Exercise – 1
(Simple Equations)

Directions for questions 1 to 50: For the Multiple Choice Questions, select the correct alternative from the given choices. For the Non-Multiple Choice Questions, write your answer in the box provided.

1. (a) If $x + \frac{x}{2} + \frac{x}{3} + 4 = 26$ then x = ☐

(b) If $\frac{4x}{5} + \frac{3x}{10} + ab = a(b+1) + \frac{6a}{5}$, x = _____.

(A) $\frac{a}{2}$ (B) 2a (C) $\frac{3a}{4}$ (D) $\frac{2a}{11}$

2. Solve the following pair of equations for x and y respectively.
5x – 4y – 5 = 0 and 3x – 5y + 10 =0
(A) 3, 4 (B) 5, 5 (C) 4, 3 (D) 6, 4

3. Find the respective values of x, y and z satisfying the following equations.
4x + y – 4z = 10; x + y – z = 4; 5x – y + 3z = 16.
(A) 1, 2, 3 (B) 3, 2, 1 (C) 3, 1, 2 (D) 1, 3, 2

4. The cost of eight bananas and nine guavas is ₹43. The cost of five bananas and seven guavas is ₹31. The cost of three bananas and two guava is ₹ ☐.

5. The sum of the three consecutive integers is 30. The sum of their squares is ☐.

6. When 2 is added to half of one-third of one-fifth of a number, the result is one-fifteenth of the number. The number is ☐.

7. P, Q and R have ₹6,000 among themselves. R has two-thirds of the total amount with P and Q. The amount with R is ☐.

8. Three consecutive odd integers are in increasing order such that the sum of the last two integers is 13 more than the first integer. Find the three integers.
(A) 9, 11, 13 (B) 11, 13, 15
(C) 13, 15, 17 (D) 7, 9, 11

9. There are some rabbits and some peacocks in a park. The total number of their heads is 60 and the total number of their legs is 192. The number of rabbits is ☐.

10. The denominator of a fraction is 1 less than twice the numerator. If the numerator and denominator are both increased by 1, the fraction becomes 3/5. Find the fraction.
(A) $\frac{2}{3}$ (B) $\frac{3}{5}$ (C) $\frac{5}{9}$ (D) $\frac{4}{7}$

11. The sum of the digits of a two-digit number is 17. The tens digit of the number is 1 more than the units digit. The two-digit number is ☐.

12. The sum of the digits of a two-digit number is 12. The difference of the digits is 6. Find the number.
(A) 93 (B) 39
(C) Either (A) or (B) (D) None of these

13. The number formed when a three-digit number X is reversed is 396 more than the original number. If the tens digit of X is 2 and its hundreds digit is half the units digit, find X.
☐

14. When the numerator and the denominator of a fraction are increased by 4 each, the fraction becomes 2/3. When the denominator is decreased by 1, it becomes 3/5. Find the fraction.
(A) $\frac{5}{8}$ (B) $\frac{7}{11}$ (C) $\frac{9}{13}$ (D) $\frac{6}{11}$

15. The age of a man twenty five years hence will be four times his age twenty years ago. The present age of the man is ☐ years.

16. Ten years ago, the age of Anand was one-third the age of Bala at that time. The present age of Bala is 12 years more than the present age of Anand. The present age of Anand (in years) is ☐.

17. The sum of the present ages of P and Q equals the present age of R. k years from now, R's age will be 20 years less than the sum of the ages of P and Q. The value of k is ☐.

18. Amar has an amount of ₹190 in denominations of ₹2 and ₹5, coins. He has 10 more ₹5 coins than ₹2 coins. The number of ₹2 coins he has is ☐.

19. A bag contains a total of 90 coins in the form of 20 paise and 25 paise coins. If the total value of coins in the bag is ₹21, the number of 25 paise coins in the bag is ☐.

20. ₹1200 is divided among P, Q and R. P gets half of the total amount received by Q and R. Q gets one-third of the total amount received by P and R. The amount received by R is ₹ ☐.

21. In a fraction, the numerator is 5 more than the denominator and thrice the numerator is 21 more than the denominator. Find the fraction.
(A) $\frac{8}{3}$ (B) $\frac{9}{4}$ (C) $\frac{12}{7}$ (D) $\frac{14}{9}$

22. The tens digit of a two-digit number is two more than its units digit. The two-digit number is 7 times the sum of the digits. The units digit is ☐.

23. The cost of two chairs and three tables is ₹1,300. The cost of three chairs and two tables is ₹1,200. The cost of each table is more than that of each chair by _____.
(A) ₹100 (B) ₹75 (C) ₹50 (D) ₹60

24. Nine times the tens digit of a two-digit number when added to eight times the units digit is equal to the two-digit number. The number is ☐ .

25. The total cost of one chair and one table is ₹500. The total cost of two chairs and three tables is ₹1,300. The cost of one table is ₹ ☐ .

26. The sum of the ages of A and B is four-thirds the age of C. The age of B is two-thirds the age of C. If the sum of the ages of the three persons is 35 years the age of B is _____.
(A) 20 years (B) 10 years
(C) 18 years (D) 15 years

27. The present ages of a woman and her daughter are 25 and 5 years respectively. After x years the age of the woman would be twice the age of the daughter. Find the age of the daughter at that time.
(A) 28 years (B) 22 years
(C) 25 years (D) 20 years

28. In 5 hours A walks 2 km less than the distance B walks in 9 hours. In four hours A walks 11 km more than that covered by B in three hours. The distance that A can walk in 2 hours is ☐ .

29. The cost of three pens, four erasers and ten sharpeners is ₹75. The cost of six pens, seven erasers and twenty sharpeners is ₹146. Find the cost of each eraser.
(A) ₹3 (B) ₹4 (C) ₹5 (D) ₹6

30. Ajay and Vijay have some marbles with them. Ajay told Vijay "if you give me x marbles, both of us will have equal number of marbles". Vijay then told Ajay "if you give me twice as many marbles, I will have 30 more marbles than you would". Find x.
(A) 4 (B) 5 (C) 6 (D) 8

31. The number of solutions of the system of linear equations $5x + 7y = 3$ and $15x + 21y = 24$ is _____.
(A) 0 (B) 1 (C) 2 (D) ∞

32. A man travelled a total distance of 1800 km by plane, train and bus. He travelled one-third of the whole trip by plane and the distance travelled by train is three-fifth of the distance travelled by bus. Find the distance travelled by bus.
(A) 450 km (B) 850 km
(C) 1200 km (D) 750 km

33. Twenty five years ago, the age of Mohan was 7/3 times the age of Sohan. If the present age of Sohan is 40 years, find the present age of Mohan (in years).
(A) 60 (B) 50 (C) 35 (D) 65

34. P, Q and R are integers satisfying the equations $P + Q = 12$, $Q + R = 18$ and $P + R = 24$. Find their product.
(A) 567 (B) 405 (C) 243 (D) 390

35. The sum of the digits of a two-digit number is 4 more than the excess of the units digit over the tens digit. If the product of the digits is 16, find the number.
(A) 82 (B) 28
(C) 44 (D) Either (A) or (B)

36. A three-digit number is 9 more than ten times the sum of its digits, if the hundreds digit is 1, the units digit is ☐.

37. Among four consecutive odd numbers the sum of the squares of the first two numbers is 64 less than the sum of the squares of the next two numbers. Find the four numbers.
(A) 7, 9, 11, 13 (B) 3, 5, 7, 9
(C) 5, 7, 9, 11 (D) 1, 3, 5, 7

38. The tens digit of a three-digit number is twice the units digit. The hundreds digit of the number is twice the tens digit. The number formed by reversing the digits of the number is 594 less than it. The number is ☐ .

39. A two-digit number is four times the sum of its digits. How many numbers satisfy the condition?
(A) 5 (B) 7
(C) 6 (D) 4

40. In a three-digit number, the hundreds digit is 2 more than the tens digit and the units digit is 2 less than the tens digit. If the sum of the digits is 18, the number is ☐ .

41. Three times the numerator of a fraction is three more than the denominator. The fraction formed when the denominator is increased by 3 is $\frac{1}{3}$. Find the fraction.
(A) $\frac{4}{9}$ (B) $\frac{5}{12}$
(C) $\frac{2}{3}$ (D) Cannot be determined

42. At present, the age of a father is five years more than thrice his son's age. Fifteen years hence, the father's age will be twice his son's age at that time. The present age of the son is ☐ years.

43. Ajay bought a total of 12 oranges and 18 bananas for ₹84. When the cost of each orange doubles, he could buy 6 oranges and 16 bananas for ₹80. Find the cost of each banana.
(A) ₹3 (B) ₹2 (C) ₹4 (D) ₹5

44. If $\frac{4x+6}{10x-6} = \frac{2x+9}{5x+5}$, find x.
(A) 2 (B) 3 (C) 4 (D) 1

45. If the sum of two numbers is 20 and the difference between the two numbers is 4, find the numbers.
(A) 14, 6 (B) 11, 9
(C) 13, 7 (D) 12, 8

46. The cost of one pen and two books together is ₹70. The cost of three pens and nine books together is ₹300. Find the difference between the cost of a book and a pen.
(A) ₹30 (B) ₹20
(C) ₹10 (D) None of these

47. A man had three sons and they were born at an interval of five years. The sum of their ages after five years will be sixty years. What was the age of the youngest son five years ago?
(A) 10 years (B) 15 years
(C) 5 years (D) 20 years

48. "I am seven times as old as you were when I was as old as you are", said a man to his son. Find their present ages (in years) if the sum of their ages is 110 years.
(A) 70, 40 (B) 80, 30
(C) 75, 45 (D) 65, 45

49. If $\frac{1}{p}=\frac{x}{y+z}, \frac{1}{q}=\frac{y}{x+z}; \frac{1}{r}=\frac{z}{x+y}$, and $x + y + z \neq 0$, then $\frac{1}{p+1}+\frac{1}{q+1}+\frac{1}{r+1}$ is _____.
(A) 1 (B) 2 (C) 3 (D) 0

50. If a and x are real numbers satisfying $a^{x-1} = a^{2x+1}$, find x.
(A) 1 (B) 2
(C) –1 (D) Cannot be determined

Exercise – 2
(Ratio, Proportion and Variation)

Directions for questions 1 to 50: For the Multiple Choice Questions, select the correct alternative from the given choices. For the Non-Multiple Choice Questions, write your answer in the box provided.

1. If a : b = 4 : 3, then $\frac{\left(\frac{a}{b}+\frac{b}{a}\right)}{5\left(\frac{a}{b}-\frac{b}{a}\right)}$ is _____.
(A) $\frac{5}{7}$ (B) $\frac{7}{5}$ (C) $\frac{5}{12}$ (D) $\frac{7}{25}$

2. If a : b = 5:4, find $\frac{(2a+3b)(3a-2b)}{a^2+b^2}$.
(A) $\frac{154}{41}$ (B) $\frac{148}{41}$
(C) $\frac{144}{37}$ (D) Cannot be determined

3. If a : b = 4 : 5 and b : c = 3 : 5, then find a : b : c.
(A) 12 : 9 : 25 (B) 15 : 9 : 10
(C) 12 : 15 : 25 (D) 15 : 9 : 25

4. Find
(a) Duplicate ratio of 25 : 4.
(A) 5 : 2 (B) 125 : 8
(C) 625 : 16 (D) 25 : 4

(b) Triplicate ratio of 8 : 11.
(A) 64 : 121 (B) 512 : 1331
(C) 8 : 11 (D) $\sqrt[3]{8} : \sqrt[3]{11}$

(c) Sub-duplicate ratio of 9 : 16.
(A) 81 : 256 (B) 27 : 64
(C) 9 : 16 (D) 3 : 4

(d) Sub triplicate ratio of 343 : 729.
(A) 343 : 729 (B) 7 : 9
(C) 49 : 81 (D) $\sqrt{343}$: 27

5. The mean proportional of
(a) 6 and 24 is ☐
(b) 50 and 512 is ☐

6. If a : b = 2 : 3 and b : c = 4 : 1, then find a : c.
(A) 8 : 3 (B) 8 : 5 (C) 8 : 1 (D) 3 : 4

7. If three numbers are in the ratio 1 : 3 : 5 and their sum is 108, then the largest number is ☐.

8. The ratio of the ages of Arun, Brahma and Chari is 5 : 4 : 3. If Brahma's age is 28 years, then the sum of the ages of the three persons is ☐.

9. There are two positive numbers in the ratio 5 : 8. If the larger number exceeds the smaller by 15, the smaller number is ☐.

10. The total number of boys and girls in a class is 70. Which of the following cannot represent the ratio of the boys and girls in the class?
(A) 1 : 4 (B) 4 : 3 (C) 1 : 6 (D) 1 : 3

11. Find p : t, if p : q = 1 : 2, q : r = 2 : 3, r : s = 3 : 4 and s : t = 4 : 5.
(A) 1 : 3 (B) 1 : 4 (C) 1 : 5 (D) 3 : 10

12. An amount of ₹1560 was divided among A, B and C, in the ratio $\frac{1}{2}:\frac{1}{3}:\frac{1}{4}$. The share of C is ☐.

13. The ratio of two natural numbers is 5 : 6. If a number is added to both the numbers, the ratio becomes 7 : 8. If the larger number exceeds the smaller number by 10 the number added is ☐.

14. The ratio of the present ages of a father and a daughter is 3 : 1. After 12 years, the ratio of their ages would be 11 : 5. Find the present age of the father.
(A) 68 years (B) 64 years
(C) 58 years (D) 54 years

15. If a : b = 2 : 1, b : c = 3 : 5, c : d = 4 : 5 and e : d is 6 : 5, then find a : b : c : d : e.
(A) 24 : 12 : 10 : 25 : 30 (B) 24 : 12 : 20 : 25 : 30
(C) 24 : 12 : 10 : 5 : 6 (D) 24 : 12 : 10 : 25 : 6

16. The ratio of the incomes of Chetan and Dinesh is 3 : 4. The ratio of their expenditures is 5 : 7. If both save ₹2,000, find the incomes of both.
(A) ₹12,000, ₹16,000 (B) ₹6,000, ₹8,000
(C) ₹9,000, ₹12,000 (D) ₹18,000, ₹24,000

17. Amar and Bhuvan have the ratio of their monthly incomes as 6 : 5. The ratio of their monthly expenditures is 3 : 2. If Bhuvan saves one-fourth of his income, find the ratio of their monthly savings.
(A) 3 : 5 (B) 3 : 10 (C) 3 : 8 (D) 1 : 2

18. A person distributed ₹20,000 among three persons A, B and C. If A gets thrice as much as C and B gets twice as much as C, then find the ratio in which the money is distributed.
(A) 1 : 2 : 3 (B) 2 : 1 : 3
(C) 3 : 2 : 1 (D) 1 : 2 : 1

19. The number of men and women in a conference hall are in the ratio 5 : 4. If three men and six women join the conference then the number of men and women in the conference hall will be in the ratio 7 : 6. Find the original number of men and women in the conference hall.
(A) 48, 60 (B) 60, 48 (C) 30, 24 (D) 40, 32

20. What number should be added to the terms in the ratio 2 : 5 such that the ratio of the terms would become 1 : 2 and the sum of terms would become 36?
(A) 2 (B) 3 (C) 4 (D) 5

21. The sum of five times the first number and two times the second number is equal to twice the difference of thrice the first number and twice the second. Find the ratio of the two numbers.
(A) 1 : 6 (B) 6 : 1
(C) 2 : 11 (D) Either (B) or (C)

22. Srinivas's basic salary and allowances are in the ratio 5 : 4. There is an increase of 40% in his basic salary and his allowances go up by 60%. What is the ratio of his basic salary and allowances now?
(A) 31 : 32 (B) 32 : 35 (C) 35 : 32 (D) 32 : 31

23. If a : b = 1 : 2 ; b : c = 4 : 3; c : d = 4 : 5 and e is 50% more than d, find the ratio between a and e.
(A) 16 : 45 (B) 12 : 23 (C) 23 : 12 (D) 18 : 29

24. The value of diamond varies with the square of its weight. A ₹14,40,000 worth diamond breaks into three pieces whose weights are in the ratio 3 : 4 : 5. The loss in its value due to breakage (in ₹ lakhs) is ☐ .

25. A hostel of 1000 men is provisioned for 8 weeks at the rate of 10 kg per week per man. If there had been fewer men, the provisions would have lasted 2 more weeks at the rate of 16 kg per week per man. The difference in the number of men in the above two cases is ☐ .

26. Calculate the fourth proportional to the numbers 0.8, 1.6 and 1.6.
(A) 32.4 (B) 2.34 (C) 3.2 (D) 25.6

27. Find a fraction which bears the same ratio to $\frac{1}{57}$ as $\frac{3}{7}$ does to $\frac{5}{19}$.
(A) $\frac{1}{27}$ (B) $\frac{3}{11}$ (C) $\frac{5}{9}$ (D) $\frac{1}{35}$

28. The ratio of two numbers is 5 : 8. If each number is increased by ten, the ratio becomes 7 : 10. Find the numbers.
(A) 25, 50 (B) 35, 40 (C) 40, 50 (D) 25, 40

29. A port had provisions for 150 men for 45 days. After ten days 25 men left the port. How long will the food last at the same rate for the remaining men?
(A) 40 days (B) 28 days
(C) 50 days (D) 42 days

30. There are three positive numbers in the ratio 6 : 7 : 8. If the sum of the squares of the smallest and the largest numbers is 1600, find the numbers.
(A) 6, 7, 8 (B) 12, 14, 16
(C) 18, 21, 24 (D) 24, 28, 32

31. In a class of 70 students, the ratio of the number of boys and girls is 4 : 3. Among the girls, the ratio of the number of sports persons to non-sports persons is 1 : 4. If the ratio of the number of sports persons to non-sports persons in the class is 8 : 27, find the ratio of the number of sports persons to non-sports persons among the boys in the class.
(A) 1 : 2 (B) 1 : 3 (C) 1 : 4 (D) 2 : 3

32. The area of a disk varies as the square of its radius. The area of a circle is 154 sq units, when the radius is 7 units. The area of a circle in sq. units when the radius is 3.5 units is ☐ .

33. P varies directly with the square of Q when R is constant and inversely with R when Q is constant. When Q = 12 and R = 8, then P = 36. The value of P when Q = 24 and R = 16 is ☐ .

34. An article worth ₹6400 is broken into two pieces whose weights are in the ratio 3 : 5. If the value of the article is proportional to the square of its weight, The loss incurred because of the breakage is ☐ rupees.

35. If 60 men do a piece of work in 27 days, then in how many days can 18 men do the same work?
(A) 120 days (B) 90 days
(C) 100 days (D) 60 days

36. A father divides his property such that the eldest son gets double the second and thrice the third. If his eldest son gets ₹12,000 more than the youngest. The share of the second son is ☐ rupees.

37. If $(3a^2 + 2b^2)/(2b^2 - a^2) = 15/7$, then what could be the value of a : b?
(A) 3 (B) 2/3 (C) 3/2 (D) 1/3

38. Three times a number is equal to two times the other number. Find the ratio of 3 times the sum and 5 times the difference of the two numbers.
(A) 2 (B) 4 (C) 1 (D) 3

39. The sum of three times a number and two times the other is two times the difference of thrice the first number and twice the second. If the first number is greater than the second, then find the ratio of the two numbers.
(A) 1 : 3 (B) 2 : 1 (C) 3 : 2 (D) 2 : 3

40. Three numbers are in the ratio of 3 : 5 : 9. Find the largest number, given the sum of the squares of the numbers is 460.
(A) 10 (B) 9 (C) 6 (D) 18

41. Three numbers are in the ratio of 2 : 3 : 5. Given that the product of the extremes is 90. The difference between the largest and the smallest of them is ☐.

42. A purse contains 50 paise, 25 paise and one-rupee coins in the ratio of 5 : 2 : 5. The number of 50 paise coins, when the difference between the total value of 25 paise and 50 paise coins is ₹8 is ☐.

43. A man has 50 paise, 1 rupee and 5 rupee coins in the ratio of 2 : 2 : 1. The total amount he has, given that the difference in the total value of 5 rupee and 1 rupee coins is ₹15 is ☐.

44. X varies directly as the square of Y. For Y = 6, X = 72. The value of X for Y = 9 is ☐.

45. X varies directly with Y and inversely with the square of Z. For X = 2, Y = 3, the value of Z is 8. The value of X, for Y = 6 and Z = 2 is ☐.

46. The area of a circle varies as the square of its radius. Given that the area of a circle is 196 sq.ft for a radius of 7 ft, then the area (in sq.ft) of a circle whose radius is 8 ft is ☐.

47. X varies directly as the cube root of Y. Given X is 12, when Y is 8. Find X, when Y is 27.
(A) 15 (B) 729
(C) 18 (D) 6

48. The force of attraction between two objects varies directly with the product of their masses and inversely with the square of the distance between them. When the product of the masses (taken in kg) of two objects is 12 and the distance between them is 2 m, the force of attraction between them is 18 Newtons. The force of attraction between two bodies whose product of masses (taken in kg) is 18 and separated by a distance of 3 m is ☐ Newtons.

49. Price varies directly as demand and inversely as the square root of supply. For demand = 1000 and supply = 100, price = 500. Find the price, if demand = 3000 and supply = 900.
(A) 100 (B) 150
(C) 500 (D) 250

50. A father divides his property among his three sons such that the eldest son's share is twice the second son's share and the share of the second son is thrice the third son's share. If the second son gets ₹4,000 more than the third, the value of the total property is ₹ ☐.

Exercise – 3
(Percentages, Profit & Loss, Partnerships)

Directions for questions 1 to 75: For the Multiple Choice Questions, select the correct alternative from the given choices. For the Non-Multiple Choice Questions, write your answer in the box provided.

1. 64 is what percent of 80?
(A) 80% (B) 70% (C) 60% (D) 64%

2. The fractional value of $14^{2}/_{7}\%$ is _____.
(A) $\frac{2}{7}$ (B) $\frac{1}{7}$ (C) $\frac{3}{7}$ (D) $\frac{5}{7}$

3. If g% of b + 1% of gb = 4% of (g + b), then the sum of reciprocals of g and b is _____.
(A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{1}{5}$

4. The price of an article is increased by 20%. Later the new price is decreased by 20%. If the latest price is ₹1,440, then the original price is ☐ rupees.

5. $\frac{3}{20}$ is what percent of $\frac{12}{25}$?
(A) 42.75% (B) 31.25% (C) 35.5% (D) 40.5%

6. If 72% of a particular number is 468, then 80% of the same number is ☐.

7. There is a 30% increase in the price of an article in the first year, a 20% decrease in the second year and a 10% increase in the next year. If the present price of the article is ₹2,288, then the price of the article 3 years ago is ☐ rupees.

8. If a number is increased by 45%, then it becomes 116 then the number is ☐.

9. The ratio of three quantities X, Y and Z is $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$.
By what percent is (X + Z) more than Y?
(A) 75 (B) 100 (C) 125 (D) 50

10. If the length and breadth of a rectangle are increased by 10%, then by what percent will the area increase?
(A) 15% (B) 10% (C) 21% (D) 20%

11. If A is 30% more than B and B is 20% less than C, then A is what % more/less than C?
(A) 4% less (B) 6% more
(C) 4% more (D) 6% less

12. The first and second numbers are 25% and 75% respectively of the third number. What percent of the second number is the first?
(A) $24^{3}/_{2}\%$ (B) $16^{2}/_{3}\%$
(C) $33^{1}/_{3}\%$ (D) None of these

13. If 25% of x is 15 less than 15% of 1500, then x is ☐.

14. If A got 80 marks and B got 60 marks, then what percent of A's marks is B's marks?
(A) 60% (B) 80% (C) 65% (D) 75%

15. In the above problem, by how much percent is A's marks more than that of B?
(A) 35% (B) $33^1/_3$% (C) 25% (D) $44^4/_9$%

16. If P's salary is ₹5,000 and Q's salary is ₹6,000, then what percent of P's salary is Q's?
(A) 80% (B) 110% (C) 120% (D) 140%

17. In the previous problem, by what percentage is P's salary less than that of Q?
(A) $16^2/_3$% (B) 30% (C) 25% (D) 20%

18. If P gets 25% more than Q, then Q gets less than P by what percent?
(A) $33^1/_3$% (B) 30% (C) 20% (D) $16^2/_3$%

19. If two positive numbers are in the ratio $\frac{1}{8}:\frac{1}{5}$, then by what percent is the second number more than the first?
(A) 40% (B) $33^1/_3$% (C) 60% (D) $66^2/_3$%

20. A man spends 75% of his income. If he saves ₹2,000, then his income in rupees is [ ] .

21. Two candidates contested in an election. The candidate who got 55% of the votes, won by a majority of 488. The total number of votes polled is [ ] (if no votes are invalid).

22. If 6% of x and 24% of 380 are equal, then x is [ ] .

23. If 40% of k is 40 more than 40% of 40, then k is [ ] .

24. Find the value of 40% of 20 – 80% of 40 + 30% of 10 – 4% of 100.
(A) 25 (B) –26 (C) –25 (D) –27

25. The price of an article falls by 20% and then rises by 27·5%. By what percent is the latest price more than its original price?
(A) 2 (B) 4 (C) 3.5 (D) 3

26. If an article is sold at 19% profit instead of 12% profit, then the profit would be ₹105 more. The cost price of the article is [ ] . (in rupees)

27. If the selling price of an article is ₹81, loss is 10%, then the cost price is [ ] (is ₹).

28. If a trader sold two cars each at ₹3520 and gains 12% on the first and loses 12% on the second, then his profit or loss percent on the whole is
(A) 14.4% loss (B) 14.4% profit
(C) 1.44% loss (D) neither profit nor loss

29. A trader buys two articles at the same price. He sold one article at 20% profit and sold the other at 10% loss. Find his overall profit/loss percentage.
(A) 10% loss (B) 10% profit
(C) 5% loss (D) 5% profit

30. A shopkeeper sold a toothpaste at a profit of 12.5%. His cost price was ₹5 less than his selling price. His cost price (in ₹) is [ ] .

31. Rohit sold his bicycle at 4% profit. If he sold it for ₹204 less, he would have incurred a 30% loss. His cost price (in ₹) is [ ] .

32. The selling price of 12 articles equals the cost price of 15 articles. Find the profit/loss percentage.
(A) 25% profit (B) 20% profit
(C) 25% loss (D) 20% loss

33. If the cost price of 40 articles is equal to the selling price of 50 articles, then the gain or loss percent is
(A) 20% loss (B) 20% profit
(C) 25% profit (D) 25% loss

34. A sold an article to B at 10% profit and B sold it to C at 15% loss. If the difference in the purchasing prices of A and C is ₹58.5, the cost price of B is [ ] (₹).

35. A trader loses 15% if an article is sold for ₹102. Find the selling price of the article to gain 20% is [ ] (₹).

36. Anwar marked his radio at 40% above his cost price. He, then sold it after offering a discount of 40%. If he incurred a loss of ₹640, his selling price (in ₹) is [ ] .

37. A shopkeeper marked a suit at ₹400. He sold it after allowing a discount, and still made a profit of 25%. At what percentage above its cost price did he mark the suit, if he sold it for ₹320?
(A) 50% (B) $66^2/_3$% (C) $62^1/_2$% (D) $56^1/_4$%

38. A merchant claims to sell goods at his cost price. But by using false weights, he gives only 600 gm of goods for every 1 kg that he buys. What is his profit percentage?
(A) 40% (B) 100% (C) 60% (D) $66^2/_3$%

39. Vijay marked his camera at 50% above his cost price. He sold it after allowing a discount and still made a profit of 20%. What is the discount percentage he offered on it?
(A) 20% (B) 25% (C) 30% (D) 35%

40. A fruit vendor purchased 21 apples for ₹180. Because of higher temperature, $33^1/_3$% of apples are rotten and had to be thrown away. The price that the trader charge per apple if he wants to earn a profit of $16^2/_3$% is [ ] . (₹)

41. A trader, by mistake, calculates his profit on the selling price and expresses it as 20%. What is the correct figure of his profit?
(A) 22% (B) 25% (C) 22¼% (D) 23½%

42. By selling an item at $7/10^{th}$ of the actual selling price, a trader makes a profit of 40%. If he sells the product at the actual selling price, then what will be the profit or loss percentage?
(A) 30% (B) 45%
(C) 50% (D) None of these

43. The successive discounts 20% and 15% are equivalent to a single discount of
(A) 35% (B) 38% (C) 32% (D) 29%

44. A trader found that after allowing a discount of 15% on marked price, the selling price is ₹6,800 for an article. Had he sold it at marked price, he would have made a profit of 60%. Cost price of the article is ☐. (₹)

45. A person gets ₹3,000 if he sells either article A at 10% profit and article B at 20% loss or article A at 10% loss and article B at 20% profit. The cost of A is ☐.(₹)

46. An article was sold at a profit of 20%. Had both the cost price and selling price ₹3,000 less, then the profit would be 25%. The original cost price (in ₹) is ☐.

47. P, Q and R invested in a business. P invested $\frac{1}{4}$ th of the capital for $\frac{1}{4}$ th of the time and Q invested $\frac{1}{9}$ th of the capital for $\frac{1}{9}$ th of the time. R invested the remaining capital for the entire period. The total profit made by the business was ₹27,750. The share of Q in this (in ₹) is ☐.

48. Antony, Ben and Charles enter into a business with investments in the ratio of 3 : 4 : 6. At the end of one year, they shared the profits in the ratio of 6 : 4 : 3. Find the ratio of the respective time periods for which they invested.
(A) 1 : 2 : 4 (B) 4 : 2 : 1
(C) 4 : 1 : 2 (D) 1 : 4 : 2

49. X and Y started a business with capitals ₹20,000 and ₹25,000 respectively. After few months Z joined them with a capital of ₹30,000. If the share of Z in the annual profit of ₹50,000 is ₹14,000, then after how many months from the beginning did Z join?
(A) 7 months (B) 6 months
(C) 5 months (D) 4 months

50. Ram, Robert and Raheem start a business. Ram invests one-third of the capital, Robert invests one-fourth of the capital and the rest is invested by Raheem. The share of Raheem in the total profit of ₹2,40,000 is ☐.

51. The price of mangoes has increased from ₹12 per kg to ₹20 per kg. What is the percentage increase in the price of mangoes?
(A) $33^1/_3$% (B) 30% (C) $66^2/_3$% (D) 25%

52. If the price of an article went up by 20%, by what percent should it be brought down to bring it back to the original price?
(A) $16^2/_3$% (B) 20% (C) $22^1/_3$% (D) 15%

53. If the length of a rectangle increases by 20% and the breadth decreases by 10%, then the percentage change in its area will be
(A) 8% increase (B) 8% decrease
(C) 12% increase (D) 12% decrease

54. In the set of three terms, the second and the third terms are 10% and 20% respectively more than the first. What percentage of the third term is the second?
(A) 88% (B) 95% (C) $91^2/_3$% (D) $92^1/_3$%

55. Mohan's salary was first increased by 20%, then decreased by 20%. If his present salary is ₹7,200, then his original salary was ☐ (₹).

56. In a showroom of two-wheelers and four wheelers, 40% of the sales of two-wheelers is same as the sales of four-wheelers, every year. If the total number of four-wheelers sold in 2 years is 1520. then find the number of two-wheelers sold in these 2 years was ☐.

57. The population of a town increases by 5% per year. If the present population is 5,200, then the population of the town after two years is ☐.

58. If the side of a square is decreased by 25%, then by what percent will the area decrease?
(A) 43.25% (B) 44.25%
(C) 43.75% (D) 56.25%

59. Anil spends 40% of his income on rent, 30% of the remaining on medical grounds, 20% of the remaining on education. If he saves ₹840 every month, his monthly salary is ☐ (₹).

60. Ajay got 30% of the maximum marks in a test and failed by 15 marks. Bala got 40% of the maximum marks in it and got 5 marks more than the pass mark. Find the maximum marks and also the pass marks.
(A) 200; 75 (B) 200; 60
(C) 250; 75 (D) 300; 90

61. Francis sold his pen at a profit of ₹5. He calculated his profit percentage on his selling price and found it to be 50%. Find actual his profit percentage.
(A) 100% (B) 150%
(C) 200% (D) 250%

62. A vendor bought 30 dozen bananas at ₹16 per dozen. He sold 10 dozens at ₹20 per dozen and 16 dozens at ₹25 per dozen. The remaining 4 dozens were rotten and he threw them away. Find his profit percentage.
(A) 20% (B) 25% (C) 30% (D) $33^1/_3$%

63. Ravi marked his walkman at 60% above his cost price. If he had decreased his discount from 20% to 10%, he would have earned ₹80 more. His cost price is ☐. (₹)

64. The loss incurred by selling 20 m of a cloth equals the cost price of 5 m of that cloth. Find the loss percentage.
(A) $33^1/_3$% (B) 25% (C) 20% (D) 40%

65. The profit made by selling 25 m of a cloth equals the selling price of 5 m of that cloth. Find the profit percentage.
(A) 25% (B) 20% (C) $16^2/_3$% (D) 30%

66. The loss incurred by selling 16 m of a cloth equals the selling price of 4 m of that cloth. Find the loss percentage.
(A) 15% (B) 20% (C) $33^1/_3$% (D) 25%

67. A watch is sold at a profit of ₹500. If a DVD player, whose cost price is thrice that of the watch is sold for ₹5,400, a profit of 20% is made. Find the profit percentage made on selling the watch. (in ₹)
(A) 25% (B) 50% (C) 20% (D) $33^1/_3$%

68. A trader sold a pair of trousers at 44% profit after announcing two successive discounts of 10% and 20%. At what percentage did he mark the pair of trousers above the cost price?
(A) 60% (B) 100% (C) 180% (D) 175%

69. Anwar and Bhaskar started a business with investments of ₹15,000 and ₹24,000 respectively. At the end of 4 months from the start of the business, each withdrew one-third of his capital. Find the ratio of their profits in the total profit at the end of one year.
(A) 1 : 2 (B) 3 : 4 (C) 4 : 5 (D) 5 : 8

70. A has started a business with an investment of ₹70,000 and after 6 months B joined him investing ₹1,20,000. If the profit at the end of a year is ₹52,000, then the share of B is [ ] (₹).

71. Ram and Shyam started a business jointly. Ram's investment was thrice that of Shyam's and period of his investment was half that of Shyam's. If Ram receives ₹19,200 as profit, then their total profit is [ ] (₹).

72. A, B and C invested a total capital of ₹60 lakhs in a business. B invested ₹10 lakhs more than A and ₹5 lakhs more than C. The share of C out of a total profit of ₹18 lakhs (₹ in lakhs) is [ ] .

73. Ratan purchased a gold coin and sold it to Kesav at 10% profit. As Keshav needs money, he sold it back to Ratan at the purchasing price of Ratan. Keshav incurred a loss of
(A) 9% (B) 11%
(C) $9^1/_{11}$% (D) $11^1/_9$%

74. A trader purchased an article at 20% discount on the marked price from a distributor. What percent of discount on the marked price should the trader allow to gain 20%?
(A) 0% (B) 4% (C) 6% (D) 8%

75. A trader would incur a loss of 15%, if he sells pens at ₹10.20 per pen. If 12.5% profit is to be earned after allowing 10% discount on the marked price, find the marked price (in ₹).
[ ]

Exercise – 4
(Simple Interest and Compound Interest)

Directions for questions 1 to 25: For the Multiple Choice Questions, select the correct alternative from the given choices. For the Non-Multiple Choice Questions, write your answer in the box provided.

1. The amount that Kiran would receive if he invests ₹18,000 at 15% p.a. simple interest for four years is [ ] (₹).

2. The number of years in which a sum of ₹5,000 yields a simple interest of ₹16,500 at 15% p.a. is [ ] (₹)

3. A sum of ₹3,700 amounts to ₹5,476 in four years invested at simple interest. If the rate of interest is 6% p.a. more, then, in the same time period, the sum becomes [ ] (₹).

4. The sum that will yield a simple interest of ₹1,368 in three years at 12% p.a. is [ ] (₹).

5. A certain sum becomes ₹20,720 in four years and ₹24,080 in six years at simple interest. Find the sum and rate of interest.
(A) ₹12,000; 12% p.a. (B) ₹14,000; 12% p.a.
(C) ₹12,000; 15% p.a. (D) ₹14,000; 15% p.a.

6. A certain sum becomes three times itself at simple interest in six years. It will become eight times itself in [ ] years.

7. In how many years does a sum become four times itself at 25% p.a. simple interest?
(A) 12 (B) 15 (C) 10 (D) 17

8. A certain sum yields ₹840 more interest if it is invested at 18% p.a. than at 12% p.a. for two years, at simple interest, then the sum is [ ] . (₹)

9. The simple interest on a certain sum with the rate of interest being 7% p.a., 10% p.a. and 12% p.a., for the first year, second year and third years respectively is ₹8,178. The sum is [ ] . (₹)

10. A sum becomes 7/5 times itself in three years at simple interest. Find the rate of interest.
(A) $13^2/_3$% p.a. (B) $12^2/_3$% p.a.
(C) $13^1/_3$% p.a. (D) $12^1/_3$% p.a.

11. The compound interest on ₹18,000 at 15% p.a. for two years is [ ] . (₹)

12. A sum invested at 20% p.a. compound interest gives an interest of ₹5544 in two years. The sum invested is [ ] . (₹)

13. Compound interest earned on a sum for second and third years are ₹1,200 and ₹1,440 respectively. Find the rate of interest. Also find the sum.
(A) 18% p.a.; ₹6,000 (B) 20% p.a.; ₹5,000
(C) 20% p.a.; ₹6,000 (D) 24% p.a.; ₹5,000

14. A sum of ₹4,800 is invested at compound interest for three years, the rate of interest being 10% p.a., 20% p.a. and 25% p.a. for 1st, 2nd and 3rd years respectively. The interest received at the end of 3 years is [ ]. (₹)

15. A sum of money doubles at compound interest in three years. It becomes eight times itself in [ ] years.

16. (a) The amount that Kiran receives if he invests ₹2,400 at 20% p.a. compound interest for 1 year, compounding done semi annually is [ ]. (₹)

(b) The compound interest on ₹2,000 for nine months at 40% p.a., compounded quarterly is [ ]. (₹)

17. The difference between the compound interest on ₹12,000 at 20% p.a. for one year when compounded yearly and half yearly is [ ]. (₹)

18. The difference between simple and compound interest on ₹10,000 at 15% p.a. for two years is [ ]. (₹)

19. A person gets ₹200 more interest by investing ₹20,000 at R% p.a. compound interest instead of simple interest for two years then R is [ ] %

20. The simple interest and compound interest on a certain sum for two years are ₹800 and ₹960 respectively. Find the rate of interest as well as the sum.
(A) 30% p.a.; ₹2,000 (B) 40% p.a.; ₹2,000
(C) 40% p.a.; ₹1,000 (D) 45% p.a.; ₹1,000

21. A sum becomes ₹24,200 in 2 years and ₹29,282 in 4 years at a certain rate of compound interest, compounded annually. Find the rate of interest.
(A) 12% p.a. (B) 11% p.a.
(C) 13% p.a. (D) 10% p.a.

22. A sum of money is invested for 3 years at compound interest, the rate of interest being 20% p.a., 10% p.a. and 25% p.a. for the first second and third years respectively. If the sum becomes ₹13,695, then the sum is [ ]. (₹)

23. What rate of interest per annum does a person get if he invests at 40% p.a. compound interest, interest being compounded half-yearly?
(A) 42% (B) 48% (C) 44% (D) 46%

24. The simple interest and compound interest on a certain sum for two years are ₹1,800 and ₹1,980 respectively. Find the sum and the rate of interest.
(A) ₹3,000, 20% p.a. (B) ₹4,500, 20% p.a.
(C) ₹4,500, 10% p.a. (D) ₹8,600, 15% p.a.

25. A borrowed ₹8,900 from B at 9% p.a. simple interest and lends it to C, at 10% p.a. compounded interest compounded half yearly. The profit made by A, at the end of one year is [ ]. (in ₹)

Exercise – 5
(Time and Distance)

Directions for questions 1 to 50: For the Multiple Choice Questions, select the correct alternative from the given choices. For the Non-Multiple Choice Questions, write your answer in the box provided.

1. Convert the following speeds into metres per second

(a) 54 kmph = [ ] (m/sec)

(b) 108 kmph = [ ] (m/sec)

(c) 21.6 kmph = [ ] (m/sec)

2. Convert the following speeds into kilometres per hour.

(a) 20 m/s = [ ] kmph.

(b) 45 m/s = [ ] kmph.

(c) 12·5 m/s = [ ] kmph.

(d) 13/36 m/s = [ ] kmph.

3. A person covers 11 metres in 3 seconds. How many kilometres can he cover in 1 hour 40 minutes by traveling at the same rate?
(A) 21 (B) 20 (C) 23 (D) 22

4. Varma covered 22·5 km in 3 hours 20 minutes. He covered the first 10 km at 8 kmph. If he covered the remaining distance at a uniform speed at what uniform speed did he cover the remaining distance?
(A) 8 kmph (B) 7 kmph
(C) 5 kmph (D) 6 kmph

5. Pavan travelled for 11 hours. He covered the first half of the distance at 30 kmph and the remaining half of the distance at 25 kmph. The distance travelled by Pavan is [ ]. (in km).

6. A person takes 20 minutes more to cover a certain distance as he decreased his speed by 20%. The time taken to cover the distance at his original speed.
(A) 1 hour 30 minutes (B) 1 hour 15 minutes
(C) 1 hour 20 minutes (D) 2 hours

7. Travelling at a speed of 8 kmph, a student reaches school from his house 10 minutes early. If he travels at 6 kmph, he is late by 20 minutes. The distance between the school and the house is ☐.

8. Travelling from his house at 30 kmph, a person is late to his office by 5 minutes. If he increases his speed by 10 kmph, he would be early by 15 minutes to his office. What should be his speed so that he reaches his office on time?
(A) 36 kmph (B) 32 kmph
(C) 34 kmph (D) 35 kmph

9. A train covered x km at 45 kmph and then another x km at 36 kmph. The average speed of the train in covering the entire journey is ☐ kmph.

10. By travelling at an average speed of 40 kmph a person reaches his destination on time. He covered two-third of the total distance in one-third of the total time. The speed he should maintain for the remaining distance to reach his destination on time is ☐ kmph.

11. Kiran travels from A to B by car and returns from B to A by cycle in 7 hours. If he travels both ways by car he saves 3 hours. The time taken to cover both ways by cycle is ☐ hrs.

12. The ratio of the speeds of A and B is 3 : 2. A and B start simultaneously towards each other from P and Q respectively. If they meet 20 km from Q, then the distance between P and Q is ☐ km.

13. A bus leaves Pune at 6:00 p.m. and reaches Hyderabad at 8:00 a.m. and another bus leaves Hyderabad at 8:00 p.m. and reaches Pune at 10:00 a.m. When will the two buses cross each other?
(A) 2:30 a.m. (B) 1:30 a.m.
(C) 3:00 a.m. (D) 2:00 a.m.

14. Kishore and Krishna start from the same point at the same time at speeds of 20 kmph and 25 kmph respectively. How many kilometres apart will they be from each other in 4 hours if (a) they are moving in opposite direction? (b) they are moving in the same direction?
(A) (a) 180 (b) 60 (B) (a) 180 (b) 20
(C) (a) 120 (b) 40 (D) (a) 120 (b) 60

15. A 600 m long train is running at a speed of 54 kmph. In how much time will it cross a standing person?
(A) 38 sec (B) 35 sec (C) 42 sec (D) 40 sec

16. A train running at a speed of 36 kmph crosses an electric pole in 12 seconds. The time it will take to cross a platform 350 m long is ☐ (sec).

17. A train, 800 m long, crosses a tunnel of length 400 m in 120 seconds. The speed of the train in kmph is ☐.

18. A train, 250 m long, is running at 30 kmph. The time in which the train will cross another train of length 150 m, running at a speed of 42 kmph, in the opposite direction to the train is ☐ sec.

19. A train, 375 m long, is running at 50 kmph. The time in which the train will cross a person moving at 4 kmph in the opposite direction to the train is ☐ sec.

20. A train leaves Mumbai at 9 am at a speed of 40 kmph. After one hour another train leaves Mumbai in the same direction as that of the first train at a speed of 50 kmph. When and at what distance from Mumbai did the two trains meet?
(A) 1.00 pm, 220 km
(B) 1.00 pm, 200 km
(C) 2.00 pm, 200 km
(D) 2.00 pm, 220 km

21. Two trains of equal lengths are running at speeds of 30 kmph and 60 kmph. The two trains crossed each other in 30 seconds when travelling in opposite direction. The time they will take to cross each other when travelling in the same direction is ☐ sec.

22. If a man can cover 12 metres in one second, how many kilometres can he cover in 3 hours 45 minutes by traveling at the same rate?
(A) 168 (B) 162 (C) 150 (D) 156

23. A man can cover 8 m in one second. The time taken by him in hours to cover 180 km by traveling at the same rate is ☐.

24. A person covered 60 km travelling equal distances at 10 kmph, 20 kmph, 30 kmph. What is the total time taken to cover the distance?
(A) $3\frac{2}{3}$ hours (B) $2\frac{1}{3}$ hours
(C) $3\frac{1}{3}$ hours (D) $2\frac{2}{3}$ hours

25. Prabhakar travelled for 1 hour 24 minutes. He covered the first half of the distance at 30 kmph and remaining distance at 75 kmph. The total distance he travelled is ☐ km.

26. A person reaches his office 1 hour late travelling at 40 kmph. If he travels at 50 kmph, he is late by 40 minutes. What is the distance he has to travel to reach his office?
(A) $56\frac{1}{3}$ km (B) $66\frac{2}{3}$ km
(C) 59 km (D) 63 km

27. While covering a certain distance if a person increases his speed from 50 kmph to 60 kmph he saves 5 minutes. The distance covered by him is ☐ km.

28. A person travelled from A to B at 40 kmph and returned back at 60 kmph. His average speed for the entire journey is ☐ kmph.

29. Three cars have the ratio of their speeds as 5 : 6 : 7. Find the ratio of the times they would take to travel a certain distance.
(A) 7 : 6 : 5 (B) 30 : 35 : 42
(C) 5 : 6 : 7 (D) 42 : 35 : 30

30. Had a person travelled 3 kmph faster he would have taken 2 hours less to cover a certain distance. Had he travelled 4 kmph slower he would have taken 5 hours more to cover the same distance. The distance is ☐ km.

31. Bharani and Anand are 180 km apart. They start simultaneously towards each other at speeds of 10 kmph and 20 kmph respectively. In how many hours will they meet?
(A) 5 (B) 6 (C) 4 (D) 7

32. When its usual speed is decreased by 5 m/s, a train takes 2 hours more to cover 160 km. The usual speed of the train is ☐ kmph.

33. A train crosses a platform of length 200 m in 18 seconds and a 275 m long platform in 27 seconds. The speed of the train is ☐ kmph.

34. A train, 280 m long, is running at 27 kmph. What is the time taken by the train to cross a person standing on a platform?
(A) $37\frac{2}{3}$ sec (B) $38\frac{1}{3}$ sec
(C) $38\frac{2}{3}$ sec (D) $37\frac{1}{3}$ sec

35. A train, 225 m long, crossed a 175 m long platform in 10 seconds. The speed of the train is ☐ m/sec.

36. A train, 245 m long, running at 60 kmph crosses another train moving in the same direction at 38 kmph in 90 seconds. The length of the second train is ☐ m.

37. A train, 600 m long, is running at 45 kmph. In what time will it cross a person moving at 9 kmph in the opposite direction?
(A) 36 sec (B) 40 sec (C) 34 sec (D) 38 sec

38. In a 500 m race, A beats B by 20 m and C by 30 m. In a 2880 m race, by how many metres does B beat C?
(A) 50 (B) 60 (C) 55 (D) 45

39. In an 800 m race, A beats B by 160 m or 20 seconds. The speed of A in metres per second is ☐ .

40. A is $1^2/_3$ times as fast as B. If B is given a head start of 200 metres, what should be the length of the race so that both of them complete the race at the same time?
(A) 400 m (B) 550 m (C) 450 m (D) 500 m

41. A train leaves station P at 6.00 am and reaches station Q at 3.00 pm. Another train leaves station Q at 7.00 am and reaches station P at 4.00 pm. When will the two trains meet?
(A) 10:30 am (B) 11:30 am
(C) 11:00 am (D) 10:00 am

42. Two persons start running simultaneously around a circular track of length 300 m from the same point at speeds of 15 km/hr and 25 km/hr. When will they meet for the first time anywhere on the track if they are moving in opposite directions?
(A) 21 sec (B) 24 sec (C) 25 sec (D) 27 sec

43. A and B start running simultaneously around a circular track of length 600 m from the same point on a cycle at speeds of 36 kmph and 54 kmph respectively. After how much time will they meet for the first time at the starting point?
(A) 120 sec (B) 150 sec
(C) 140 sec (D) 130 sec

44. A man can row downstream at 18 kmph and upstream at 10 kmph. Find the speed of the man in still water and the speed of the stream (both in kmph) respectively.
(A) 13, 3 (B) 12, 6 (C) 15, 3 (D) 14, 4

45. A person can row at 9 kmph in still water. The speed of the stream is 1 kmph. He takes $4^1/_2$ hours to row from A to B and back. The distance (in km) between A and B is ☐ .

46. Time taken by a man to row upstream is 3/2 times taken by him to row downstream. If the product of the speeds of the man and the stream (both in kmph) is 20, the speed of man in still water is ☐ kmph.

47. In a 1000 m race, A beats B by 100 m and B beats C by 50 m. In the same race, by how many metres does A beat C?
(A) 145 (B) 150 (C) 155 (D) 160

48. In a 1 km race, A beats B by 100 m and C by 150 m. In a 2700 m race, by how many metres does B beat C?
(A) 120 (B) 150 (C) 210 (D) 180

49. A and B are running around a circular track 600 m long in opposite direction at speeds of 15 m/s and 10 m/s respectively starting at the same time from the same point. In how much time will they meet for the first time anywhere on the track?
(A) 60 sec (B) 24 sec (C) 36 sec (D) 50 sec

50. A and B run around a circular track of length 720 m at speeds of 12 m/s and 18 m/s respectively. They start at the same time from the same point in opposite direction. After how long will they meet for the first time at the starting point?
(A) 100 sec (B) 130 sec (C) 110 sec (D) 120 sec