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**MATRIC NO: 16/ENG02/001**

**ENG 382**

## **QUESTION 2 SOLUTION**

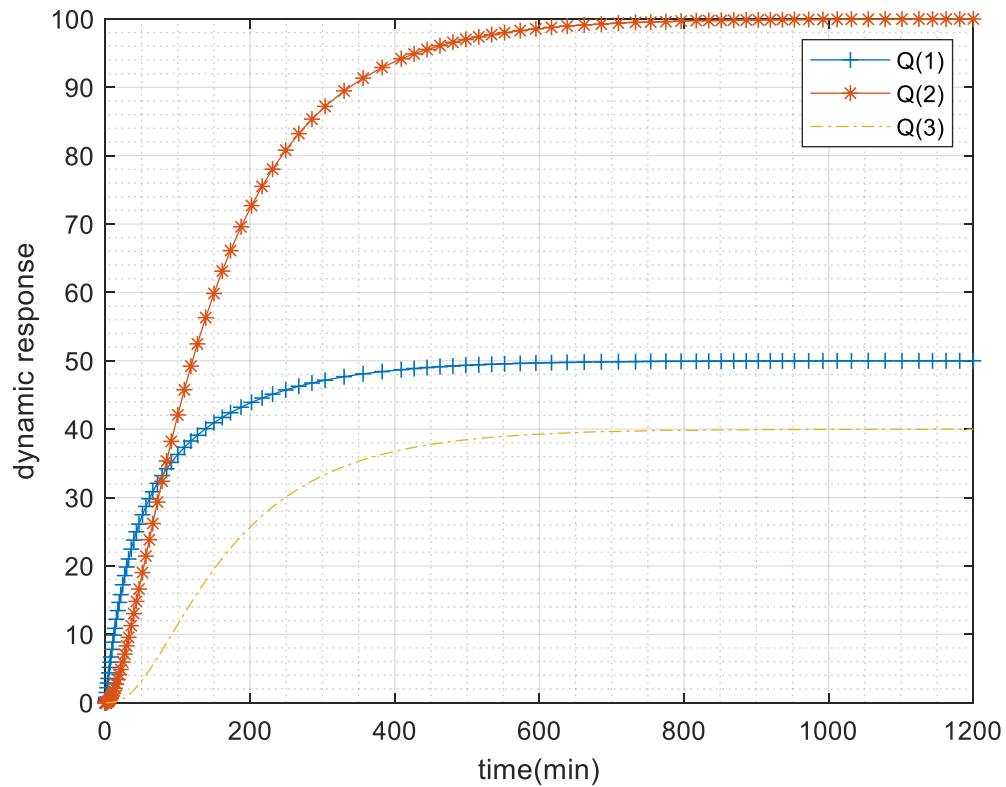
### **Matlab codes**

```
Function uche =abas(t,Q)
%ap=[Q1;Q2;Q3]
abas(1,1)=(-15/500)*Q(1)+(5/1000)*Q(2)+1;
abas(2,1)=(15/500)*Q(1)-(18/1000)*Q(2)+(3/400)*Q(3);
abas(3,1)=(13/1000)*Q(2)-(13/400)*Q(3);
```

### **Code written in the command window**

```
>> [t,Qv]=ode45('uche',[0 1200],[0;0;0]),
plot(t,Qv(:,1),'+-',t,Qv(:,2),'*-',t,Qv(:,3),'-.'),
legend('Q(1)','Q(2)','Q(3)'),
grid on,
grid minor,
xlabel('time(min)'),
ylabel('dynamic response')
```

### Graph obtained



### Steady state values

For Q(1): From the graph above the steady state value is 100.

For Q(2): From the graph above the steady state value is 50.

For Q(3): From the graph above the steady state value is 40.