

NAME ✕ MUZAMIL

Roll NO ✕ 20P-0108

TASK ✕ 06

Task 1:

$$S \rightarrow aSa / bSb / a / b / \lambda.$$

Task 2:

$$S \rightarrow A S_1$$

$$A \rightarrow aA / \lambda$$

$$S_1 \rightarrow bS_1c / \lambda$$

Task: 3

$$S \rightarrow S_1 C_1$$

$$C_1 \rightarrow cC_1 / \lambda$$

$$S_1 \rightarrow aS_1b / \lambda$$

Task: 4

$S_1 \rightarrow 0S_1 / 0$   
 $S_2 \rightarrow 1S_1 / 1$   
 $S \rightarrow S_1 S_2$

Task 5:

$S \rightarrow AB / AAB$   
 $A \rightarrow 0|1|2|3|4|5|6|7|8|9$   
 $B \rightarrow 0|2|4|6|8.$

$B \rightarrow$  generates even

$A -$  generates all from 0-9.

Task 6:

$$(ab)^n \mid n \geq 0$$

$$S \rightarrow abS \mid \lambda$$

Task 7:

$$S_1 \rightarrow aS_1 \mid a$$

$$S_2 \rightarrow bS_2 \mid b$$

$$S_3 \rightarrow cS_3 \mid c$$

$$S \rightarrow S_1S_2S_3$$

Task 8:

$$S_1 \rightarrow 0S_1 / \lambda$$

$$S_2 \rightarrow 1$$

$$S_4 \rightarrow 0S_3 / 1S_3 / \lambda$$

$$S_5 \rightarrow S_1 S_2 S_4$$

Task 9:

$$S \rightarrow aSb / bSa / SS / \lambda$$

Task 10:

$$S \rightarrow 0 S_{11} SC / \lambda$$

Task 11:

$$S \rightarrow 0S_1 / 000$$

Task 12:

for  $n=1$

$$S_1 \Rightarrow 0$$

$S_2 \longrightarrow \text{II} / \text{III}$

$S \longrightarrow S_1 \quad S_2$