FOUNDATION COURSE EXAMINATION
JUNE 2025
FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS
(Notations and Symbols used are as usual.)

Time Allowed: 1 hour

Full Marks: 100 (2×50)

SECTION I: FUNDAMENTALS OF BUSINESS MATHEMATICS (2×20=40 marks)

1. The triplicate ratio of 1 : 2 is
- (A) 2 : 3
- (B) 8 : 1
- (C) 1 : 8
- (D) 1 : 4

2. The ratio of two numbers is 3 : 4 and their product is 1452. The smallest between the two numbers is
- (A) 22
- (B) 33
- (C) 44
- (D) 11

3. What is sum of the mean proportional between 1.4 and 35 and the third proportional to 6 and 9?
- (A) 20.5
- (B) 18.5
- (C) 16.5
- (D) 21.5

4. If x varies jointly with y and cube root of z, when $x = 4$, $y = 2$ and $z = 27$. If $x = 8$, $y = 3$, the value of z is
- (A) 6
- (B) 27
- (C) 8
- (D) 64

5. A sum was put at simple interest at a certain rate for 3 years. Had it been put at 2% higher rate, it would have fetched ₹ 360 more. The sum is
- (A) ₹ 4,800
- (B) ₹ 6,000
- (C) ₹ 4,500
- (D) ₹ 3,600

6. A person saves ₹ 1 on the first day, ₹ 3 on the second day, ₹ 5 on the third day and so on. What is the saving (in ₹) on the 20th day?
- (A) 39
- (B) 42
- (C) 400
- (D) 390

7. If ₹ 1,000 is deposited at the end of each year for a period of 5 years at an interest rate 10%p.a., then the Future Value Interest Factor for Annuity (Regular) is
- (A) 5.610
- (B) 6.501
- (C) 6.105
- (D) 5.160

8. A car has travelled to a destination at a speed S with time taken T. If the distance is now doubled and speed is half of its previous speed, then the time taken by the car is
- (A) T
- (B) $2T$
- (C) $\frac{1}{2}T$
- (D) $4T$

9. Find the value of x if $\log_x 3 + \log_x 9 + \log_x 729 = 9$.
- (A) 2
- (B) 3
- (C) 4
- (D) 6

10. The number of terms to be taken so that $1 + 2 + 4 + 8 + \ldots$ will be 8191, is
- (A) 13
- (B) 12
- (C) 11
- (D) 10

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11. The difference between the roots of the equation $x^2 - 7x - 9 = 0$ is

(A) 7

(B) 9

(C) $\sqrt{85}$

(D) $2\sqrt{85}$

12. If $2^x = 4^y = 8^z$ and $\dfrac{1}{2x} + \dfrac{1}{4y} + \dfrac{1}{4z} = 4$, then the value of x is

(A) $\dfrac{7}{19}$

(B) $\dfrac{7}{23}$

(C) $\dfrac{7}{17}$

(D) $\dfrac{7}{16}$

13. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ be the universal set, $P = \{1, 2, 5\}$ and $Q = \{6, 7\}$ be the two subsets. The set $(P \cap Q')$ is

(A) P

(B) Q

(C) P'

(D) Q'

14. In how many ways can final eleven players be selected from 15 players if one of them, who is in bad form, must always be excluded?

(A) 463

(B) 346

(C) 364

(D) 436

15. Find the value of $(a + 1)$, when $(a - 2)! \times 120 = (a + 1)!$.

(A) 6

(B) 5

(C) 4

(D) 10

16. If $f(x) = \dfrac{1}{3}x^3 - \dfrac{1}{2}x^2 - 2x$, then find the points where $f(x)$ has maximum and minimum values.

(A) maximum, $x = 1$, minimum, $x = -2$

(B) maximum, $x = -1$, minimum, $x = -2$

(C) maximum, $x = 1$, minimum, $x = 2$

(D) maximum, $x = -1$, minimum, $x = 2$

17. The price of a commodity is ₹55 per unit and the cost function is $C(x) = 30x + 250$. Find the break-even point.

(A) 12

(B) 10

(C) 15

(D) 18

18. Determine the value of k for which the function

$$f(x) = \frac{x^2 - 9}{x - 3}, \text{ for } x \neq 3$$
$$= k, \text{ for } x = 3$$

is continuous at $x = 3$.

(A) 18

(B) 12

(C) 9

(D) 6

19. If $y = e^x x^2$, then $\dfrac{d^2 y}{dx^2}$ is

(A) $e^x(x^2 + 4x + 2)$

(B) $e^{2x}(x^2 + 4x + 2)$

(C) $e^x(x^2 + 4x)$

(D) $e^x(x^2 + 2x + 2)$

20. The demand function of a certain product is $p = 200 + 20x - x^2$, where x is the number of units demanded and p is the price per unit. Find the marginal revenue when $x = 10$ units are sold.

(A) 320

(B) 420

(C) 300

(D) 460

SECTION II: FUNDAMENTALS OF BUSINESS STATISTICS *(2×30=60 marks)*

21. Mr. X collected some field data for his research. Subsequently Ms. Y used the same data for her research. Then which of the following statements is true?

   (A) Both Mr. X and Ms. Y used primary data.

   (B) Both Mr. X and Ms. Y used secondary data.

   (C) Mr. X used primary data but Ms. Y used secondary data.

   (D) Mr. X used secondary data but Ms. Y used primary data.

22. Which diagram is suitable for representing the cumulative frequency distribution of heights of soldiers?

   (A) Ogive

   (B) Histogram

   (C) Line diagram

   (D) Scatter diagram

23. Fill in the gap: In world export, a country contributes 40 per cent of the total world export. In pie diagram, it represents _____ degree.

   (A) 180

   (B) 144

   (C) 120

   (D) 136

24. The frequency density of a class of a grouped frequency distribution is defined as

   (A) Class frequency / Total frequency

   (B) Class frequency / Class-mark

   (C) Total frequency / Class frequency

   (D) Class frequency / Width of the class

25. If the arithmetic mean of n natural numbers with respective weights $1, 2, 3, ..., n$ be 15, then the value of n is

   (A) 24

   (B) 23

   (C) 22

   (D) 18

26. If the median of the observations $7, 11, 2x - 1, 2x + 1, 23$ and 29 written in ascending order is 18, the value of x is

   (A) 9

   (B) 6

   (C) 12

   (D) 13

27. What is the arithmetic mean of the median and the mode of the data given below?

$5, 10, 3, 6, 4, 8, 9, 3, 15, 2, 9, 4, 19, 11, 4$

   (A) 6

   (B) 5

   (C) 4.5

   (D) 5.5

28. Find the standard deviation from the following data:

$$N = 10, \ \Sigma fx = 60, \ \Sigma fx^2 = 1000$$

(A) 64

(B) $\sqrt{96}$

(C) 8

(D) 4

29. Find the coefficient of variation, if the sum of the squares of deviations from mean 50 of 10 observations is 250.

(A) 50%

(B) 10%

(C) 12%

(D) 8%

30. Find the quartile deviation of daily wages (in ₹) of seven persons given:

312, 207, 215, 210, 319, 412, 328

(A) 62

(B) 63

(C) 59

(D) 72

31. For a frequency distribution, $(Q_1 + Q_3) = 100$ and the median is 38. If the Bowley's coefficient of skewness is 0.6, what are the values of Q_1 and Q_3?

(A) $Q_1 = 30, Q_3 = 70$

(B) $Q_1 = 20, Q_3 = 80$

(C) $Q_1 = 40, Q_3 = 60$

(D) $Q_1 = 10, Q_3 = 90$

32. The harmonic mean of 1, 2 and 4 is

(A) 7/3

(B) 3/7

(C) 7/12

(D) 12/7

33. Find the Spearman's rank correlation coefficient from the given data:

$$\Sigma d_i^2 = 70, \ n = 6.$$

(A) -1

(B) 1

(C) 0.32

(D) -0.68

34. If the regression lines are $4x - 5y + 33 = 0$ and $20x - 9y = 107$, the correlation coefficient is

(A) -0.6

(B) $+0.6$

(C) ± 0.6

(D) 0.8

35. If the correlation coefficient of two variables x and y is r_{xy}, then the correlation coefficient of $u = \dfrac{x-a}{b}, (b \neq 0)$ and $v = \dfrac{y-c}{d}, (d \neq 0)$ is

(A) bdr_{xy}

(B) $\left(\dfrac{b}{d}\right) r_{xy}$

(C) $\left(\dfrac{a}{b} + \dfrac{c}{d}\right) r_{xy}$

(D) r_{xy}

36. If the correlation coefficient $r_{xy} = +1$, then the regression line y on x is

    (A) parallel to the x-axis.

    (B) parallel to the y-axis.

    (C) up-ward straight line.

    (D) down-ward straight line.

37. "Rain has affected very badly the wheat crop" is an example of

    (A) secular trend

    (B) cyclical movement

    (C) seasonal movement

    (D) irregular movement

38. Calculate the simple average of price relative index for the current year from the given data:

Item	Price per unit (in ₹) of current year	Price per unit (in ₹) of base year
I	30	25
II	25	30

    (A) 203.33

    (B) 101.7

    (C) 100

    (D) 50.8

39. If the current year prices and base year prices for all items are same but the quantities of items for current year are double of the quantities of the items for the base year, then Laspeyres' price index number is

    (A) 50

    (B) 150

    (C) 100

    (D) 200

40. If $P(A \cap B) = 0$ and $P(A \cup B) = 1$, then events A and B are

    (A) mutually exclusive but not exhaustive.

    (B) neither mutually exclusive nor exhaustive.

    (C) not mutually exclusive but exhaustive.

    (D) mutually exclusive and exhaustive.

41. If $P(A) = \frac{3}{8}, P(B) = \frac{1}{2}$ and $P(A \cup B) = \frac{3}{4}$, then $P(A|B)$ is

    (A) $\frac{2}{3}$

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

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

    (D) $\frac{3}{5}$

42. The probability that a leap year selected at random will have 53 Fridays is

    (A) $\frac{1}{7}$

    (B) $\frac{2}{7}$

    (C) $\frac{2}{3}$

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

43. Calculate the 3-year weighted moving average for the year 2018 from the following data. Apply the weights 0.3, 0.4 and 0.3.

Year: 2016 2017 2018 2019 2020

Production

units: 20   22   24   23   25

(in thousand)

(A) 23

(B) 24

(C) 23.1

(D) 23.9

44. If Fisher's and Laspeyres' price index numbers are respectively 129 and 132.5, the Paasche's price index number is

(A) 126.4

(B) 124.7

(C) 122.8

(D) 125.6

45. The expression for the event "neither A nor B occurs" is

(A) $(A' \cup B')$

(B) $(A \cup B)'$

(C) $(A' \cap B)$

(D) $(A \cap B')$

46. An urn contains 2 red and 1 green balls and another urn contains 2 red and 2 green balls. An urn is selected at random and a ball is drawn randomly from it. If the ball is found to be red, then what is the probability that the ball is selected from the first urn?

(A) $\frac{4}{7}$

(B) $\frac{3}{7}$

(C) $\frac{2}{3}$

(D) $\frac{7}{12}$

47. Calculate the correlation coefficient from the following data:

$$n = 7, \ \Sigma xy = 25, \ \Sigma x^2 = 28, \ \Sigma y^2 = 34$$

where $x = X - \bar{X}, y = Y - \bar{Y}$.

(A) 0.81

(B) 0.18

(C) 0.85

(D) 0.58

48. If $\Sigma P_n Q_n = 500$, $\Sigma P_0 Q_0 = 100$, $\Sigma P_n Q_0 = 300$, $\Sigma P_0 Q_n = 200$, find the Fisher's quantity index number for the "nth" year with base year "0".

(A) 54.77

(B) 183.33

(C) 273.86

(D) 182.57

49. The mean score of a group of 100 students is 45. Later it was found that the score 55 was misread as 75 and one score 60 was taken extra. Find the corrected mean score.

(A) 44.65

(B) 44.20

(C) 44.40

(D) 45.05

50. If 10 occurs 17 times, 8 occurs 15 times and 6 occurs 18 times, then the median is

(A) 8

(B) 10

(C) 15

(D) 18

FUNDAMENTALS OF BUSINESS ECONOMICS AND MANAGEMENT

Time Allowed: 1 hour   *Full Marks: 100 (2×50)*

Choose the correct option from the four alternatives given.

SECTION A: FUNDAMENTALS OF BUSINESS ECONOMICS (70 marks)

51. A good can be considered a normal good, if an increase in the income of a consumer causes _____ in demand of the given good.
- (A) increase
- (B) no change
- (C) decrease
- (D) less than proportionate increase

52. Which of the following costs declines continuously?
- (A) Average Variable Cost
- (B) Marginal Cost
- (C) Total Fixed Cost
- (D) Average Fixed Cost

53. 'Homogenous product' is a characteristic of _____.
- (A) Perfect Competition only
- (B) Perfect Oligopoly only
- (C) both (A) and (B)
- (D) none of the above

54. The objectives of business are related to _____.
- (A) survival
- (B) customer satisfaction
- (C) employee welfare
- (D) all of the above

55. Another name for Bank Reserve Ratio is _____.
- (A) Cash Reserve Ratio
- (B) Statutory Liquid Ratio
- (C) Variable Reserve Ratio
- (D) Bank Rate

56. Which of the following is not a market structure in Economics?
- (A) Perfect Competition
- (B) Monopoly
- (C) Duopoly
- (D) Intense Competition

57. Which of the following will lead to shift in the PPF?
- (A) Upgradation of technology
- (B) Exploration of new oil reserves
- (C) Massive unemployment
- (D) none of the above

58. Given a Legal Reserve Ratio of 20%, an initial deposit of ₹ 1,000 in a banking system would create secondary deposit of _____.
- (A) ₹ 3,000
- (B) ₹ 4,000
- (C) ₹ 5,000
- (D) ₹ 6,000

59. The PESTEL Analysis is _____.
- (A) simple to understand and tough to implement
- (B) simple to understand and quick to implement
- (C) tough to understand and easy to implement
- (D) tough to understand and tough to implement

60. The MP Curve intersects the AP Curve, when the AP is _____.
- (A) minimum
- (B) constant
- (C) maximum
- (D) falling

61. Consider the following table:

Production possibilities	A	B	C	D	E
Guns (units)	0	1	2	3	4
Butter (units)	10	9	7	4	0

The Opportunity Cost of increasing the production of guns from 2 units to 3 units is _____ units of butter.

(A) 7
(B) 2
(C) 4
(D) 3

62. The most fearful situation in the banking industry is the accumulation of _____.

(A) interest payable to depositors
(B) non-performing assets
(C) unutilised deposits
(D) unpaid employee wages

63. If there is no change in quantity demanded to any change in price, then demand is _____ and demand curve is _____.

(A) perfectly elastic, horizontal straight line
(B) perfectly elastic, vertical straight line
(C) perfectly inelastic, horizontal straight line
(D) perfectly inelastic, vertical straight line

64. In the short run, if P > ATC in a Monopolistic Competition, the firm _____.

(A) earns profit and new firms enter the market
(B) earns profit and bars entry of new firms
(C) incurs losses and exits the market
(D) earns quick profits and disappears

65. Expenditure incurred by the producers to promote sale of their products is termed as _____.

(A) explicit cost
(B) implicit cost
(C) selling cost
(D) fixed cost

66. Who regulates money supply?

(A) Govt. of India
(B) Reserve Bank of India
(C) Commercial Banks
(D) Planning Commission

67. Uncertainty means _____.

(A) abundance of clarity
(B) lack of clarity
(C) lack of confidence
(D) none of the above

68. If $MU_X / P_X > MU_Y / P_Y$, then to reach the equilibrium position, the consumer should _____.

(A) stop buying any commodity
(B) buy both the commodities in equal quantity
(C) buy more of X and less of Y
(D) buy more of Y and less of X

69. The firm and the industry are one and the same in _____.

(A) Monopolistic Competition
(B) Monopoly
(C) Perfect Competition
(D) Oligopoly

70. Which one of the following is termed as legal tender money?

(A) Demand Deposits
(B) Time Deposits
(C) Inter-bank Deposits
(D) Currency Notes

71. The alphabet 'V' in VUCAFU stands for
_____.

(A) Violence

(B) Victory

(C) Volatility

(D) Victimisation

72. If the consumption of an additional unit of a commodity causes no change in Total Utility, then the resultant Marginal Utility is _____.

(A) zero

(B) positive

(C) negative

(D) constant

73. 'Toothpaste' is a product of which of the following market forms?

(A) Monopolistic Competition

(B) Monopoly

(C) Duopoly

(D) Perfect Competition

74. Which of the following is not a limitation of the barter system?

(A) Lack of double coincidence of wants

(B) Lack of store of value

(C) Lack of common measure of value

(D) Lack of transfer of value

75. Which of the following banks operates in public interest without any profit motive?

(A) Reserve Bank of India

(B) State Bank of India

(C) ICICI Bank

(D) Punjab National Bank

76. In India, paper notes are _____.

(A) limited legal tender

(B) ulimited legal tender

(C) both (A) & (B)

(D) none of the above

77. Pricing for selling the same commodity at different prices is known as _____.

(A) Skimming Pricing

(B) Differential Pricing

(C) Penetration Pricing

(D) Cost-plus Pricing

78. What will be the effect of increase in the Repo Rate on the money supply?

(A) increase

(B) decrease

(C) remains same

(D) increase initially then decrease

79. Shut down situation for a firm comes when
_____.

(A) price is equal to fixed cost

(B) price is more than average fixed cost

(C) price is less than average variable cost

(D) price is more than average variable cost

80. OPEC is an example of _____.

(A) Perfect Competition

(B) Monopolistic Competition

(C) Monopoly

(D) Cartel

81. The lender of last resort is a function of the
_____.

(A) Central Government

(B) Central Bank

(C) Commercial Bank

(D) EXIM Bank

82. Which of the following is a characteristic of a price-taker firm?

(A) $TR = P \times Q$

(B) AR = Price

(C) MR = Price

(D) all of the above

83. Deficit Financing means _____.

(A) financing budgetary deficit by borrowing

(B) financing budgetary deficit by printing money

(C) both (A) & (B)

(D) none of the above

84. Demand Curve under Perfect Competition is _____.

(A) downward sloping

(B) horizontal

(C) upward sloping

(D) vertical

85. Reverse Repo Rate is the rate at which the Central Bank of any country _____.

(A) lends money to the commercial banks for short-term

(B) lends money to the commercial banks for long-term

(C) accepts deposits from the commercial banks

(D) none of the above

SECTION B: FUNDAMENTALS OF MANAGEMENT (30 marks)

86. _____ is the process that involves the growth of an employee.

(A) Transfer

(B) Development

(C) Merit Rating

(D) none of the above

87. The blend of top-down and bottom-up approaches in Planning is known as _____.

(A) Top-Bottom approach

(B) Up-Down approach

(C) Composite approach

(D) Team approach

88. The process of Communication starts with the _____.

(A) supervisor

(B) sender

(C) receiver

(D) none of the above

89. Absenteeism and labour turnover are reduced in case of the following type of leadership:

(A) Autocratic

(B) Democratic

(C) Free rein

(D) none of the above

90. Who developed a theory of Motivation on the basis of hypotheses relating to human behaviour?

(A) McGregor

(B) Adams

(C) Vroom

(D) Herzberg

91. An example of physiological need is
_____.

(A) pension scheme
(B) competence
(C) work groups
(D) none of the above

92. In the Managerial Grid, the style of management which depicts the leader who is neither concerned about the people nor does he/she care about the task to be performed is _____.

(A) Task Management
(B) Impoverished
(C) Country Club
(D) Team Management

93. The first step in the decision-making process is _____.

(A) identifying and diagnosing the real problem
(B) evaluation of the alternatives
(C) developing the alternatives
(D) implementing the best alternative

94. Brainstorming is one of the _____ techniques.

(A) creative
(B) assertive
(C) heuristic
(D) none of the above

95. The decision taken by the lower-level management is a _____ decision.

(A) programmed
(B) non-programmed
(C) major
(D) none of the above

96. 'Management is a _____ process'. Choose the incorrect option.

(A) goal-oriented
(B) universal
(C) continuous
(D) rigid

97. _____ is defined as the process of obtaining and maintaining capable and competent people to fill all the positions from the top to the operative level.

(A) Staffing
(B) Selection
(C) Recruitment
(D) Training

98. Which of the following methods are employed to provide on-the-job training?

(A) Coaching
(B) Job Rotation
(C) Mentoring
(D) all of the above

99. _____ is the artery of an organisation through which the decisions and instructions of the management flow down to the lowest level.

(A) Communication
(B) Information
(C) Message
(D) none of the above

100. A thirsty person may use body language by lifting the thumb to his/ her mouth in order to communicate that he/she needs drinking water. This process is called _____.

(A) Medium
(B) Encoding
(C) Decoding
(D) Feedback