

Total Number of Questions : 48

Time : 3.00 Hours

Max. Marks : 200

1. Find the digit in the unit place of 2^{83} . (3 Marks)
2. Examine whether $x = 3$ is a zero of the polynomial $x^3 - 4x^2 + x + 6$ or not. (3 Marks)
3. Find an equation whose roots are the reciprocals of the roots of the equation $x^2 + x - 2 = 0$. (3 Marks)
4. If $2x + my = 8$ and $nx - 3y = 5$ have infinite number of solutions, find the values of 'm' and 'n'. (3 Marks)
5. Find the square root of the number $15 \times 27 \times 125$. (3 Marks)
6. In a flower bed, there are 28 rose plants in the first row, 25 in the second, 22 in the third and so on. If there is only one plant in the last row, how many rows are there in the flower bed? (3 Marks)
7. The price of a book is 320. The shopkeeper first increases the price by 10% and then gives a discount of 10%. Then what is the new price of the book? (3 Marks)
8. If $5x + 3 : 4y + 2 = 3 : 2$, what is the ratio of $x : y$? (3 Marks)
9. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. Calculate the % error in this process. (3 Marks)
10. Evaluate the difference between simple interest and compound interest for an amount of Rs. 10,000/- for 2 years at the rate of 5%. (3 Marks)
11. Arithmetic mean of 10 values in a data is obtained as 75. But later it is found that the value 64 is wrongly taken as 46. Find the correct arithmetic mean. (3 Marks)
12. A man invests in a 16% stock at Rs. 128. What is the % of interest obtained by him? (3 Marks)
13. From an outside point Q, the length of a tangent to a circle is 24 cm and the distance of Q from the centre of the circle is 25 cm. Find the radius of the circle. (3 Marks)
14. In $\triangle ABC$, $AB = 4$ cm, $BC = 6$ cm and $\angle B = \angle C$. Calculate the perimeter of the triangle. (3 Marks)
15. Two cubes each of side 4 cm are joined end to end. Find the surface area of the resulting cuboid. (3 Marks)
16. In two congruent triangles $\triangle DEF$ and $\triangle PQR$, right angled at E and Q, respectively, $DE = 12$ cm and $QR = 5$ cm. What is the value of DF? (3 Marks)
17. If $\sin\theta = \frac{1}{2}$, find the value of $\tan\theta$. (3 Marks)
18. Find the point Q which divides the line segment joining the points P(2, 3) and R(1, -1) in the ratio 1 : 3 internally. (3 Marks)
19. If Lily takes 2 hrs for a journey from A to B at a speed of 50 km/hr and 3 hrs from B to C at a speed of 60 km/hr. What is the average speed of her journey? (3 Marks)
20. If $A = \{a, b, d, f, h\}$ and $B = \{a, c, d, e, f, g\}$, find $(A - B) \cup (B - A)$. (3 Marks)
21. Express 0.2373737... as a rational number. (5 Marks)
22. Find the values of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$ (5 Marks)
23. If the polynomial $4x^3 + 6x^2 + k$ is divided by $2x + 5$, the remainder is 3. Find the value of k. (5 Marks)

24. Find out two consecutive positive integers whose sum of squares is 265. (5 Marks)
25. Sum of twice 'a' and 'b' is 8; sum of 'a' and twice 'b' is 6. What are the values of 'a' and 'b'? (5 Marks)
26. Simplify $\frac{(57 \times 57 + 2 \times 57 \times 43 + 43 \times 43)(57 \times 57 - 43 \times 43)}{(57 \times 57 \times 57 + 3 \times 57 \times 57 \times 43 + 3 \times 57 \times 43 \times 43 + 43 \times 43 \times 43)}$. (5 Marks)
27. Find the sum of all numbers from 500 to 1000 which are divisible by 7. (5 Marks)
28. If selling price of an object is doubled, then profit triples. What is the percentage of profit? (5 Marks)
29. The profit earned by selling an article for Rs. 968 is equal to the loss incurred when the same article is sold for Rs. 712. What should be the selling price for making 30% profit? (5 Marks)
30. The ratio of the incomes of A and B is 3 : 4 and ratio of their expenditures is 5 : 7. If each of them saves Rs. 1,000, find the incomes of both. (5 Marks)
31. A man saves 20% of his monthly salary. In April, his expenditure increased by 15% of his usual expenditure and he is able to save only Rs. 400. What is his monthly salary? (5 Marks)
32. In an examination, 40% of maximum marks is required to be passed. A student gets 188 marks and declared to be failed by 32 marks. What is the maximum marks? (5 Marks)
33. Calculate the least number of complete years required for a sum of money to become more than its double, when it is deposited in a bank offering 20% compound interest. (5 Marks)
34. The population in a city increases by 3% every year. If it has a population of 5,30,450 in 2006, what was it in 2004? (5 Marks)
35. From the frequency distribution table given below, prepare a 'less than' frequency distribution table. (5 Marks)
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|-----------|---|--------|---------|---------|---------|---------|---------|---------|---------|
| Class | : | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | 70 - 80 |
| Frequency | : | 5 | 3 | 4 | 3 | 3 | 4 | 2 | 2 |
36. Find the arithmetic mean from the following data indicating marks of 40 students in a test paper having maximum of 20 marks. (5 Marks)
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|-----------|---|-------|-------|--------|---------|---------|
| Class | : | 0 - 4 | 4 - 8 | 8 - 12 | 12 - 16 | 16 - 20 |
| Frequency | : | 3 | 8 | 12 | 10 | 7 |
37. Mathew invested 67,200/- in Rs. 100/- shares which are quoted as Rs. 120/-. Calculate the income if 15% dividend is declared in the shares. (5 Marks)
38. If a sector of a circle with internal angle 30° has area $12\pi \text{ cm}^2$, find the perimeter of that circle as a multiple of π . (5 Marks)
39. ABCD is a cyclic quadrilateral, where AB is the diameter of the circle. If $\angle ADC = 120^\circ$, what is the measure of $\angle CAB$? (5 Marks)
40. In a trapezium PQRS, PQ and RS are the parallel sides. If PQ = 16 cm, QR = 15 cm, RS = 25 cm and $\angle S = 90^\circ$, calculate the area of the trapezium. (5 Marks)
41. ABCD is a parallelogram where $\angle D = 150^\circ$. Find the length of the side BC if its area is 117 cm^2 and AB = 18 cm. (5 Marks)

42. A cylinder of 32 cm height and 18 cm base radius is filled with sand. The cylinder is emptied in the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the diameter of the heap. (5 Marks)
43. In $\triangle XYZ$, P and Q are two points on XY and XZ, respectively, such that XP = 3 cm and XQ = 5 cm. If PY = 6 cm and YZ = 18 cm, what is the length of PQ? Also find QZ. (5 Marks)
44. From the top of a tower of 30 m height, a man is watching the base of a tree at an angle of depression measuring 30° . Evaluate the distance between the tree and the tower. (5 Marks)
45. If the points D(1, 1), E(3, 5) and F(2, K) are collinear, find the value of K. (5 Marks)
46. Travelling at $\frac{4}{5}$ of the original speed, a train is 25 minutes late. Find the usual time taken by the train to complete the journey. (5 Marks)
47. The time taken by A to finish a piece of work is twice the time taken by B and thrice the time taken by C. If all the three work together, it will be completed in 2 days. How many days does B alone require to complete that work? (5 Marks)
48. In a group of 60 people, 45 like to play cricket, 38 like to play football and 8 like to play neither cricket nor football. How many of them like to play both cricket and football? (5 Marks)
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