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RASHTRIYA INDIAN MILITARY COLLEGE (RIMC), DEHRADUN

ENTRANCE EXAMINATION – DEC 2021

SUBJECT : MATHEMATICS

TIME : 1.30 HOUR

MAX MARKS – 200

PART A (20 X 5 = 100 MARKS)

Q1. What is co-prime numbers ? write two pairs of co-prime numbers.

Q2. Evaluate : $\left\{ \left(\frac{1}{3}\right)^{-1} - \left(\frac{1}{4}\right)^{-1} \right\}^{-1}$

Q3. Arrange $\frac{7}{8}$, $\frac{5}{6}$, $\frac{6}{7}$ in descending order .

Q4. If $x^2 + \frac{1}{x^2} = 51$. Find the value of $x^3 - \frac{1}{x^3}$

Q5. Find the value of x for the equation : $\frac{(2+x)(7-x)}{(5-x)(4+x)} = 1$

Q6. Nakul starts his journey to his school by scooter at 9 am and reaches his school at 1 pm , If he drives the scooter at a speed at 30 km/hr. By how much should he increase the speed of the scooter so that he can reach the school by 12 noon ?

Q7. Laxmi is cashier in a bank. She has currency notes of denominations Rs.100 , Rs.50 and Rs.10. The ratio of the number of these notes is 2 :3 :5. The total cash with Laxmi is Rs.4, 00,000. How many notes of each denomination does she have ?

Q8. Monica , Veronica and Rachat begin to jog around a circular stadium . they complete their revolutions in 42s , 56s and 63s respectively. After how many seconds will they be together at the starting point ?

Q9. A boat goes 30Km upstream and 44Km downstream in 10 hours . In 13 hour it goes 40 Km upstream and 55 Km downstream. Determine the speed of the stream and that of the boat in still water .

Q10. Find the missing number in the box

8	3	21
6	5	25
12	2	



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Q11. What number should replace the question mark

6	5
126	?

Q12. If 50% of $(x - y) = 40\%$ of $(x + y)$, then what percentage of x is y ?

Q13. In a shooting competition, Gyan receives Rs.5 if he hits the mark and pays Rs.2 if he misses it. He tried 60 shots and was paid Rs.13. How many times did he hit the marks?

Q14. Find the area of a ring whose outer and inner radii are 20 cm and 15 cm .The ratio of the radii of two cylinders is 2:3 and ratio of their heights is 5:3 . The ratio of their volumes will be?

Q15. The ratio of the radii of two cylinders is 2:3 and ratio of their heights is 5: 3 . The ratio of their volumes will be?

Q16. A man brought a certain number of books for Rs.600. He sold $\frac{1}{4}$ of them at 5 percent loss. At what price should he sell the remaining books so as to gain 10% on the whole .

Q17. What is the least natural number which when divided by the number 3, 5, 6, 8 , 10 and 12 leaves in each case remainder 2 but when divided by 13 leave no remainder.

Q18. The value of a machine depreciates every year by 10% .what will be its value after 2 years if it present value is Rs.50000.

Q19. A square part has each side 50m. At each corner, there is a flower bed in the form of a quadrant of radius 7 m , as shown in figure. Find the area of



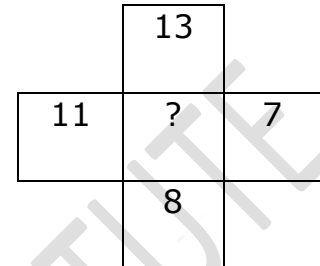
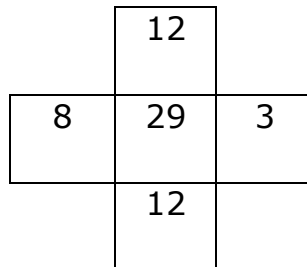
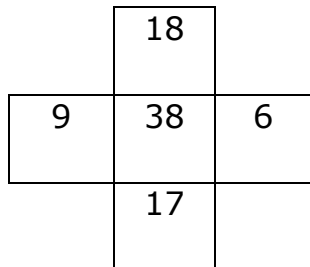


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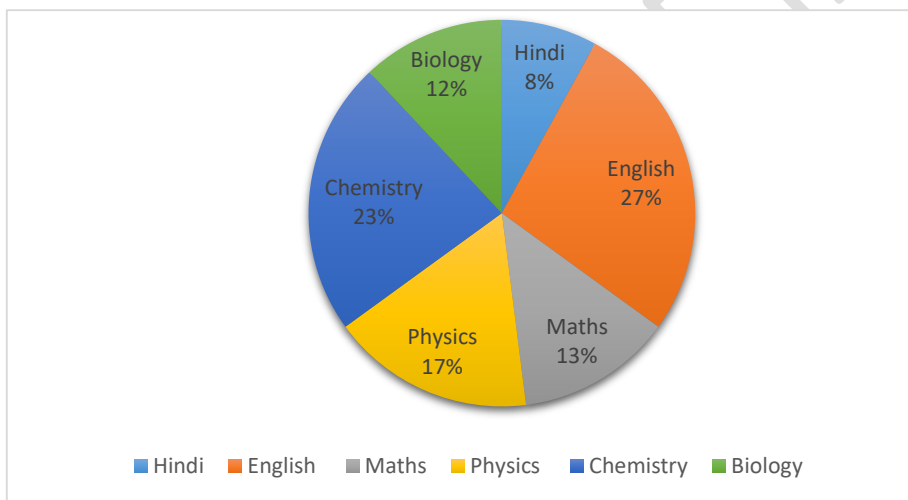
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Q20. Fill the question mark



PART B (10 X 10 =100 Marks)

Q21. The following pie chart represent a total number of 1800 teachers . If two ninth the teachers who teach physics is female , then number of male physics teachers is approximately what percent of the total number of teachers who teach the chemistry



Q22. A man borrowed a certain sum of money and paid it back in 2 years in two installments of Rs.3000 and Rs.2362.5 . If rate of compound interest was 5% payable annually. What sum did he borrow ?

Q23. A solid cylinder has total surface area of $463 m^2$. If its curved surface area is one third of its total surface area then find the volume of the cylinder.

Q24. A bucket of 15 liter then filled through a tap at the rate of 1 lit/min. After 5 minutes the bucket develops a crack with leakage rate of 10ml/sec. Find the time required to fill the bucket.



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Q25. Ajay denoted $\frac{1}{10}$ th of his money to a school, $\frac{1}{6}$ th of the remaining to a church and the remaining money he distributed equally between his two children. If each child gets Rs.75000, how much money did Ajay originally have ?

Q26. Om started a business by investing Rs.2,50,000. During the first three successive years, he earned a profit of 5% , 10% and 12% per annum respectively. If in each year the profit was added on the capital at the end of the previous year , calculate his total profit after 3 year .

Q27. If 7 men working 6 hrs a day take 12 days to complete a task , then how many days will 3 men working 8 hrs a day take to do the same work ?

Q28. Draw a pie chart of the data given below

Time spent by a child during a day :

Sleep – 8hrs

School – 6 hrs

Home-work-4 hrs

Play -4 hrs

Others – 2 hrs

Q29. Two pipes A and B can fill a tank in 24 min and 32 min respectively. Both the pipes are opened together. After how much pipe B should be closed so that the tank is full in 9 min ?

Q30. If $a + b + c = 0$, find the value of $\frac{1}{x^a + x^{-b} + 1} + \frac{1}{x^b + x^{-c} + 1} + \frac{1}{x^c + x^{-a} + 1}$

_____All the best _____