

The answer of Question 2

1 Question 8.1

- For concentration S, $\frac{d[S]}{dt} = -k_1 \times [S][E] + k_2 \times [ES]$
- For concentration P, $\frac{d[P]}{dt} = k_3 \times [ES]$
- For concentration E, $\frac{d[E]}{dt} = -k_1 \times [S][E] + (k_2 + k_3) \times [ES]$
- For concentration ES, $\frac{d[ES]}{dt} = k_1 \times [S][E] - (k_2 + k_3) \times [ES]$

2 Question 8.2

The m.file of the code is attached. And I will put the code below as well.

Equ.m

```
function dy=equations(t,y,flag,k1,k2,k3)
e=1;s=10;es=0;p=0;
yzero=[1,10,0,0];
k1=100;k2=600;k3=150;
tspan=[0,1000];
dy=[-k1*s*e+k2*es
    (k2+k3)*es*es-k1*s*e
    k1*s*e-(k2+k3)*es*es]
    k3*es;
end
[t,y]=ode45(dy,tspan,yzero,[],k1,k2,k3);
```

