FOUNDATION EXAMINATION SET 1
MODEL QUESTION PAPER TERM – JUNE 2023
PAPER - 3
FUNDAMENTALS OF BUSINESS MATHEMATICS AND STATISTICS

Time Allowed: 1 Hour **Full Marks: 100**

Answer all questions. Each question carries 2 marks.

1. A class consists of 48 male students and 23 female students. Find the ratio of female students to total strength of the class.
   (a) 23:48 O
   (b) 48:23 O
   (c) 48:71 O
   (d) 23:71 O

2. If 4, 6, p, 27, q are in continued proportion, find the values of p and q.
   (a) $p = 9, q = 9$ O
   (b) $p = 9, q = 81$ O
   (c) $p = 81, q = 9$ O
   (d) $p = 81, q = 81$ O

3. If a Stadium having spectators divided into groups of Young Generation and Old Generation and the number of young spectators are 1525 and old spectators are 1875. Find the ratio of Total Spectators to Young Spectators.
   (a) 136:75 O
   (b) 136:85 O
   (c) 75:61 O
   (d) 136:61 O

4. Find two numbers whose mean proportional is 8 and the 1st number is square of the 2nd number.
   (a) 8,8 O
   (b) 4,2 O
   (c) 16,4 O
   (d) 64,8 O

5. The ratio of the pocket money saved by Rakesh and his sister is 5:6. If the sister saves ₹60 more, how much more the brother should save in order to keep the ratio of their savings unchanged?
   (a) ₹60 O
   (b) ₹40 O
   (c) ₹50 O
   (d) ₹70 O

6. AMS & Co. borrows ₹1,20,000 for one year at 15% annual interest, compounded monthly. Find their monthly payment.
   (a) ₹ 11,380 O
   (b) ₹ 10,830 O
   (c) ₹ 11,430 O
   (d) ₹ 10,740 O

7. A certain sum of money invested at a certain rate of compound interest doubles in 8 years. In how many years will it become 16 times?
   (a) 31 years O
   (b) 28 years O
   (c) 30 years O
   (d) 32 years O

8. Find the value of a, if $(a - 2)! \times 24 = (a + 1)!$
   (a) 0 O
   (b) 2 O
   (c) 4 O
   (d) 3 O

9. What would be the factorial notation for: 11×10×9×8×7
   (a) 11! / 6! O
   (b) 11! / 5! O
   (c) 10! / 6! O
   (d) 10! / 5! O

10. How many ways can 8 people get vaccinated from 8 vaccinators, assuming no vaccinator is idle?
   (a) 40320 ways. O
   (b) 5040 ways. O
   (c) 5760 ways. O
   (d) 35280 ways. O

11. In how many different ways can 4 different cars, one of each of the 4 manufacturers, be parked in a parking lane?
   (a) 20 ways O
   (b) 22 ways O
   (c) 24 ways O
   (d) 26 ways O

12. In how many ways 6 customers stand in a queue for depositing cash in bank?
    (a) 680 ways O
    (b) 480 ways O
    (c) 600 ways O
    (d) 720 ways O

13. Examine the nature of the roots for the following equation $16x^2-24x+9=0$.
    (a) Real and unequal O
    (b) Real, Irrational and Equal O
    (c) Real, Rational and Equal O
    (d) Unreal and Imaginary O

14. For what value of c, would the product of roots be zero?
    (a) $a = 1, b = 1, c = 1$ O
    (b) $a = 1, b = 0, c = 1$ O
    (c) $a = 1, b = 1, c = 0$ O
    (d) $a = 1, b = 2, c = 2$ O

15. Form the equation whose roots are 9, – 4:
    (a) $x + 5x – 36 = 0$ O
    (b) $x^2 – 5x – 36 = 0$ O
    (c) $x^2 – 5x + 36 = 0$ O
    (d) $x^2 + 5x + 36 = 0$ O

16. Choose the correct condition for any equation to be Quadratic equation-
    (a) 5 constants and all constants > 0. O
    (b) 5 constants and all constants < 0. O
    (c) 3 constants and a > 0. O
    (d) 3 constants and a ≠ 0. O

17. When are nature of roots real rather than imaginary?
    (a) If Discriminant is negative O
    (b) If Discriminant is less than zero O
    (c) If Discriminant is not a perfect square O
    (d) If Discriminant is more than or equal to zero O

18. Find the monthly profit function if a firm's yearly fixed cost is ₹ 60,000 and yearly production cost is ₹ 120 per piece. Each unit is sold at ₹ 15.
    (a) $\pi = 5x - 5000$ O
    (b) $\pi(x) = 15x - 5000$ O
    (c) $\pi(x) = 20x - 5000$ O
    (d) $\pi(x) = 25x - 5000$ O

19. A manufacturer has a monthly fixed cost of ₹ 1, 00,000 and a production cost of ₹ 50 per unit produced. The product is sold at ₹ 75. Find the cost function and the number of products be sold by the manufacturer to have break even.
    (a) $25x + 50{,}000$; 2000 O
    (b) $50x + 1{,}00{,}000$; 4000 O
    (c) $5x + 1{,}00{,}000$; 3000 O
    (d) $2.5x + 10{,}000$; 5000 O

20. A cement industry has a yearly fixed cost of ₹ 96,000 and a monthly production cost of ₹ 13 per unit produced. The product is sold at ₹ 39 per unit. Find the cost function.
    (a) $13x + 8000$ O
    (b) $13x + 96{,}000$ O
    (c) $39x + 96{,}000$ O
    (d) $39x + 8000$ O

21. Raw data is:
    (a) Information which can be interpreted to take decision O
    (b) Information which can't be put to use directly O
    (c) Information which is not amenable to conversion O
    (d) Information which are useless O

22. There are four person named A, B, C, & D. A is a sales person whereas B, C, D are students. A collected sales figures for his region and B, C, D used these data in order to study sales pattern. Which one of the following is correct?
    (a) B uses secondary data O
    (b) A & B both are using primary data O
    (c) A, B, C, D all are using secondary data O
    (d) B, C, D are using primary data O

23. If two unbiased coins are tossed once, the probability of getting both the heads is?
   (a) 0.25 O
   (b) 0.50 O
   (c) 0.75 O
   (d) 1 O

24. The mean daily salary paid to all employees in a certain company was ₹600. The mean daily salaries paid to the male and female employees were ₹620 and ₹520 respectively. Male to female employees ratio in the company is:
   (a) 3:2; O
   (b) 4:5; O
   (c) 5:7; O
   (d) 4:1; O

25. The sum of the deviations of a certain number of observations measured from 4 is 72 and the sum of the deviations of the observations from 7 is -3. Mean of the observations is:
   (a) 6.88 O
   (b) 25 O
   (c) 3.63 O
   (d) Cannot be ascertained with given data; O

26. The mean of a certain number of items is 42. If one more item 64 is added to the data, the mean becomes 44. The no of items in the original data is:
   (a) 20 O
   (b) 10 O
   (c) 43 O
   (d) 440 O

27. The weighted average from the following observation is ₹46.23.

Price per tonne (₹)	45.60	50.70	7
Tonnes Purchased	135	40	25

Simple average of the observation is?
   (a) ₹46.23 O
   (b) ₹46.26 O
   (c) ₹66.63 O
   (d) ₹46.24 O

28. The sum of the squares of deviations of a set of observations is the minimum when deviations are taken from the
    (a) Geometric Mean; O
    (b) Harmonic Mean; O
    (c) Arithmetic Mean; O
    (d) Mode; O

29. Which one of the following is correct?
    (a) Regression equation predicts maximum probable values of one variable for specified values of other variable O
    (b) Regression equation predicts most likely values of one variable for specified values of other variable O
    (c) Regression equation predicts maxi-min values of one variable for specified values of other variable O
    (d) Regression equation predicts minimum probable values of one variable for specified values of other variable O

30. It is the most suitable average when it is desired to give greater weight to smaller observations and less weight to larger ones. It is
    (a) AM O
    (b) HM O
    (c) GM O
    (d) Median O

31. In IPL Kolkata Knight Riders plays 70% of their games at night (8 O'clock slot) and 30% during the day (4 O clock slot). The team wins 50% of their night games and 90% of their day games. According to today's newspaper they own yesterday. The probability that the game was played at night is:
    (a) 0.4667 O
    (b) 0.5645 O
    (c) 0.35 O
    (d) 0.5 O

32. Consider the following:

Commodity	Base Price (₹)	Current Price (₹)	Weight
A	22	45	8
B	15	15	6
C	80	90	7
D	110	130	3
E	25	30	5

Weighted aggregative index number is

(a) 123.34 O
(b) 156.11 O
(c) 176.52 O
(d) 142.89 O

33. Consider the following:

Commodity	Base Price (₹)	Current Price (₹)	Weight
A	22	45	8
B	15	15	6
C	80	90	7
D	110	130	3
E	25	30	5

Weighted A.M of price relative index number is:

(a) 123.34 O
(b) 128.79 O
(c) 130.92 O
(d) 182.13 O

34. If $r^2 = 0.3$ & $b_{XY} = -1.5$ then b_{YX} is equal to

(a) +1 O
(b) -0.2 O
(c) -1 O
(d) -0.45 O

35. "Sun will disappear from blue sky today forever". With our available information & belief which one of the following value is most appropriate as probability to this event?

(a) 0.2 O
(b) 0.8 O
(c) 1 O
(d) 0 O

36. From the following data the five year moving average against year 5:

Years	1	2	3	4	5	6	7	8	9
Sales (₹)	36	43	43	34	44	54	34	24	14

(a) 40 O
(b) 43.6 O
(c) 34 O
(d) 41.8 O

37. In a bivariate regression analysis, the difference between actual value of dependent variable and the predicted value of the dependent variable is called:
(a) Outlier O
(b) Slope O
(c) Residual O
(d) Scattered point O

38. Because of heavy rain on Sunday average rainfall of a city for the week increased to 0.6 inch from the average rainfall 0.3 inch measured from Monday to Saturday. The rainfall on Sunday was-
(a) 2.4 inch; O
(b) 0.3 inch; O
(c) 2.1 inch; O
(d) 1.5 inch O

39. In general probability is:
(a) A numerical value between 0 and 1, exclusive, describing the absolute possibility an event will occur O
(b) A numerical value between 0 and 1, inclusive, describing the absolute possibility an event will occur O
(c) A numerical value between 0 and 1, exclusive, describing the relative possibility an event will occur O
(d) A numerical value between 0 and 1, inclusive, describing the relative possibility an event will occur O

40. In a bivariate regression analysis for dependent variable if d = *Actual value – Predicted value* then at different values of independent variable:
(a) Best fit curve occurs when $d_1^2 + d_2^2 + \ldots\ \ldots\ \ldots + d_n^2$ is minimum O
(b) Best fit curve occurs when $d_1^2 + d_2^2 + \ldots\ \ldots\ \ldots + d_n^2$ is maximum O
(c) Best fit curve occurs when $d_1^2 + d_2^2 + \ldots\ \ldots\ \ldots + d_n^2$ is zero O

(d) Best fit curve occurs when $d_1^2 + d_2^2 + \ldots\ \ldots\ \ldots + d_n^2$ is one O

41. For an event Odds in favour are "five to two" This means that:
(a) In a total of seven trials the event will occur five times O
(b) In a total of seven trials the event will occur two times O
(c) In a total of five trials the event will occur two times O
(d) In a total of seven trials the event will not occur five times O

42. $X = 1.36Y - 5.2$ & $Y = 0.61X + 1.51$ are two regression equations. Correlation coefficient between is:
(a) – 0.67 O
(b) – 0.911 O
(c) 0.911 O
(d) 0.67 O

43. With respect to accuracy
(a) Diagrammatic presentation is preferable to Tabular presentation O
(b) Textual presentation is preferable to diagrammatic presentation O
(c) Tabular presentation is preferable to Diagrammatic presentation O
(d) Textual presentation is preferable to Tabular presentation O

44. From the following find the Fisher's Quantity index:

Item	Base Year (₹)		Current Year (₹)	
	Unit Price	Quantity	Unit Price	Quantity
A	8	6	12	5
B	10	5	11	6
C	17	8	8	5

(a) 32.76 O
(b) 72.34 O
(c) 78.12 O
(d) 12.74 O

45. Probability theory is often referred to as
(a) Science of prediction O
(b) Science of uncertainty O
(c) Science of chance O
(d) Science of decision making O

46. In a bivariate analysis if two regression equations are $mx - y + 10 = 0$ & $-2x + 5y = 14$. If coefficient of correlation between x & y is $1/\sqrt{10}$, then value of m is:
   (a) 10 O
   (b) 5/2 O
   (c) 4 O
   (d) 1 O

47. The probability of two events A and B are 0.05 and 0.95 respectively. We can infer that
   (a) Event A is more probable to happen O
   (b) Event B is more improbable to happen O
   (c) Event B is more probable to happen O
   (d) Event A & B are sure to happen O

48. From the following find the Simple average (GM) of Relative Quantity index:

Item	Base Year Quantity	Current Year Quantity
A	8	12
B	10	11
C	15	10

   (a) 100.23 O
   (b) 111.45 O
   (c) 190.15 O
   (d) 103.23 O

49. Consider the following results $N = 12$, $\Sigma dx = 0$, $\Sigma dy = 4$, $\Sigma dx^2 = 1344$, $\Sigma dy^2 = 215$, $\Sigma dxdy = -4360$ Appropriate regression coefficient is:
   (a) -0.821 O
   (b) 1 O
   (c) 5.67 O
   (d) -3.244 O

50. Classical probability is based on the assumption that
   (a) The outcomes of an experiment are already known O
   (b) The probability of an outcome of an experiment is always 0.5 O
   (c) The probability of all outcomes in an experiment is always 1 O
   (d) The outcomes of an experiment are equally likely O