SEAL

R/A/A EXAM. 2021

300037

ELEMENTARY MATHEMATICS

Time : 3 hours] [Full Marks : 100

Notes : **All** questions are compulsory.

Question numbers **1** to **20** carry **2** marks each :

1. 1 million = _____ hundred thousand.

2. Write the following in Roman numerals :

(a) 69

(b) 98

3. Write the smallest composite number.

4. Write the condition of divisibility of a number by 11.

5. Find the least number which when divided by 12, 16, 24 and 36 leaves a remainder of 7 in each case.

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6. Which direction will you face, if you start facing west and make $\frac{3}{4}$ of a revolution anticlockwise?

7. In a class *A* of 25 students, 20 passed with 60% or more marks; in another class *B* of 30 students, 24 passed with 60% or more marks. In which class, a greater fraction of students passed with 60% or more marks?

8. What is the length of the wooden strip required to frame a photograph of length 32 cm and breadth 21 cm?

9. What is the multiplicative identity for the set of integers?

10. John solved $\frac{5}{7}$ part of an exercise while Peter solved $\frac{4}{5}$ of it. Who solved the lesser part?

11. Simplify $3\frac{1}{3}+33\frac{1}{3}+333\frac{1}{3}+3333\frac{1}{3}+33333\frac{1}{3}+333333\frac{1}{3}$

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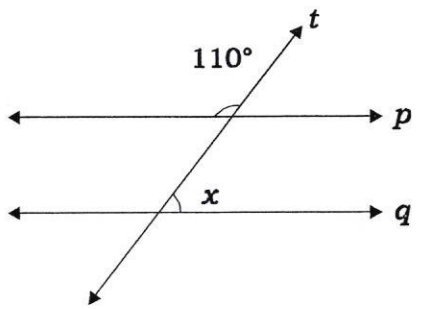
12. Each side of a regular polygon is 2.89 cm in length. The perimeter of the polygon is 23.12 cm. How many sides does the polygon have?

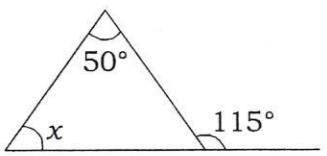
13. A shopkeeper sells mangoes in two types of boxes, one small and one large. A large box contains as many as 6 small boxes plus 5 loose mangoes. Set up an equation which gives the number of mangoes in each small box. The number of mangoes in a large box is given to be 47.

14. Can two obtuse angles be supplementary ? Justify your answer.

15. Find the value of x in the following figure if $p \parallel q$:



16. Find the value of x in the following figure :



17. Write four congruence conditions of triangles.

18. Rahul bought a laptop and saved ₹ 5,000 when a discount of 20% was given. What was the price of the laptop before the discount?

19. Arrange the following rational numbers in ascending order :

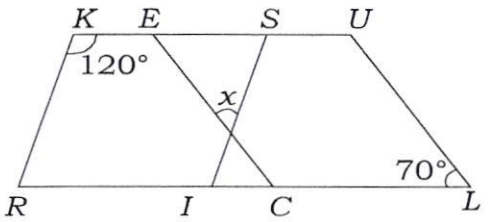
$$\frac{-1}{3}, \frac{-2}{9}, \frac{-4}{3}$$

20. The perimeter of a rectangular sheet is 100 cm. If the length is 35 cm, find its breadth. Also find its area.

Question numbers ***21*** *to* ***26*** *carry* ***4*** *marks each* :

21. Mogembo has 3 times as many two-rupee coins as he has five-rupee coins. If he has in all a sum of ₹ 77, how many coins of each denomination does he have ?

22. In the following figure both RISK and CLUE are parallelograms :



Find the value of x.

23. Is 53240 a perfect cube? If not, then by which smallest natural number should 53240 be divided so that the quotient is a perfect cube?

24. A shopkeeper bought a digital camera and a TV for ₹ 8,000 each. On selling, the shopkeeper made a loss of 4% on the digital camera and a profit of 8% on the TV. Find the gain or loss percent on the whole transaction.

25. What amount is to be repaid on a loan of ₹ 12,000 for $1\frac{1}{2}$ years at 10% per annum compounded half yearly?

26. Find the value of $t^6+\frac{1}{t^6}$, if $t-\frac{1}{t}=2$.

Question numbers ***27*** *to* ***32*** *carry* ***6*** *marks each* :

27. Ramesh has a piece of land which is in the shape of a rhombus. He wants his one daughter and one son to work on the land and produce different crops. He divided the land in two equal parts. If the perimeter of the land is 400 m and one of the diagonals is 160 m, how much area each of them will get for their crops?

28. Curved surface area of a cone is 308 cm^2 and its slant height is 14 cm. Find *(a)* radius of the base and *(b)* total surface area of the cone.

29. A family with a monthly income of ₹ 20,000 had planned the following expenditures per month under various heads :

Heads	**Expenditure (in thousand rupees)**
Grocery	4
Rent	5
Education of children	5
Medicine	2
Fuel	2
Entertainment	1
Miscellaneous	1

Draw a bar graph for the above data.

30. Two coins are tossed simultaneously 500 times and we get the following :

Two heads : 105 times

One head : 275 times

No head : 120 times

Find the probability of occurrence of each of these events.

31. Katrina borrows ₹ 12,500 at 12% per annum for 3 years at simple interest and Radha borrows the same amount for the same time period at 10% per annum, compounded annually. Who pays more interest and by how much?

32. A floor of a building consists of 3,000 tiles which are rhombus shaped and its diagonals are 45 cm and 30 cm in length. Find the total cost of polishing the floor, if the cost per m^2 is ₹ 4.

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