Question 2

Law of mass action states that

At Constant Temperature, the rate of chemical reaction is directly proportional to the product of the activities or concentrations of the reactants.

(8.1)

According to law of mass action,

Rate of forward reaction α [E] [S]

$$= K_1 [E] [S]$$

Rate of reverse reaction α [E_S]

$$= K_2 [E_S]$$

At equilibrium state,
Rate of forward reaction = Rate of reverse reaction
$K_1 [E] [S] = K_2 [E_S]$
$K_1 / K_2 = K_C = [E_S] / [E] [S]$

$K_C = [E_S] / [E] [S]$

According to Law of mass action,

$K_C = [E] [P] / [E_S]$