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Course: B.Voc Program: Public Services

Subject: Mathematics and Reasoning -II, Code MAR 601

Semester: III

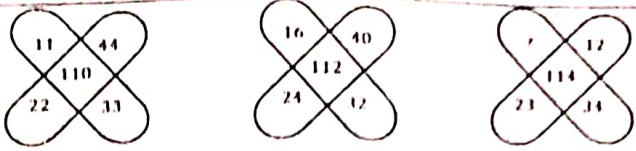
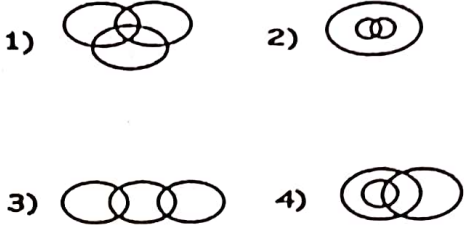
Time: 03 Hours

Max Mark: 70

**Instructions to the Students:**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of short answer type. All questions are compulsory. Each question carries 02 marks.
3. Section B comprises 8 long answer type questions out of which students must attempt any 5. Each question carries 10 marks.
4. Do not write anything on the question paper.

Q. No.	SECTION -A (SHORT ANSWER TYPE QUESTIONS)	Marks
1. A	A pipe can fill a tank in 15 hours. Due to a leak in the bottom, it is filled in 20 hours. If the tank is full, how much time will the leak take to empty it?	(2)
B	A and B together can do a piece of work in 6 days and A alone can do it in 9 days. In how many days can B alone do it?	(2)
C	A man walking with a speed of 5 km/hr reaches his target 5 minutes late. If he walks at a speed of 6 km/hr, he reaches on time. Find the distance of his target from his house?	(2)
D	A man swims downstream 30 km and upstream 18 km, taking 3 hrs each time. What is the velocity of stream?	(2)
E	What should be subtracted from $27x^3 - 9x^2 - 6x - 5$ to make it exactly divisible by $(3x - 1)$	(2)
F	Find the HCF of $20x^3y$ , $35xy^2$ ?	(2)
G	One morning Raj and Kamal were talking to each other face to face at a crossing. If Kamal's shadow was exactly to the left of Raj, which direction was Raj facing?	(2)
H	If Q means 'add to', J means 'multiply by', T means 'subtract from' and K means 'divide by', then find the value of $26 K 2 Q 3 J 6 T 4 - ?$	(2)

I	<p>The missing number is:</p> <p>a) 45 b) 65 c) 85 d) 95</p> 	(2)
J	<p>Which of the following Venn- diagram correctly illustrates the relationship among the classes: <i>Tennis fans</i>, <i>Cricket players</i>, <i>Students</i></p> <p>a) 1 b) 2 c) 3 d) 4</p> 	(2)
<b>Q. No.</b>	<b>SECTION –B (LONG ANSWER TYPE QUESTIONS)</b>	<b>Marks</b>
2.	<p>A, B and C are three pipes connected to a tank. A and B together fill the tank in 6 hours. B and C together fill the tank in 10 hours. A and C together fill the tank in 7.5 hours. In how much time will A, B and C fill the tank separately?</p>	(10)
3.	<p>Evaluate:</p> <p>(a). <math>\frac{7}{3+\sqrt{2}}</math> (b). <math>\frac{\sqrt{5}+1}{\sqrt{5}-1}</math> (c). <math>\frac{2+\sqrt{3}}{2-\sqrt{3}}</math> (d). <math>\frac{4+\sqrt{2}}{\sqrt{2}+1}</math> (e). <math>\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}</math></p>	(10)
4.	<p>Two trains can run at the speed of 54 km/hr and 36 km/hr respectively on parallel tracks. When they are running in opposite directions they pass each other in 10 seconds. When they are running in the same direction, a person sitting in the faster train observes that he passes the other train in 30 seconds. Find the length of the trains?</p>	(10)

5.	<p>In the question, two statements are given, followed by two conclusions, I and II. You have to consider the statements to be true even if it seems to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.</p> <p>a). Statements:          No cities are countries.          No countries are villages.          Conclusions:          I. Some countries are city.          II. No villages are city.</p> <p>b). Statements :          All cups are pencils.          Some pencils are pens.          Conclusions :          I. Some pencils are cups.          II. No pencil are cups.          III. Some cups are pens.</p>	(10)
6.	1 man or 2 women or 3 boys can do a work in 44 days. Then in how many days' will 1 man, 1 woman and 1 boys do the work?	(10)
7.	Some people were asked whether they like strawberry ice cream or chocolate ice cream. 82% said they like strawberry ice cream and 70% said they like chocolate ice cream. 4% said they like neither. By putting this information onto a Venn diagram, find the percentage of people who like both strawberry and chocolate ice cream.	(10)
8.	<p>If + stands for division; <math>\times</math> stands for addition; <math>-</math> stands for multiplication; <math>\div</math> stands for subtraction, Simply the following equations?</p> <p>a) <math>25 \div 5 \times 3 - 9 + 3</math>          b) <math>25 \times 5 + 3 - 9 \div 3</math>          c) <math>25 + 5 - 3 \div 9 \times 3</math>          d) <math>25 - 5 + 3 \times 9 \div 3</math></p>	(10)
9.	J, K, L, M, N, O, P and R are eight huts. L is 2 km east of K. J is 1 km north of K and Q is 2 km south of J. P is 1 km west of Q while M is 3 km east of P and O is 2 km north of P. R is situated right in the middle of K and L while N is just in the middle of Q and M. Find the distance between K & P and K & R ?	(10)

==END OF PAPER==