and 6 respectively
- (a) 6, 6
 - (b) 12, 8
 - (c) 9, 4
 - (d) 18, 2
84. Probability distribution may be
- (a) Discrete
 - (b) Continuous
 - (c) Infinite
 - (d) (a) or (b)
85. In a certain Poisson frequency distribution, the probability corresponding to two success is half the probability corresponding to three successes. The mean of the distribution is
- (a) 6

- (b) 12
(c) 3
(d) 2.45
86. The normal curve is
(a) Positively skewed
(b) Negatively skewed
(c) Symmetrical
(d) All these
87. An example of a bi-parametric discrete Probability distribution is
(a) Binomial distribution
(b) Poisson Distribution
(c) Normal Distribution
(d) Both (a) and (b)
88. For a normal distribution $Q1 = 54.32$ and $Q3 = 78.86$, then the median of the distribution is
(a) 12.17
(b) 39.43
(c) 66.69
(d) None of these
89. What is the mean of X having the following density function $f(x) = \frac{1}{4\sqrt{2\pi}} e^{-\frac{(x-10)^2}{32}}$ for $-\infty < x < \infty$
(a) 10
(b) 4
(c) 40
(d) None of these
90. In a Binomial Distribution $B(n, p)$, $n = 4$, then $P(x=2) = 3 P(x=3)$ find P
(a) $1/3$
(b) $2/3$
(c) $6/4$
(d) $4/3$
90. One card is drawn from a pack of 52, what is the probability that is a king or queen ?
(a) $11/13$
(b) $2/13$
(c) $1/13$
(d) None of these
91. The probability that a leap year has 53 Wednesday is
(a) $2/7$
(b) $5/3$
(c) $2/3$

- (d) $1/7$
92. A coin is tossed six times, then the probability of obtaining heads and tails alternatively is
- (a) $1/2$
 (b) $1/64$
 (c) $1/32$
 (c) $1/16$
93. Two different dice are thrown simultaneously, then the probability, that the sum of two numbers appearing on the top of dice 9 is
- (a) $8/9$
 (b) $1/9$
 (c) $7/9$
 (d) None of these
94. The probability distribution of the demand for a commodity is given below

Demand (x)	5	6	7	8	9	10
Probability: P(x)	0.05	0.10	0.30	0.40	0.10	0.05

- The expected value of demand will be :
- (a) 7.55
 (b) 7.85
 (c) 1.25
 (d) 8.35
95. A bag contains 4 Red and 5 Black balls. Another bag contains 5 Red and 3 Black balls. If one ball is drawn at random each bag. Then the probability that one Red and One Balck is
- (a) $12/72$
 (b) $25/72$
 (c) $37/72$
 (d) $13/72$
96. If Laspyres index number is 250 and Paschees index number is 160, them Fishers Index number is
- (a) 200
 (b) 120
 (c) 150
 (d) 170
97. Which is called an ideal index number
- (a) Laspyres Index number
 (b) Pasches Index number
 (c) Fishers Index number
 (d) Marshall- Edgeworth Index number
98. The circular test is an extension of
- (a) The time reversal test

- (b) The factor reversal test
 - (c) The Unit test
 - (d) None of these
99. Circular test is satisfied by
- (a) Laspyres Index number
 - (b) Paschhes index number
 - (c) The simple geometric mean of price geometric mean of price relatives and price relatives and weighted aggregative with fixed weights.
 - (d) None of these
100. If the price of a commodity in a place have decreased by 30% over the based period places, then the index number of that place is
- (a) 30
 - (b) 60
 - (c) 70
 - (d) 80