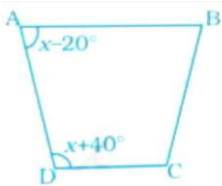


PART – A (1 to 20)

• **Each question five marks:**

1. Find the following products: $(0.9x + 0.7y)(0.81x^2 + 0.63xy + 0.49y^2)$
2. What is the smallest number which when increased by 5 is divisible by 12, 18 and 30?
3. Ramesh travels by bus from city A to city B at an average speed of 44km/hr. Suresh travels by taxi from city A to city B at an average speed of 77 km/h and takes 3 hours lesser than time taken by Ramesh. What is the distance (in km) between the two cities?
4. Find the smallest number by which 128 must be divided to obtain a perfect cube.
5. How many numbers between 100 and 300 are divisible by 7?
6. Find the compound interest on Rs. 10,000 for 2 years at 8% per annum if the interest is compounded annually.
7. A train moving with a speed of 60 km per hour crosses an electric pole in 30 seconds. What is the length of the train in meters?
8. Simplify : $\frac{5^{n+4} - 6 \times 5^{n+2}}{9 \times 5^{n+1} - 5^{n+1} \times 4}$
9. The angle of a triangle are x, y and 40. The difference between the two angles x and y is 30. Find the value of x and y.
10. Find the least number which when divided by 24,32 and 36 leaves the remainders 19,27 and 31, respectively.
11. If $3x + 4y = 12$ and $4x + 3y = 9$, then find the value of $x + y$
12. 5 men and 8 women can complete a task in 34 days, whereas 4 men and 18 women can complete the same task in 28 days. In how many days can the same task can be completed by 3 men and 5 women?
13. Find the value of x in the trapezium ABCD given below.



14. If $x + \frac{1}{x} = 2$, then find $x^{2013} + \frac{1}{x^{2014}} = ?$
15. A boat covers 63 km upstream in 9 hours and covers the same distance downstream in 7 hours. What is the speed (in km/hr) of the boat in still water?
16. Find the greatest number of four digits which is exactly divisible by 48, 60 and 64.
17. The area of a triangle is 15 sq cm and the radius of its incircle is 3 cm. Its perimeter is equal to:
18. A train travels the distance between stations P and Q at a speed of 126 km/h, while in the opposite direction it comes back at 90 km/h. Another train travels the same distance at the average speed of the first train. The time taken by the second train to travel 525 km is:
19. A wire when bent in the form of an equilateral triangle encloses an area of $121\sqrt{3}$ cm². If the same wire is bent into the form of a circle, what will be the area of the circle? [Take $\pi = \frac{22}{7}$]

20. Two articles are sold for Rs.9,720 each. On one, the seller gains 8% and on the other, he loses 10%. What is his overall gain or loss?

PART – B (21 to 30)

- Each question ten marks:

21. The value on an article depreciates every year at the rate of 10% of its value. If the present value of the article is Rs.729, then its worth 3 years ago was

22. A man goes downstream with a boat to sum destination and returns upstream to his original place in 5 hrs. If the speed of the boat in still water and the streams are 10 kmph and 4 kmph respectively, what is the distance of the destination from the starting place?

23. A mixture of 20 kg of spirit and water contains 10% water. After adding a certain amount of water, the weight of the new mixture is 25 kg. What is the percentage of water in the new mixture?

24. The population of a village was 9600. In a year, with the increase in population of males by 8% and that of females by 5%, the population of the village became 10272. What was the number of males in the village before increase?

25. A train travels the distance between stations P and Q at a speed of 126 km/h, while in the opposite direction it comes back at 90 km/h. Another train travels the same distance at the average speed of the first train. The time taken by the second train to travel 525 km is:

26. A milkman has three different qualities of milk. 403 gallons of 1st quality, 465 gallons of 2nd quality and 496 gallons of 3rd quality. Find the least possible number of bottles of equal size in which different milk of different qualities can be filled without mixing?

27. Five question were asked in an examination. 5% of the total examinees answered all 5 questions and 5% of total examinees did not answered any question. 25% of the rest of the examinees answered only 1 question and 20% answered 4 questions. $24\frac{1}{2}\%$ of the total examinees answered only 2 questions. If 200 examinees answered 3 questions, then find the total number of examinees.

28. In a class of 100 students, every student has passed in one or more of the three subjects, i.e. History, Economics and English. Among all the students, 24 students have passed in English only, 14 students have passed in History only, 11 students have passed in both English and Economics only, and 12 students have passed in both English and History only. A total of 50 students have passed in History. If only 5 students have passed in all three subjects, then how many students have passed in Economics only?

29. A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled into it. The diameter of the pencil is 7mm, the diameter of the graphite is 1mm and the length of the pencil is 14cm. Find the:

(i) Volume of the graphite

(ii) Volume of the wood

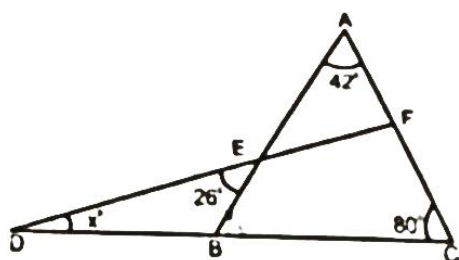
(iii) The weight of the whole pencil, if the specific gravity of the wood is 0.7gm / cm³ and that of the graphite is 2.1gm / cm³

30. A man give 50% of his savings of ₹ 84100 to his wife and divided the remaining sum among his two sons A and B of 15 and 13 years of age respectively, he divided it in such a way that age of his son, when they attain the age of 18 years, would receive the same amount at 5% compounded interest per annum. What is the share of B?

PART – A (1 to 20)

• Each question five marks:

- How many numbers between 400 and 700 are divisible by 5, 6 and 7?
- The LCM of two numbers is 28 times of their HCF. The sum of their LCM and HCF is 1740. If one number is 240 then what is the other number?
- Find the least number which when divided by 12, 18, 36 and 45 leaves the remainder 8, 14, 32 and 41 respectively.
- 800 chocolates were distributed among the students of a class. If each student got twice as many chocolates as the number of students in the class, then the number of students in the class was
- A man covered a distance of 2000 km in 18 hours partly by bus at 72 km/hr and partly by train at 160 km/hr. The distance covered by bus is
- $a - \frac{1}{a-3} = 5$, then the value of $(a - 3)^3 - \frac{1}{(a-3)^3} = ?$
- Average income of A and B ₹ 200 and average income of C and D is ₹ 250. What is the average income of A, B, C and D?
- If Manohar pays an interest of Rs 1750 for 2 years on a sum of Rs 4,500, find the rate of interest.
- Find the area of an equilateral triangle whose sides are 12 cm.
- A student was asked to multiply a number by $\frac{3}{2}$ but he divided that number by $\frac{3}{2}$. His result was 10 less than the correct answer. The number was:
- On the first day of the sale of tickets of a drama, in all 35 tickets were sold. If the rates of the tickets were Rs. 20 and Rs. 40 per ticket and the total collection was Rs. 900. Find the number of tickets sold at each rate.
- In the figure $\angle BAC = 42^\circ$, $\angle ABC = 80^\circ$, $\angle FDC = X$, $\angle DEB = 26^\circ$. Find the value of X.



- The population of a city is 200000. It grows at the rate of 10 percent per annum. What will be the population of that city after 2 years?
- Cost of manufacturing in article was ₹ 900. The trader was to gain 25% after giving a discount 10%. What is the marked price?
- The diagonal of a rectangle is thrice its smaller side. Find the ratio of its sides.
- Three prizes are to be distributed in a quiz contest. The value of the second prize is five-sixths the value of the first prize and the value of the third prize is four-fifths that of the second prize. If the total value of the three prize is Rs 450, Find the value of each prize.
- Two buses do a journey between two cities 200km apart. One bus A moves at 50 kph one way a return. The other bus B does 45kph on both journeys.

(i) Which bus takes lesser time to cover the distance.

(ii) Do they both take equal time.

18. Find seven rational numbers between $\frac{1}{3}$ and $\frac{1}{2}$.

19. If the selling price of an article is 25% of its cost price, then what will be the loss percentage?

20. A can complete a work in 12 days and B can complete the same work in 15 days. Both started work together but after 4 days A left the work. In how many days the remaining work is completed by B?

PART – B (21 to 30)

• Each question ten marks:

21. The average age of 40 students in a class is 15 yr. When 10 new students are admitted, the average is increased by 0.2 yr. Find the average age of the new students.

22. In order to maintain the price line a trader allows a discount of 10% on the marked price of an article. However, he still makes a profit of 17% on the cost price. Had he sold the article at the marked price, he would have earned a profit per cent of

23. Two numbers are in the ratio 3:5. If 13 is subtracted from each, the new numbers are in the ratio 10:21. If 15 is added to each of the original numbers, then the ratio becomes:

24. A playground is in the shape of rectangle. A sum of ₹ 1000 was spent to make the ground usable at the rate of 25 paise per sq. m. The breadth of the ground is 50 m, if the length of ground is increased by 20 m, what will be the expenditure (in ₹) at the same rate per sq. m?

25. In a wallet, there are notes of the denominations of ₹ 10 and 50. The total notes is 12. The number of ₹ 10 and 50 notes are in the ratio of 1:2. Total money in the wallet is:

26. A and B can complete a work in 8 days B & C can complete that work in 12 days and C and A completes that work in 8 days. Accordingly, in how many days all the three can complete that work?

27. A lent 5000 to B for 2 years and ₹ 3000 to C for 4 years on simple interest at the same rate of interest and received 2200 in all from both as interest. The rate of interest per annum is

28. A farmer has 945 cows and 2475 sheep. He farms them into flocks, keeping cows and sheep separate and having the same number of animals in each flocks. If these flocks are as large as possible, then the maximum number of animals of each flocks and total number of flocks required for the purpose are respectively?

29. A shopkeeper buys in article for ₹ 180. He wishes to gain 20% after allowing a discount of 10% on the marked price to the customer. What is the marked price will be?

30.
$$\frac{\frac{1}{3} \times \frac{1}{3} \times \frac{1}{4} + \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} - 3 \times \frac{1}{3} \times \frac{1}{4} \times \frac{1}{5} + \frac{1}{5} \times \frac{1}{5} \times \frac{1}{5}}{\frac{1}{3} \times \frac{1}{3} + \frac{1}{4} \times \frac{1}{4} + \frac{1}{5} \times \frac{1}{5} - \left(\frac{1}{3} \times \frac{1}{4} + \frac{1}{4} \times \frac{1}{5} + \frac{1}{5} \times \frac{1}{3} \right)} = ?$$

RIMC SCHOLARSHIP EXAM Set - C

JUNE 2024

SUBJECT: MATHEMATICS

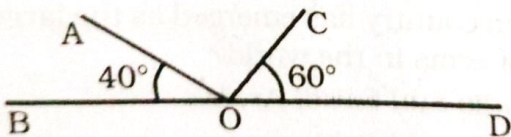
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PART – A (1 to 20)

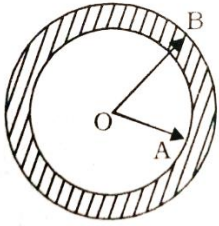
• **Each question five marks:**

1. What will be the ratio between the area of a rectangle and the area of a triangle with one of the sides of the rectangle as base and a vertex on the opposite side of the rectangle?
2. The length of the bridge, which a train 170 metre long and travelling at 85 kmph can cross in 30 seconds, is
3. 30 men or 90 women can do a certain work in 75 days. In how many days will 10 men and 15 women do the same work?
4. The HCF of two numbers is 23 and the other two factors of their LCM are 13 and 14. The larger of the two numbers is
5. $\sqrt{\frac{0.081 \times 0.324 \times 2.89}{1.5625 \times 0.0289 \times 64}} = ?$
6. A family consists of grandparents, parents and three grandchildren. The average age of the grand- parents is 85 years, that of the parents is 45 years and that of grand children is 13 years. The average age of the family is
7. In a rectangular tank of length 20 metre and breadth 10m water is 2 metre deep. If the water of this tank is transferred to another rectangular tank of length 10 metre and breadth 5 metre. Then the depth of water in second tank will be.
8. In a school there are 500 students. Out of them 300 students are girls. On one particular day 20 boys and 80 girls were absent. What percent of students were present on that particular day? What percentage of boys in the school?
9. The students of a school have to go on a picnic at 10 A.M. Their bus came 45 minutes late. During journey, due to some technical fault they further got late by 37 minutes. If everything were right they would reach at 11 : 35 A.M. Now they reach at what time?
10. If the shadow of 1-metre-long pole is 75 cm, what will be the height of a tree whose shadow is 15 metre long?
11. The measure of $\angle AOC$ in the following figure is:



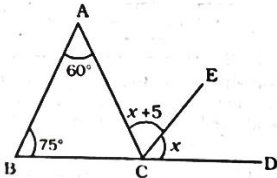
12. Simplification of $2.75 - 1.25 + 4.75 - 3.80$ in fractional form is
13. An article is sold for Rs. 500 and hence a loss is incurred. Had the article been sold for Rs. 700, the shopkeeper would have gained three times the former loss. What is the cost price of the article?
14. A light is seen at intervals of 13 seconds. It was seen for the first time at 1 hr. 54 minutes, 51 secs. a.m. and the last at 2 hrs 17 min. 49 secs. a.m. How many times was the light seen?

15. The area of the shaded region in the following figure is



OA = 21 cm., OB = 28 cm.

16. What is the value of x in the following figure?



17. Village X has a population of 68000, which is decreasing at the rate of 1200 per year. Village Y has a population of 42000, which is increasing at the rate of 800 per year. In how many years will the population of the two villages be equal?

18. Find the largest number of four digits exactly divisible by 12, 15, 18 and 27.

19. A man earns Rs. 20 on the first day and spends Rs. 15 on the next day. He again earns Rs. 20 on the third day and spends Rs. 15 on the fourth day. If he continues to save like this, how soon will he have Rs. 60 in hand?

20. If A: B = 2: 3, B: C = 3: 4 and C: D = 4:5, then A:D=?

PART – B (21 to 30)

• **Each question ten marks:**

21. Rajiv took some money on loan at 12% annual rate of interest. After 5 years he returned a total of Rs. 7680 which included simple interest and principal. How much money has Rajiv given as interest?

22. A student was asked to solve the fraction $\frac{\frac{7}{3} + 1\frac{1}{2} \text{ of } \frac{5}{3}}{2 + 1\frac{2}{3}}$ and his answer was $\frac{1}{4}$. By how much was his answer wrong?

23. In an examination, the average for the entire class was 80 marks. If 10% of the students scored average 95 marks and 20% students scored average 90 marks, what was the average marks of the remaining students of the class?

24. Sohan covers $\frac{1}{4}$ th of his journey by train, $\frac{2}{5}$ th part by bus and remaining journey by car. If the total distance covered is 1000 km, the distance covered by car will be –

25. If angles A, B and C in a triangle ABC, are $2x$, $5x + 7$ and $7x + 5$ respectively, then find all the three angles.

26. A boy was asked to multiply a number by 25. He instead multiplied the number by 52 and got the answer 324 more than the correct answer. The number to be multiplied is

27. One-metre-wide path is built inside a square park of side 30 m along its sides. The remaining part of the park is covered by grass. If the total cost of covering by grass is ₹ 1176, find the rate per square metre at which the park is covered by the grass.

28. A man buys a T.V. set priced at ₹ 16000. He pays ₹ 4000 at once and the rest after 15 months on which he is charged a simple interest at the rate of 12% per annum. The total amount he pays for the T.V. set is

29. A tortoise can climb upto 5 m in first hour. Next hour it climbs down to 4 m. It is trying to reach a platform of 15 m. Find number of hours require to the tortoise to climb up the platform.

30. A can build a wall in 8 days and B can build it in 12 days while C can completely destroy it in 24 days. If they start working at the same time, in how many days will the work be completed.