

## Additional Exercises for Chapter 2 with SOLUTIONS

Given the following signature

$$\mathcal{O} = \{a, b\}$$

$$\mathcal{F} = \{\}$$

$$\mathcal{P} = \{p, q\}$$

$$\mathcal{V} = \{X\}$$

find the answer sets (if any) for the following ASP programs:

1.  $p(a).$   
 $q(b).$   
 $q(X) \leftarrow p(X).$

$$A = \{p(a), q(a), q(b)\}$$

2.  $p(a).$   
 $p(b).$   
 $q(X) \leftarrow p(X).$

$$A = \{p(a), p(b), q(a), q(b)\}$$

3.  $p(a) \text{ or } p(b).$   
 $q(X) \leftarrow p(X).$

$$A_1 = \{p(a), q(a)\}$$

$$A_2 = \{p(b), q(b)\}$$

4.  $p(a) \text{ or } \neg p(b).$   
 $q(X) \leftarrow p(X).$

$$A_1 = \{p(a), q(a)\}$$

$$A_2 = \{\neg p(b)\}$$

5.  $p(a)$ .  
 $p(b)$ .  
 $q(X) \leftarrow p(X)$ .  
 $\leftarrow q(a)$ .

No answer set.

6.  $p(a)$  or  $p(b)$ .  
 $q(X) \leftarrow p(X)$ .  
 $\leftarrow q(a)$ .

$A = \{p(b), q(b)\}$

7.  $p(a)$  or  $p(b)$ .  
 $p(a) \leftarrow p(b)$ .

$A = \{p(a)\}$