FOUNDATION COURSE EXAMINATION

DECEMBER 2025

FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS 316361

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

SECTION I: FUNDAMENTALS OF BUSINESS MATHEMATICS *(40 marks)*

(Notations and symbols used are as usual.)

1. The mean proportional between 1.4 gm and 5.6 gm is

(A) 2.8 gm
(B) 28 gm
(C) 3.2 gm
(D) 32 gm

2. The 9th term of an AP –2, –5, –8, –11 ... is

(A) – 16
(B) – 27
(C) – 29
(D) – 26

3. The first term and common ratio of a GP are 4 and 1/2 respectively. The 5th term of the series is

(A) 1/2
(B) 1/4
(C) 1
(D) 1/64

4. Find the sum of ten terms of the series 2, 4, 6, 8, 10, 12, 14, ,

(A) 110
(B) 104
(C) 108
(D) 112

5. A sum of money is doubled in 5 years at simple interest. The rate of interest is

(A) 15%
(B) 20%
(C) 10%
(D) 5%

6. If $3^x = \frac{1}{243}$, then the value of x is

(A) 5
(B) 4
(C) – 5
(D) – 4

7. If $(10)^x = (100)^y = (1000)^z$, then $x : y : z$ is

(A) 6 : 2 : 3
(B) 1 : 2 : 3
(C) 2 : 3 : 6
(D) 6 : 3 : 2

8. log144 is equal to

(A) 2log4 + 2log2
(B) 3log2 + 4log3
(C) 4log2 + 2log3
(D) 3log2 + 2log3

9. The value of (2! + 3!)× 0! is

(A) 0
(B) 5
(C) 120
(D) 8

10. In how many ways five members can be selected for a committee out of 11 members of a club where a particular member will always exist in the committee?

(A) 210
(B) 462
(C) 252
(D) 330

11. The number of proper subsets of the set {a, e, i, o, u} is

(A) 32
(B) 31
(C) 30
(D) 28

12. For the function $y = x^3 - 3x$ the value of x at which $\frac{dy}{dx} = 0$, is

(A) ± 1
(B) $+1$
(C) ± 3
(D) $\pm\sqrt{3}$

13. If ${}^9P_r = 504$, the value of r is

(A) 4
(B) 3
(C) 5
(D) 2

14. The present value of an annuity of ₹1000 received annually for 4 years at a discount rate of 5% is approximately

(A) ₹ 3445
(B) ₹ 3455
(C) ₹ 3554
(D) ₹ 3545

15. If the roots of a quadratic equation are 2 and -3, then the equation is

(A) $(x+2)(x+3) = 0$
(B) $(x-2)(x+3) = 0$
(C) $(x-2)(x-3) = 0$
(D) $(x+2)(x-3) = 0$

16. The cost function of a perfect competitive firm is $C(x) = x^2 + 5x + 5$, where x denotes the level of output. The market price of the product is ₹ 17 per unit. Find the profit maximizing output of the firm.

(A) 4 units
(B) 7 units
(C) 8 units
(D) 6 units

17. The value of $\log\frac{75}{16} - \log\frac{25}{81} + \log\frac{32}{243}$ is

(A) log5
(B) log 4
(C) log2
(D) log3

18. x varies inversely with the sum of y and z, and $x = 4$ when $y = 5$ and $z = 3$. What is the value of z, when $y = 3$ and $x = 8$?

(A) 1
(B) 2
(C) 3
(D) 4

19. If $f(x) = ax + b$ and $f(-1) = 3, f(1) = 5$, then the value of $f(2)$ is

(A) 0
(B) 1
(C) 6
(D) 4

20. A bike rider and a cycle rider travel from city A to city B. The time taken by the cycle rider is double of the time taken by the bike rider. The ratio of velocities of bike and cycle is

(A) 1 : 1
(B) 2 : 1
(C) 1 : 2
(D) 1 : 4

SECTION II: FUNDAMENTALS OF BUSINESS STATISTICS *(60 marks)*

21. A pie diagram is used to represent the following data:

Source	:	A	B	C	D
Revenue (in'0000 ₹)	:	120	180	240	180

The central angle corresponding to source C is

(A) 140°
(B) 120°
(C) 130°
(D) 125°

22. Which part of a statistical table contains the observed values?

(A) Stub
(B) Caption
(C) Source notes
(D) Body

23. Find the frequency density of the class interval 11–15 from the following frequency distribution:

Class interval	:	4–6	7–10	11–15	16–21
Frequency	:	2	6	5	8

(A) 5/21
(B) 0.5
(C) 1
(D) 1.25

24. The measure of central tendency based on all observations of a variable is

(A) Mean
(B) Median
(C) Mode
(D) Variance

25. The geometric mean of the numbers 4, 6 and 9 is

(A) 6
(B) 18
(C) 12
(D) 24

26. Find the mode of the following frequency distribution:

x	:	5	10	15	20	25
f	:	4	9	6	3	5

(A) 10
(B) 9
(C) 25
(D) 15

27. Find the geometric mean of $\frac{1}{4}, \frac{1}{8}, \frac{1}{16}$.

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

(B) 8

(C) 4

(D) $\frac{1}{8}$

28. Calculate the median for the following frequency distribution:

Class	:	0-7	7-14	14-21	21-28	28-35	35-42
Cumulative frequency (less than)	:	7	18	42	61	73	82

(A) 20.17

(B) 20.71

(C) 21.07

(D) 21.70

29. For an ungrouped dataset $n = 15, \Sigma x = 480, \Sigma x^2 = 15735$, the standard deviation is

(A) 25

(B) 6.4

(C) 32

(D) 5

30. If the AM and the CV of a variable x are 5 and 20% respectively, then the variance of x is

(A) 100

(B) 10

(C) 1

(D) 25

31. The mean deviation about 4 of the following numbers of 0, 9, 5 and 6 is

(A) 12

(B) 3

(C) 0.75

(D) 0

32. The relationship between two variables is represented by the

(A) histogram

(B) ogive

(C) scatter diagram

(D) frequency curve

33. If $x = X - \overline{X}, y = Y - \overline{Y}, \Sigma x^2 = 90, \Sigma xy = 60, \Sigma y^2 = 62.5$, then $r_{xy} = ?$

(A) 0.65

(B) 0.80

(C) 0.85

(D) 0.75

34. State which of the following is ***false***.

(A) Correlation coefficient is the geometric mean of the regression coefficients.

(B) Correlation coefficient is independent of change of scale and origin of the observations.

(C) If the variables are connected by a perfect linear relation, then the value of correlation coefficient is either – 1 or + 1.

(D) Correlation coefficient depends on units of measurements of the variables.

35. In a music competition two judges have given the following ranks to four competitor:

Competitor	:	1	2	3	4
Judge A	:	1	2	3	4
Judge B	:	1	2	4	3

The rank correlation is

(A) 0.4
(B) 0.5
(C) 0.8
(D) 0.7

36. If $\bar{x} = 10, \bar{y} = 20$, $r_{xy} = 0.6$, $\sigma_x^2 = 2.25$, $\sigma_y^2 = 4$, the regression line y on x is

(A) $y = 0.3375x + 16.625$
(B) $y = 0.3375x + 3.25$
(C) $y = 0.45x + 15.5$
(D) $y = 0.8x + 12$

37. If the regression coefficients of two variables are 0.4 and 0.9, find the correlation coefficient.

(A) 0.6
(B) -0.6
(C) ∓ 0.6
(D) 0.65

38. Which of the following is ***true***?

(A) $0 \le r_{xy} \le 1$
(B) $-1 < r_{xy} < 1$
(C) $-1 \le r_{xy} \le 1$
(D) $-1 < r_{xy} \le 1$

39. The probability of an event A lies in the interval

(A) $0 < P(A) < 1$
(B) $0 < P(A) < \infty$
(C) $0 \le P(A) \le 1$
(D) $0 \le P(A) < \infty$

40. Three coins are tossed simultaneously. What is the probability of getting exactly 2 heads?

(A) 3/8
(B) 1/4
(C) 1/8
(D) 1/3

41. If a die is thrown two times in succession, what is the probability of getting the sum 7?

(A) 1/8
(B) 1/6
(C) 5/36
(D) 1/3

42. Two balls are drawn randomly from a bag containing 4 white and 6 black balls. The probability that the drawn balls are white is

(A) 2/15
(B) 3/5
(C) 1/10
(D) 2/3

43. Probability of occurrence of at least one of the events A and B is denoted by

(A) $P(AB)$

(B) $P(A + B)$

(C) $P(A) + P(B)$

(D) $P(A|B)$

44. A card is drawn randomly from a pack of 52 cards. Find the probability that the card is either a red or a king.

(A) 17/52

(B) 29/52

(C) 15/26

(D) 7/13

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

(A) 1/4

(B) 1/6

(C) 1/2

(D) 1/3

46. Find the index number for the year 2024, taking 2023 as base from the following data by aggregative method:

Commodity	:	A	B	C	D
Price in 2023 (in ₹)	:	30	40	90	90
Price in 2024(in ₹)	:	35	50	95	110

(A) 116

(B) 106

(C) 125

(D) 120

47. If $\Sigma P_0Q_0 = 1360$, $\Sigma P_nQ_0 = 1900$, $\Sigma P_0Q_n = 1324$, $\Sigma P_nQ_n = 1880$, then the Laspeyres' Price Index number is

(A) 188.0

(B) 139.7

(C) 142.0

(D) 97.4

48. If the observed value, trend, seasonal variation, cyclical variation and irregular movement of a time series are denoted by Y, T, S, C and I respectively, then the multiplicative model is

(A) $Y = T \times S \times C + I$

(B) $Y = (T + S) \times (C + I)$

(C) $Y = T \times S \times C \times I$

(D) $Y = T + (S \times C \times I)$

49. 3-year moving averages for 2012 and 2013 are 23 and 33 respectively. If the value for the year 2011 is 17, then the value for 2014 is

(A) 47

(B) 27

(C) 28

(D) Cannot be determined

50. Using arithmetic mean of price relatives, compute the quantity index from the following data:

Commodity	:	A	B	C	D	E	F
Base year quantity	:	20	30	10	25	50	40
Current year quantity	:	25	30	15	35	55	45

(A) 125.22

(B) 122.92

(C) 127.25

(D) 121.29

FUNDAMENTALS OF BUSINESS ECONOMICS AND MANAGEMENT

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

SECTION A: FUNDAMENTALS OF BUSINESS ECONOMICS *(70 marks)*

51. Which one of the following is a central problem of an economy?
(A) When to produce?
(B) Where to produce?
(C) How much to produce?
(D) none of the above

52. Production Possibility Curve is_____.
(A) downward sloping and convex to the origin
(B) downward sloping and concave to the origin
(C) upward sloping and convex to the origin
(D) upward sloping and concave to the origin

53. Which one of the following statements correct?
(A) Demand schedule shows the list of quantity demanded of different goods at the same price.
(B) Market demand schedule is the vertical summation of the individual demand schedules.
(C) Demand schedule shows the list of quantity demanded of different goods at different prices.
(D) Market demand schedule is the horizontal summation of the individual demand schedules.

. At which point of the linear demand e, point elasticity is minimum?
(A) at the mid-point
(B) at the bottom point
(C) at the upper most point
(D) at any point of the linear demand curve

55. In which one of the following cases, extension of supply of a product will take place?
(A) increase in the price of the concerned product
(B) decrease in the number of suppliers
(C) increase in the subsidy on the inputs used
(D) increase in the GST on the product

56. Which one of the following cost curves is continuously falling as the output increases?
(A) Average Fixed Cost Curve
(B) Marginal Cost Curve
(C) Average Variable Cost Curve
(D) Average Total Cost Curve

57. Which one of the following values the Marginal Product (MP) does not take?
(A) zero
(B) negative
(C) positive
(D) cannot be defined

58. If, in an economy, demand increases while supply remains constant, then there will be _____.
(A) increase in both the equilibrium price and the equilibrium quantity
(B) decrease in both the equilibrium price and the equilibrium quantity
(C) increase in price but decrease in quantity
(D) increase in price but no change in quantity

59. Selling Cost is a feature of _____.
(A) Monopoly
(B) Oligopoly
(C) Monopolistic Competition
(D) both (B) and (C)

60. _____ reflects different prices for different groups of consumers.
(A) First Degree of Price Discrimination
(B) Second Degree of Price Discrimination
(C) Third Degree of Price Discrimination
(D) Uniform Pricing

61. In case of Perfect Competition, _____.
(A) AR = MR
(B) AR > MR
(C) AR < MR
(D) AR is falling

62. In which one of the following markets, there is no entry and no exit of the firm?
(A) Monopoly
(B) Oligopoly
(C) Monopolistic Competition
(D) Perfect Competition

63. In Economics a _____ is a formal association of independent firms or individuals which or who decide to restrict the market supply and/or fix prices, aiming to increase profits and market dominance.
(A) Monopoly
(B) Cartel
(C) Dominant Oligopoly
(D) Discriminant Monopoly

64. A monopolist firm in the short-run can earn _____.
(A) supernormal profits
(B) normal profits
(C) losses
(D) any one of the above

65. Close substitute of a product is a feature of which market?
(A) Monopoly
(B) Oligopoly
(C) Monopolistic Competition
(D) Perfect Competition

66. As a pricing strategy, Price Leadership can be seen in _____.
(A) Discriminant Monopoly
(B) Duopoly
(C) Oligopoly
(D) Monopolistic Competition

67. In Perfect Competition, _____.
(A) advertisement cost is taken into account
(B) a firm can take a decision on the amount of quantity to be produced
(C) the factors of production are immobile
(D) number of buyers are small

68. On the basis of the number of sellers, which market has least sellers?
(A) Monopoly
(B) Duopoly
(C) Monopsony
(D) Monopolistic Competition

69. Which one of the following is considered as narrow money in India?
(A) M0
(B) M1
(C) M2
(D) M3

70. Which one of the following is not considered as a cause of Inflation?
(A) increase in indirect tax
(B) increase in international price of gold
(C) increase in unproductive expenditure by the Government
(D) increase in money supply by the Central Bank

71. Temporary loan facilities provided by the RBI to the State Governments and the Central Government is known as _____.

(A) Ways and Means Advances
(B) Standing Deposit Facility
(C) Market Stabilizing Bond
(D) Open Market Operations

72. Which one of the following organizations does not provide industrial credit?

(A) IFCI
(B) SFC
(C) SIDC
(D) NABARD

73. Which one of the following is not a money market instrument?

(A) Treasury Bill
(B) Commercial Paper
(C) Debenture
(D) Certificate of Deposits

74. SDR (Special Drawing Rights) of IMF now comprises a basket of _____ currencies.

(A) 5
(B) 4
(C) 6
(D) 3

75. To control inflation, the RBI might resort _____.

(A) reducing the CRR
(B) increasing the Repo Rate
(C) Open Market Operations
(D) all of the above

76. _____ is a public sector company mandated to acquire and aggregate non-performing assets.

(A) SBI
(B) IFCI
(C) NARCL
(D) SIDBI

77. SEBI is the primary regulatory body for overseeing and regulating the functioning of India's _____.

(A) insurance companies
(B) stock exchanges
(C) pension funds
(D) commercial banks

78. The Monetary Policy in India is framed by the _____.

(A) Ministry of Finance
(B) SEBI
(C) RBI
(D) SBI

79. Under the PESTEL framework, "S" stands for _____.

(A) Sound
(B) Science
(C) Social
(D) Sustainable

80. Which one of the following is not a part of the micro environment?

(A) suppliers
(B) competitors
(C) customers
(D) technological innovations

81. Which one of the following is not a criterion for decision-making under uncertainty?

(A) Maximax criterion
(B) Utility Maximization criterion
(C) Laplace criterion
(D) Minimax criterion

82. Which one of the following is not a part of the internal business environment?
(A) employee
(B) raw material
(C) vendor
(D) money

83. Globalization, as a part of the Indian macro environment, does not include _____.
(A) FEMA
(B) devaluation
(C) membership of different Trade Blocks
(D) encouraging FDI

84. The authorized agency of managing e-Rupee in India is the _____.
(A) Bank of Digital Currency
(B) National Payment Corporation of India
(C) Clearing Corporation of India Ltd.
(D) RBI

85. Micro environment is also called as the _____.
(A) general environment
(B) operating environment
(C) political environment
(D) economic environment

SECTION B: FUNDAMENTALS OF MANAGEMENT *(30 marks)*

86. Which one of the following statements is correct?
(A) Management is a goal-oriented process.
(B) Management is a continuous process.
(C) Management is a dynamic process.
(D) all of the above.

87. Name the function of management which bridges the gap between where we are and where we want to go.
(A) Planning
(B) Staffing
(C) Organizing
(D) Leading

88. Which one of the following is not a Content Theory?
(A) Maslow's Hierarchy of Needs theory
(B) Vroom's Expectancy theory
(C) Herzberg's Two-factor theory
(D) McClelland's Acquired Needs theory

89. _____ suggests that individuals compare their own input/outcome ratio (e.g., efforts put in versus compensation received) with that of the others (e.g., colleagues, friends).
(A) Acquired Needs theory
(B) Equity theory
(C) Expectancy theory
(D) Two-factor theory

90. The decisions which are frequent and repetitive in nature are called _____.
(A) programmed decisions
(B) non-programmed decisions
(C) operating decisions
(D) organizational decisions

91. Who introduced the concept of the five functions of management?
(A) Peter Drucker
(B) Frederick Taylor
(C) Henri Fayol
(D) Elton Mayo

92. The management function that involves evaluating employee performance and providing feedback is known as _____.

(A) Planning
(B) Organizing
(C) Leading
(D) Controlling

93. What is the last step in the decision-making process?

(A) identifying the alternatives
(B) implementing the best alternative
(C) evaluating the alternatives
(D) recognizing the need for a decision

94. _____ is a mental shortcut or a rule of thumb that helps make quick decisions and judgments without having to think through every detail.

(A) Simulation
(B) Linear Programming
(C) PERT
(D) Heuristic

95. Which is not a characteristic of the Control phase?

(A) setting the target
(B) preparing the budget
(C) changing the control process
(D) measuring the performance

96. According to Herzberg, which one of the following is a maintenance factor?

(A) salary
(B) job enrichment
(C) recognition
(D) achievement

97. Communication begins with _____.

(A) encoding
(B) idea generation
(C) channel selection
(D) decoding

98. The form of organization known for giving rise to rumors is called _____.

(A) centralized organization
(B) formal organization
(C) decentralized organization
(D) informal organization

99. Who among the following is an agent?

(A) shareholder
(B) manager
(C) debt financer
(D) donor

100. Which one of the following is not concerned with staffing?

(A) recruitment
(B) training
(C) publicity
(D) selection