

**BACHELOR OF VOCATION**  
**Public Services**  
**Subject: Mathematics and Reasoning-I**  
**Subject Code: MAR-501**  
**Semester: First**  
**December 2021**  
**Theory (External): 70 Marks**  
**Time: 03 Hours**

**Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 2 marks.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 10 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number

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3. A company sells  $\frac{3}{4}$  of its total stock at 20% profit and the remaining 15% at profit. Find the profit percentage for the entire business.

4. If '+' means 'divided by', '-' means 'multiplied by', 'x' means 'minus' and '÷' means 'plus', simply the following expressions:

(a)  $16 \div 8 - 4 + 2 \times 4$

(b)  $36 \times 12 + 4 \div 6 + 2 - 3$

5. Simplify the following expression:

$$\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{4}} + \frac{1}{\sqrt{4}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{9}}$$

6. Fill in the blanks in the following series:

(i) ab \_ bca \_ ab \_

(ii) h \_ eg \_ fegh \_ eghfe

7. Find the missing number in the following tables:

(i)

4	11	7
3	8	5
5	2	3
72	197	?

(ii)

6	22	4
12	40	4
9	?	6

8. Fill in the blanks in the following:

(i)  $7:17:: -:50$

(ii)  $2:5::7:-$

===END OF PAPER===

**SECTION A (SHORT/OBJECTIVE TYPE QUESTIONS)**  
(10 x 2 = 20 Marks)

- A. The value of  $\sqrt{6724} =$   
(a) 82 (c) 84  
(b) 83 (d) 87
- B. The cost price of 20 articles is the same as the selling price of x articles. If the price of 25%, then the value of x is  
(a) 15 (c) 18  
(b) 16 (d) 25
- C. A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?  
(a) 3.6 (c) 8.4  
(b) 7.2 (d) 10
- D.  $-10 \div 2 =$   
(a) 5 (c) -2  
(b) -5 (d) 2
- E. Two men start together to walk a certain distance, one at 4 km/h and another at 3km/h. The former arrives half an hour before the latter. Then the distance  
(a) 6km  
(b) 9km  
(c) 8 km  
(d) 7km
- F. Find the LCM of  $21x^2y$ ,  $28xy^2$   
(a)  $7xy$   
(b)  $7x^2y$   
(c)  $7xy^2$   
(d)  $7x^2y^2$

- G. If  $2*3 = \sqrt{13}$  and  $3*4 = 5$ , then the value of  $5*12$  is  
(a) 17  
(b)  $\sqrt{29}$   
(c) 21  
(d) 13

- H. In a certain language, CAP is as 61, how will PEN be coded?  
(a) 40  
(b) 66  
(c) 80  
(d) 46

- I. How many 5's are there in the following sequence which are immediately followed by 3 but not immediately preceded by 7?  
8 9 5 3 2 5 3 8 5 5 6 8 7 3 3 5 7 7 5 3 6 5 3 3 5 7 3 8  
(a) One (c) Three  
(b) Two (d) Four

- J.  $4 : 64 :: 2 : ?$   
(a) 16 (c) 22  
(b) 8 (d) 12

**SECTION B (ESSAY TYPE QUESTIONS)**  
(5 X 10 = 50 Marks)

1. If a certain sum of money becomes 3 times of itself in 8 years. In how much times it will become 243 times of itself?
2. Find out the largest number of four digits, which divide by 15, 18, 21 and 24, respectively, leave the remainder 11, 14, 17 and 20, respectively.