Assignment-1

EE:1205 Signals and System
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I. Question 11.9.2 - 2

Find the sum of all natural numbers lying between 100 and 1000, which are multiples of 5.

II. Solution

The natural numbers lying between 100 and 1000,which are multiples of 5, are 105,110,.....,995.

Here

$$a = 105 \tag{1}$$
$$d = 5 \tag{2}$$

$$a_n = a + (n-1)d \tag{3}$$

From (3)

$$105 + (n-1)5 = 995 \tag{4}$$
$$(n-1)5 = 995 - 105 = 890 \tag{5}$$
$$n - 1 = 178 \tag{6}$$
$$n = 179 \tag{7}$$

$$S_n = \frac{n}{2}[2a + (n-1)d] \tag{8}$$

From (8)

$$\therefore S_n = \frac{179}{2}[2(105) + (179-1)(5)] \tag{9}$$
$$= \frac{179}{2}[2(105) + (178)(5)] \tag{10}$$
$$= 179[105 + (89)5] \tag{11}$$
$$= (179)(105 + 445) \tag{12}$$
$$= (179)(550) \tag{13}$$
$$= 98450 \tag{14}$$

Thus, the sum of all natural numbers lying between 100 and 1000,which are multiples of 5,is 98450.