**ASSIGNMENT #1**

**­Question 1**

1. The FSP for each process is in the file “Question 1/Question 1.txt”.

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FSP for process P1 in Question 1 Assignment 1

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P1 = A,

A = (a -> B | a -> D),

B = (b -> C | c -> D),

C = (a -> D | b -> A | d -> C),

D = (d -> A).

Diagram

Description automatically generated

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FSP for process P2 in Question 1 Assignment 1

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P2 = A,

A = (b -> B | b -> C),

B = (b -> E | d -> D),

C = (c -> B),

D = (a -> A | b -> E | d -> C),

E = (a -> A | c -> C).

Diagram

Description automatically generated

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FSP process P3 in Question 1 Assignment 1

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P3 = A,

A = (a -> D | b -> B),

B = (a -> A | a -> C),

C = (b -> B | b -> D | c -> C),

D = (a -> C | c -> A).

Diagram

Description automatically generated

1. The general labelled transition systems may look different to the given graphs at first, but after rearranging the nodes (the states) in the generated labelled transition systems, they will be the same as the given corresponding graphs.
   1. Process P1: The states A, B, C, D in the given graph correspond to the states 0, 2, 3, 1 in the labelled transition system
   2. Process P2: The states A, B, C, D in the given graph correspond to the states 0, 2, 1, 3, 4
   3. Process P3: The states A, B, C, D in the given graph correspond to the states 0, 1, 2, 3

**Question 2**

SYSTEM = START,

START = (room\_request -> AVAILABLE

|room\_request -> UNAVAILABLE),

AVAILABLE = (send\_confirmation -> USE

|send\_confirmation -> CANCEL),

UNAVAILABLE = (reserve -> AVAILABLE

|reserve -> CANCEL),

USE = (use -> STOP),

CANCEL = (cancel -> STOP).

Diagram

Description automatically generated

**Question 3**

RADIO = OFF,

OFF = (on -> TOP),

TOP = (off -> OFF

|reset -> TOP

|scan -> SCANNING),

SCANNING = (off -> OFF

|reset -> TOP

|lock -> STATION

|end -> BOTTOM),

STATION = (off -> OFF

|reset -> TOP

|scan -> SCANNING),

BOTTOM = (off -> OFF

|reset -> TOP).

Diagram

Description automatically generated

**Question 6**

A = (a -> A1 | c -> D | c -> C),

B = (b -> E2),

C = (a -> B2 | a -> C),

A1 = (b -> A),

B1 = (c -> B),

D = (a -> C | c -> B),

E1 = (a -> A | b -> B),

E2 = (a -> B | c -> E1),

B2 = (b -> B1).