2. **Version A** (a) Proportion defective = 0.05
Let X = no. of defectives in a sample of 40, X ~ Bin(x; n = 40, p = 0.05)
P(accepting the box) = P(X is no more than 1) = P(X = 0) + P(X = 1)

$$= 0.95^{40} + (40)\,0.95^{39}\,(0.05)$$
$$= 0.1285 + 0.2706 = 0.3991$$

(b) Proportion defective = 0.1
Let X = no. of defectives in a sample of 40, X ~ Bin(x; n = 40, p = 0.1)
P(accepting the box) = P(X is no more than 1) = P(X = 0) + P(X = 1)

$$= 0.9^{40} + (40)\,0.9^{39}\,(0.1)$$
$$= 0.0148 + 0.0657 = 0.0805$$

P(rejecting the box) = 1 - P(accepting the box) = 1 – 0.0805 = 0.9195

2. **Version B** (a) Proportion defective = 0.07
Let X = no. of defectives in a sample of 40, X ~ Bin(x; n = 40, p = 0.07)
P(accepting the box) = P(X is no more than 1) = P(X = 0) + P(X = 1)

$$= 0.93^{40} + (40)\,0.93^{39}\,(0.07)$$
$$= 0.0549 + 0.1652 = 0.2201$$

(b) Proportion defective = 0.14
Let X = no. of defectives in a sample of 40, X ~ Bin(x; n = 40, p = 0.14)
P(accepting the box) = P(X is no more than 1) = P(X = 0) + P(X = 1)

$$= 0.86^{40} + (40)\,0.86^{39}\,(0.14)$$
$$= 0.0024 + 0.0156 = 0.0180$$

P(rejecting the box) = 1 - P(accepting the box) = 1 – 0.0180 = 0.9820