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

Answer all questions. Each question carries 2 marks.

1. Two numbers are in the ratio 7: 9, if the sum of the numbers is 288, then the smaller number is
   (a) 126   O
   (b) 288   O
   (c) 162   O
   (d) 144   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. 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

4. What sum will amount to ₹5480 in 6 years at 10% p.a. compound interest payable half-yearly?
   (a) ₹ 3,051   O
   (b) ₹ 2,051   O
   (c) ₹ 3,501   O
   (d) ₹ 2,501   O

5. Find the amount and the compound interest of ₹ 9,350 at the rate of 8% p.a. compounded half-yearly for four years.
   (a) ₹ 12,795 and ₹ 3,445   O
   (b) ₹ 12,720 and ₹ 3,370   O
   (c) ₹ 12,758 and ₹ 3,408   O
   (d) ₹ 12,835 and ₹ 3,485   O

6. Accumulated series of deposits as future sum money is classified as –

    (a)   Annuity Fund   O

    (b)   Sinking Fund   O

    (c)   Marginal Fund   O

    (d)   Nominal Fund   O

7.   Find the next 5 terms for the series: 2, -4, 8, -16, 32

    (a)   -64, 128, -256, 512, -1024   O

    (b)   64, -128, 256, -512, 1024   O

    (c)   64, 128, 256, 512, 1024   O

    (d)   -64, -128, -256, -512, -1024   O

8.   For the given series: 66, 71, 76, 81, 86, 91, 96 ….666, 671, 676.
With 'n' terms in the series, what will be the value of 'd' ?

    (a)   -5   O

    (b)   15   O

    (c)   -3   O

    (d)   5   O

9.   If the Last term is 187, First Term is 371, value between two consecutive terms is 8 deducted, find the number of terms in the series.

    (a)   25   O

    (b)   22   O

    (c)   23   O

    (d)   24   O

10.   When a Bike had travelled for 78 km in 3 hours 45 minutes in the evening, how much distance would the Bike travelled in 2 hours?

    (a)   41.60 km   O

    (b)   48.88 km   O

    (c)   52 km   O

    (d)   55 km   O

11.   A Train takes 35 hours to reach Punjab from Kolkata (1940 km) and takes 42 hours to reach Kolkata from Gujarat (2160 km). But it took 25 hours from Punjab to Gujarat (1420 km). How many days it take for a trip from Kolkata-Punjab-Gujarat-Kolkata and what is the distance covered?

    (a)   4 days 6 hours and 5520 km   O

    (b)   3 days 18 hours and 5520 km   O

    (c)   4 days and 2680 km   O

    (d)   5 days and 2680 km   O

12. If Bike covers 165 km in 3 hours and scooty covers 100 km in 2 hours, in order to cover 1025 km, how much time would be required by bike and scooty?
    (a)   12.42 hours and 12.42 hours   O
    (b)   21.50 hours and 19.63 hours   O
    (c)   19.52 hours and 19.52 hours   O
    (d)   18.63 hours and 20.50 hours   O

13. With 5% increase in Distance and 2.50% increase in Time, what would be the impact on Speed?
    (a)   Decrease by 2.44%   O
    (b)   Increase by 2.44%   O
    (c)   Increase by 2.38%   O
    (d)   Decrease by 2.38%   O

14. The distance between two terminal stations of Metro is 240 km. A metro rail takes 2 hours to cover the distance. Calculate the total distance covered in 5 days, if 10 trips to and fro takes place between the two stations in a day?
    (a)   6,000 km   O
    (b)   12,000 km   O
    (c)   24,000 km   O
    (d)   18,000 km   O

15. y is the yardstick to measure the performance of two vehicles, where y = Speed × Time × Distance. If Distance travelled by one of the vehicle (2nd Vehicle) is increased by 2%, what would be the impact on the yardstick?
    (a)   1st Vehicle would travel 4% more distance   O
    (b)   2nd Vehicle would travel 4% more distance   O
    (c)   No change in the distance travelled by any of the vehicle   O
    (d)   None of the above   O

16. If Set A = {Q, W, E, R, T, Y} and Set B = {B, G, R, E, O, K}, find (A-B).
    (a)   Set (A-B) = {Q, W, T, Y}   O
    (b)   Set (A-B) = { B, G, O, K}   O
    (c)   Set (A-B) = { E, R}   O
    (d)   None of the Above   O

17. If Set A={8, 9, 7, 5, 6, 2} and Set B = { 1, 4, 9, 3, 8, 2}, find the union of B and A.

    (a)   Set (B U A) = { 8, 9, 7, 5, 6, 2, 1, 4, 9, 3, 8, 2 }   O

    (b)   Set (B U A) = { 8, 9, 2 }   O

    (c)   Set (B U A) = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }   O

    (d)   None of the Above   O

18. In Venn diagram, Universal Set is represented by   .

    (a)   Stars   O

    (b)   Squares   O

    (c)   Rectangle   O

    (d)   Circles   O

19. Find the value of: 39×33

    (a)   312   O

    (b)   531441   O

    (c) 19683×27 O

    (d)   All of the above   O

20. Find the value of $11^{78}/11^{81}$?

    (a) 11^3 O

    (b) $1 / 11^3$ O

    (c)   1331   O

    (d) -1331 O

21. Find the value of $6^3 \times 6^{-2} \times 6^{-5} \times 6^4$

    (a)   0   O

    (b)   1   O

    (c)   6   O

    (d)   216   O

22. 36.   When $a^x = b^y = c^z$ and $b^2 = ac$ then $1/x$, $1/y$, $1/z$ should be in ———

    (a)   G.P   O

    (b)   A.P   O

    (c)   H.P   O

    (d)   None of the above   O

23. Express $\log^9 1 = 0$ in exponential form
    (a) $9^1 = 0$ O
    (b) $9^0 = 1$ O
    (c) $1^9 = 1$ O
    (d) $0^9 = 0$ O

24. If $\log_y 32 = 10$, then which of the following is the value of y ?
    (a) 4   O
    (b) 2   O
    (c) $\sqrt{4}$ O
    (d) $\sqrt{2}$ O

25. If $\log (7y - 5) = 2$, find the value of y.
    (a) 15   O
    (b) 10   O
    (c) 08   O
    (d) 07   O

26. Find the value of v, if $(v -1)! \times 20 = (v + 1)!$
    (a) 0   O
    (b) 2   O
    (c) 4   O
    (d) 5   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. When 9 local trains are running between Haldia and Burdwan. In how many ways can a passenger travel from Burdwan to Haldia and return by a different train?
    (a) 74 ways   O
    (b) 70 ways   O

    (c)   64 ways   O

    (d)   60 ways   O

29. Find the number of permutations for 15 scooters if 3 scooters are to be considered at a time.

    (a)   2730   O

    (b)   2370   O

    (c)   2184   O

    (d)   2814   O

30. How many ways can 5 drivers refill their tanks from 5 refills, assuming no refills in the fuel station remain unused?

    (a)   24 ways   O

    (b)   120 ways   O

    (c)   5 ways   O

    (d)   60 ways   O

31. Examine the nature of the roots for the following equation $16x^2 - 24x + 9 = 0$

    (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. For what values of a and c, value of sum of the roots would be equal to b.
(a) $a = 1, c = n$ O
(b) $a = -1, c = n$ O
(c) $a = n, c = -1$ O
(d) $a = n, c = 1$ O

35. 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

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 certain factory a unit of work is completed by A in 4 minutes, by B in 5 minutes, by C in 6 minutes, by D in 10 minutes, and by E in 12 minutes. Average number of units of work completed per minute is
(a) 25/4   O
(b) 5/48   O

    (c)   4/25   O

    (d)   25/48   O

38. Which one of the following is a feature of Harmonic Mean (HM)?

    (a)   GM is affected much by the presence of externally small or large O observations;

    (b)   GM gives the actual value of the series;   O

    (c)   GM is useful when a given phenomenon has a limit for lower value;   O

    (d)   GM is imaginary if any of the observations is zero;   O

39. If b_{XY} and b_{YX} are regression coefficients of series X on series Y and regression coefficients of series Y on series X respectively then which one of the following is correct?

    (a) $b_{XY} \times b_{YX} = r$, where r is the correlation coefficient   O

    (b) $b_{XY} \times b_{YX} = r^2$, where r is the correlation coefficient   O

    (c) $b_{XY} \times b_{YX} = -r$, where r is the correlation coefficient   O

    (d) $b_{XY} \times b_{YX} = 1/r$, where r is the correlation coefficient   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 $d_1^2 + d_2^2 + ... + d_n^2$ is minimum   O

    (b)   Best fit curve occurs when $d_1^2 + d_2^2 + ... + d_n^2$ is maximum   O

    (c)   Best fit curve occurs when $d_1^2 + d_2^2 + ... + d_n^2$ is zero   O

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

41. In a bivariate analysis if two regression equations are 8x – 10y + 66 = 0 & 40x – 18y – 214 = 0. Then x ,y , the mean of the series x & y care respectively

    (a)   13, 17   O

    (b)   17, 17   O

    (c)   5/4, 20/9.   O

    (d)   8, 18   O

42. A lot contains 10 items of which 3 are defective. Three items are chosen from the lot at random one after another without replacement. The probability that all the three are defective is

    (a)   0.008   O

    (b)   0.992   O

    (c)   0.067   O

(d) 0.05   O

43. When two events happen simultaneously which of the following is true?

(a) The outcome of the first event always have an effect on the outcome of   O
the second event

(b) The outcome of the first event may or may not have an effect on the   O
outcome of the second event

(c) The outcome of the first event does not not have any effect on the outcome   O
of the second event

(d) The outcome of the first event have always a 50% effect on the outcome   O
of the second event

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. If an unbiased coin is tossed once, then the two events head and tall are

(a) Mutually exclusive   O
(b) Exhaustive   O
(c) Equally likely   O
(d) All these   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. A bag contains 10 red and 10 green balls. A ball is drawn from it. The probability that it will be green is
    (a) 1/10   O
    (b) 1/3   O
    (c) 1/2   O
    (d) None of these   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. $y = (4x - 3)^3 + (5x - 2)^2$. Calculate y_1
    (a) $182x^2 + 13x + 29$ O
    (b) $96x^2 + 13x + 29$ O
    (c) $12x^2 + 26x + 29$ O
    (d) $192x^2 + 26x + 58$ O

50. 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