Syllabus 2022

P-3(FBMS)

651828

FOUNDATION COURSE EXAMINATION

JUNE 2026

FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS

Time Allowed: 1 hour

Full Marks: 100 (2×50)

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

(Notations and symbols used are as usual.)

1. The ratio of salaries of A and B is 3:4. If B's salary is increased by $\frac{7}{2}\%$ of his total salary, it becomes ₹1,24,200. Find the salary of A (in ₹).

(A) 90,000

(B) 1,20,000

(C) 1,05,000

(D) 1,12,000

2. If $\frac{2x+4}{x+1}$ is the duplicate ratio of $\sqrt{5}:\sqrt{2}$, the value of x is

(A) 2

(B) 3

(C) 4

(D) 5

3. If x be the mean proportional of 9 and 16, then the value of x is

(A) 144

(B) 12

(C) 5

(D) ± 12

4. "x varies directly as y", is written as

(A) $x \propto \frac{1}{y}$

(B) $x^2 \propto y$

(C) $x \propto y$

(D) $x \propto \frac{1}{y^2}$

5. A sum of money at simple interest doubles in 10 years. In how many years, at the same rate, will it be tripled?

(A) 30

(B) 25

(C) 15

(D) 20

6. A sum of money at compound interest amounts to thrice itself in three years. In how many years will it be 9 times itself?

(A) 12

(B) 9

(C) 8

(D) 6

7. Find the 8th term of an AP series, where the first term is 1000 and the common difference is –150.

(A) 100

(B) –100

(C) 2050

(D) –50

8. The 7th term of the series 3, –9, 27, ... is

(A) 2187

(B) –2187

(C) 729

(D) –729

9. The ratio of work done by $(x+2)$ men in $(x-2)$ days to that by $(x-1)$ men in $(x+1)$ days is 4:5. The value of x is

(A) ± 4

(B) 6

(C) 4

(D) ± 6

10. If P be the set of all prime numbers and $N = \{x : 0 \leq x \leq 9\}$, then $N - (P \cap N)$ is

(A) $\{0, 4, 6, 8\}$

(B) $\{1, 2, 4, 6, 8\}$

(C) $\{1, 4, 6, 8, 9\}$

(D) $\{0, 1, 4, 6, 8, 9\}$

11. A truck travels 120 km to a depot at 60 km/hr and returns 120 km at 40 km/hr. Find the average speed (km/hr).

(A) 48

(B) 64

(C) 56

(D) 84

12. The simplest value of $4(8)^{\frac{2}{3}}$ is

(A) 8

(B) 16

(C) 32

(D) 4

13. The value of $\log_3 \sqrt{3}$ is

(A) $\sqrt{2}$

(B) $\frac{1}{\sqrt{2}}$

(C) 2

(D) $\frac{1}{2}$

14. If $x! + 3! = 126$, then x is

(A) 8

(B) 5

(C) 6

(D) 7

15. Which one of following statements is TRUE?

(A) ${}^{n}c_{n} > {}^{n}c_{0}$

(B) ${}^{n}c_{n} < {}^{n}c_{0}$

(C) ${}^{n}c_{n} = {}^{n}c_{0}$

(D) ${}^{n}c_{n} + {}^{n}c_{0} = 1$

16. The values of x satisfying the equation $x^2 + 2x + 1 = 0$ are

(A) $(-1, -1)$

(B) $(1, -1)$

(C) $(1, 0)$

(D) $(1, 1)$

17. If product of the roots of the quadratic equation $ax^2 + 2x + 6 = 0$ is 3, then the sum of the roots is

(A) $-\frac{1}{2}$

(B) $\frac{1}{2}$

(C) -1

(D) 1

18. Given the cost function is $c = 3x^3 - 60x^2 + 50x$ where x is the level of output. Find the level of output at which the average cost is a mininum.

(A) 10 units

(B) $\frac{40}{3}$ units

(C) 5 units

(D) $\frac{20}{3}$ units

19. If $f(x-1) = \frac{2x-3}{3x+5}$, then $f(2)$ is

(A) $\frac{1}{11}$

(B) $-\frac{1}{2}$

(C) $\frac{3}{14}$

(D) $\frac{3}{8}$

20. If 60% students passed in Mathematics, 70% students passed in Statistics and 20% students failed in both subjects, then the percentage of students passed in Mathematics only is

(A) 50

(B) 10

(C) 20

(D) 40

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

21. Mother tongue of a person is

(A) Discrete variable

(B) Continuous variable

(C) Attribute

(D) Any of these

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

Source:	I	II	III	IV
Revenue (in '000 ₹):	18	12	18	24

The central angle corresponding to source III is

(A) 130°

(B) 90°

(C) 140°

(D) 125°

23. The following data relate to the income of 80 persons:

Income: (in ₹)	1500-1999	2000-2499	2500-2999	3000-3499
No. of: persons	10	30	25	15

What is the percentage of persons earning at least ₹ 2500?

(A) 45

(B) 50

(C) 52

(D) 55

24. Find the *odd* one from the following:

(A) Mean

(B) Median

(C) Mode

(D) Mean Deviation

25. The average marks of all ten students in a test is 42. The marks of five students are 42, 68, 55, 52 and 53. Find the average marks of the remaining five students.

(A) 30

(B) 28

(C) 35

(D) 25

26. Find the mode of the observations 7, 7, 5, 5, 3, 5, 7, 3, 5.

(A) 5

(B) 7

(C) 6

(D) 3

27. The median of a series of observations 12, 16, 13, 18, 17, 19, 21 is

(A) 16

(B) 17

(C) 18

(D) 19

28. The sum of deviations of n observations from the mean is always

(A) > 0

(B) ≤ 0

(C) $= 0$

(D) ≥ 0

29. Find the 3rd quartile of the following observations: 3, 7, 6, 4, 0, 8, –1, 5, 2.

(A) 2.5

(B) 6.5

(C) 4

(D) 7

30. A measure of central tendency is to find out the

(A) variability of the observations.

(B) central value of the observations.

(C) minimum value of the observations.

(D) maximum value of the observations.

31. If the mean and the standard deviation of a set of observations are 50 and 25 respectively, then the coefficient of variation is

(A) 50%
(B) 100%
(C) 25%
(D) 200%

32. The correlation coefficient of two variables x and y is independent of

(A) change of origin only
(B) change of scale only
(C) both change of origin and scale
(D) neither change of origin nor change of scale

33. If the rank correlation coefficient between marks in management and mathematics for a group of students is 0.6 and the sum of squares of the differences in ranks is 66, then the number of students in the group is

(A) 9
(B) 10
(C) 11
(D) 12

34. The slope of regression line y on x is written as

(A) r_{xy}
(B) b_{xy}
(C) b_{yx}
(D) both b_{xy} and b_{xy}

35. The regression line of y on x is $y = 4 - 0.2x$. Find the predicted value of y when $x = 5$.

(A) 2.9
(B) 3.9
(C) 3.1
(D) 3

36. The two regression lines are $x = 0.85y + 9.48$ and $y = 0.99x + 1$. Find the approximate values of the means $(\bar{x}, \bar{y})$ of the variables.

(A) (65.2, 65.55)
(B) (62.55, 67.76)
(C) (65.55, 65.2)
(D) (67.76, 62.55)

37. Calculate the correlation coefficient of the following data having some missing values:

x:	6	2	10	4	?
y:	9	11	?	8	7

Given, mean of $x = 6$ and mean of $y = 8$.

(A) 0.85
(B) −0.85
(C) 0.92
(D) −0.92

38. Given the following data:

Average rainfall of a place = 40 cm, standard deviation of rainfall = 3 cm, mean wheat yield = 800 quintal, standard deviation of wheat yield = 10 quintal and correlation coefficient = 0.6. Estimate the wheat yield (in quintal) of the place in a year if the rainfall is 72 cm.

(A) 772
(B) 753.84
(C) 864
(D) 824

39. If S denotes the sum of the probabilities of an event E and its compliment E^c, then S is

(A) 0

(B) 1

(C) $\frac{1}{2}$

(D) $0 < S < 1$

40. Two persons A and B appear for an interview for two vacancies. The probability of selection of A is 1/3 and that of B is 1/5. Find the probability that only one of them will be selected.

(A) 2/5

(B) 4/5

(C) 3/5

(D) 1/5

41. If an unbiased coin is tossed once, the events head (H) and tail (T) are

(A) equally likely but not mutually exclusive.

(B) mutually exclusive but not equally likely.

(C) both mutually exclusive and equally likely.

(D) neither mutually exclusive nor equally likely.

42. If a perfect die is thrown two times in succession, what is the probability of getting the sum 8?

(A) 1/18

(B) 1/6

(C) 5/36

(D) 1/3

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

(A) 2/15

(B) 3/5

(C) 1/10

(D) 1/3

44. A card is drawn randomly from a well shuffled pack of 52 cards. Find the probability that the card is either a black or a queen.

(A) 17/52

(B) 15/26

(C) 29/52

(D) 7/13

45. If $P(A|B) = 0.25$, then the value of $P(A^c|B)$ is

(A) 0.75

(B) 0.5

(C) 0.3

(D) 0.8

46. Find the trend value for the year 2023 of the following series using a 3-year weighted moving average with weights 1, 2, 1:

Year:	2021	2022	2023	2024	2025
Value:	2	4	5	7	8

(A) 3.75

(B) 5.75

(C) 3.5

(D) 5.25

47. If $\Sigma P_0 Q_0 = 1360$, $\Sigma P_n Q_0 = 1900$, $\Sigma P_0 Q_n = 1324$, $\Sigma P_n Q_n = 1880$, then the Paasche's Price Index number is

(A) 188.0

(B) 139.7

(C) 142.0

(D) 97.4

48. The consumer price index number for the year 2025 was 313 with 2020 as the base year. The average monthly wage of the workers in a factory in 2025 was ₹ 160. The real wage (in ₹) is

(A) 40.30

(B) 46.20

(C) 48.20

(D) 51.12

49. 3-year moving averages for 2016 and 2017 are 20 and 30 respectively. If the value for the year 2018 is 45, then the value for 2015 is

(A) 15

(B) 20

(C) 23

(D) Cannot be determined

50. From the following data, construct a price index number for the year 2020 taking 2015 as base year:

price for the year 2015 = ₹ 5.30 and price for the year 2020 = ₹ 7.95.

(A) 105

(B) 120

(C) 125

(D) 150