

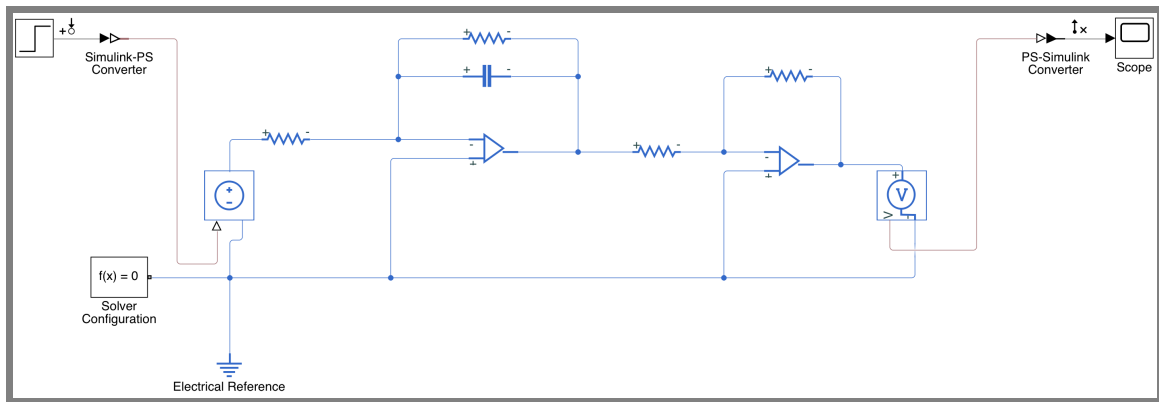
ControlSystems Lab4

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Answers-

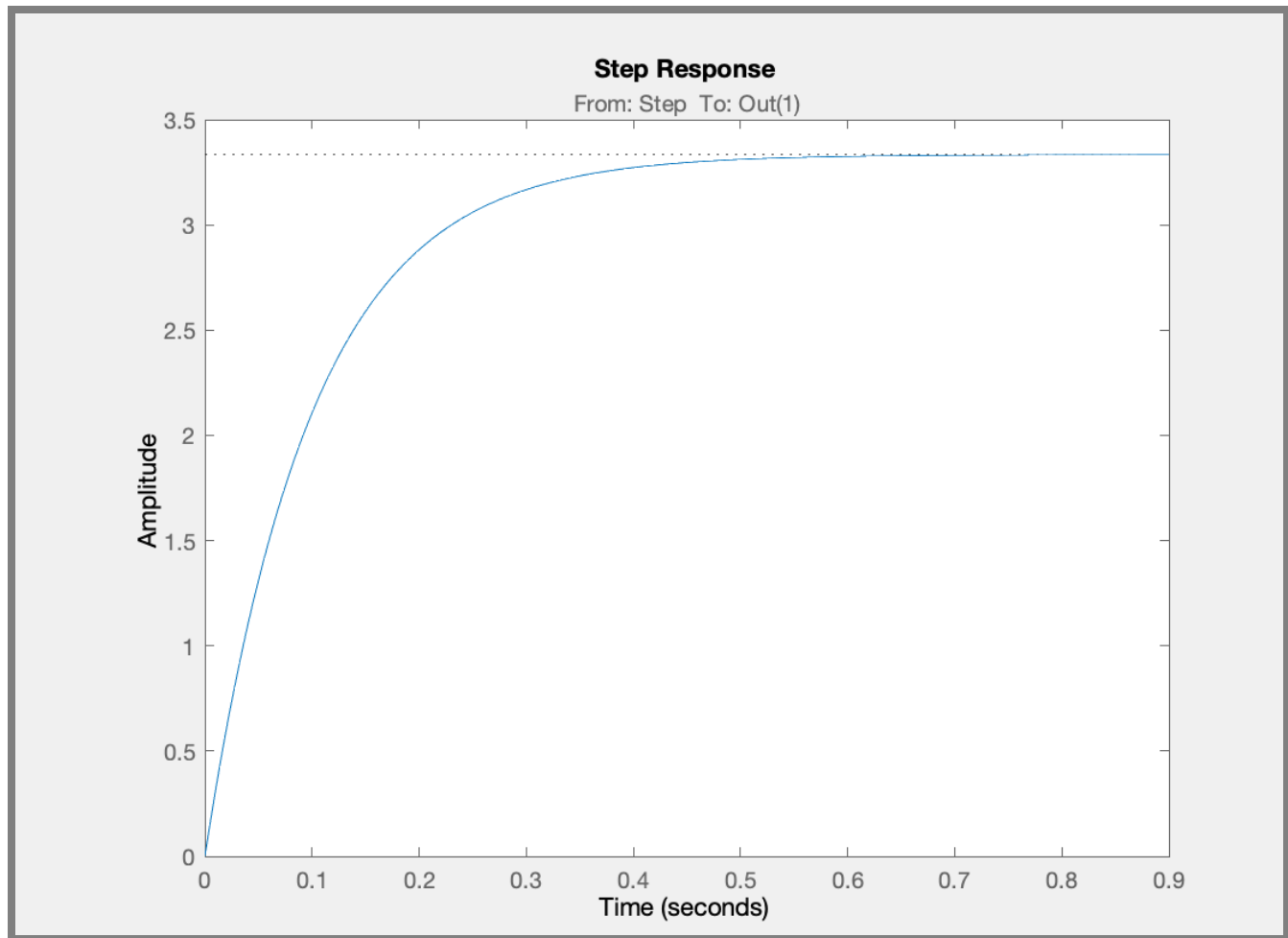
Q2-



Code-

```
1 %% Exact linearization of the Simulink model Lab4_Q2
2 %
3 % This MATLAB script is the command line equivalent of the exact
4 % linearization tab in linear analysis tool with current settings.
5 % It produces the exact same linearization results as hitting the Linearize button.
6
7 % MATLAB(R) file generated by MATLAB(R) 9.9 and Simulink Control Design (TM) 5.6.
8 %
9 % Generated on: 29-Jan-2021 09:58:47
10
11 %% Specify the model name
12 model = 'Lab4_Q2';
13
14 %% Specify the analysis I/Os
15 % Get the analysis I/Os from the model
16 io = getlinio(model);
17
18 %% Specify the operating point
19 % Use the model initial condition
20 op = operpoint(model);
21
22
23 %% Linearize the model
24 sys = linearize(model,io,op);
25
26 %% Plot the resulting linearization
27 stepinfo(sys)
28 tf(sys)
29 step(6*sys)
```

Output Plot-



Time domain characteristics and transfer function from code-

RiseTime: 0.2197
SettlingTime: 0.3912
SettlingMin: 3.0150
SettlingMax: 3.3332
Overshoot: 0
Undershoot: 0
Peak: 3.3332
PeakTime: 1.0546

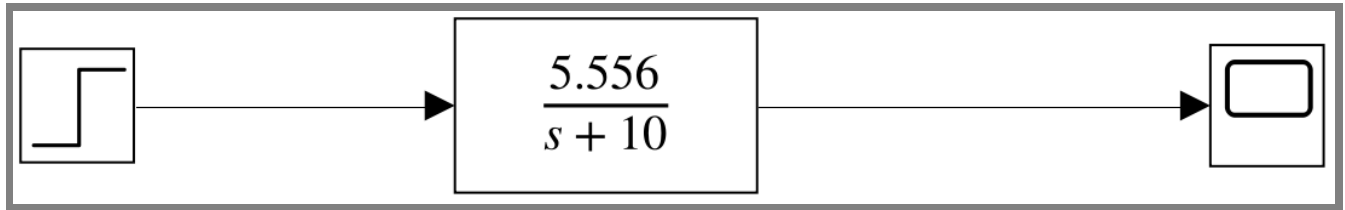
From input "Step" to output "PS-Simulink Converter":
 $5.556e-08 s + 5.556$

$s + 10$

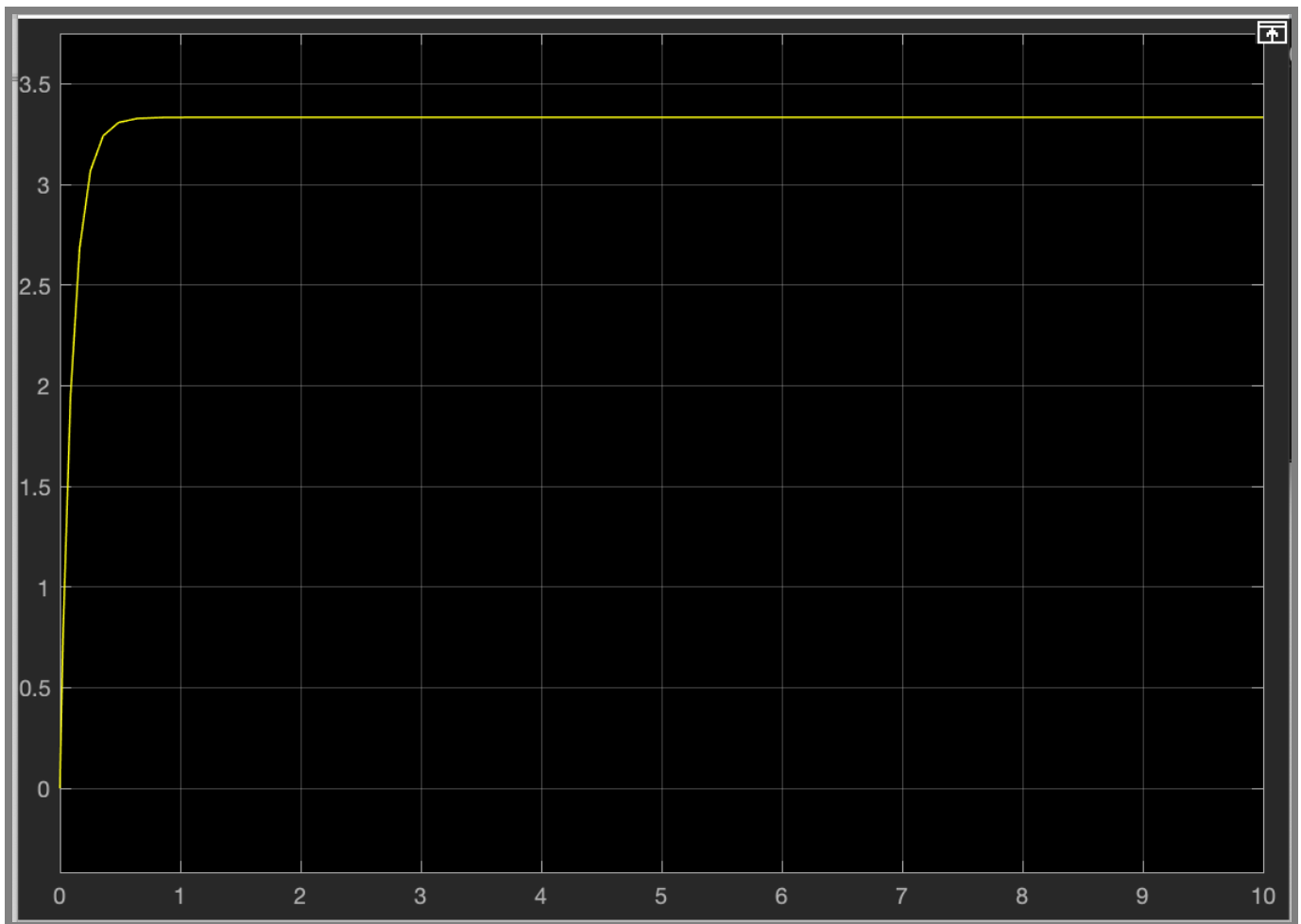
As in numerator coefficient of s is very small so transfer function-

$$T(s) = \frac{5.556}{s + 10}$$

Simulink for above transfer function-



Output from scope-



We can compare both the plots and get the conclusion that they are same.