

Application No. C2104857

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Question No.: 8

8.1

We have known  $E + S \xrightleftharpoons[k_2]{k_1} ES \xrightarrow{k_3} E + P$

Rate of changes of E :  $R_E = -k_1 ES + (k_1 + k_2) ES$

Rate of changes of S :  $R_S = -k_1 ES + k_2 ES$

Rate of changes of ES :  $R_{ES} = k_1 ES - (k_2 + k_3) ES$

Rate of changes of P :  $R_P = k_3 ES$

8.3

$$E_t = E_f + ES$$

$$ES = 0 \Rightarrow k_1 ES = (k_2 + k_3) ES$$

$$\Rightarrow k_1 (E_{\text{total}} - ES) ES$$

$$= k_2 + k_3 ES$$

$$\Rightarrow ES = \frac{E_t \cdot S}{\frac{k_2 + k_3}{k_1} + S}$$

$$R_P = k_3 ES = \frac{k_3 E_{\text{total}} S}{\frac{k_2 + k_3}{k_1} + S}$$

$$R_{\text{max}} = k_3 E_t$$

$$k_1 = 100 \mu\text{m}/\text{min}$$

$$k_2 = 600 \mu\text{m}/\text{min}$$

$$k_3 = 150/\text{min}$$

$$E_t = 1 \mu\text{m}$$

$$R_{\text{max}} = 150 \mu/\text{min}$$

