EXPERIMENT 1

CODE 1 :

```python
import random as rn

class Environment:
    def __init__(self):
        self.state = 0

    def reset(self):
        self.state = 0
        return self.state

    def step(self, action):
        self.state += action
        if self.state == 5:
            reward = 10
            done = True
        else:
            reward = 0
            done = False
        return self.state, reward, done


class Agent:
    def __init__(self):
        self.action = [-1, 1]

    def select_action(self):
        return rn.choice(self.action)


env = Environment()
agent = Agent()

state = env.reset()
done = False
step_count = 0

print("Starting Episode...")

while not done:
    action = agent.select_action()
    next_state, reward, done = env.step(action)
    print(f"Step {step_count} State: {state}, Reward: {reward}, Done: {done}")
    state = next_state
    step_count += 1

print("Episode Finished!")
```

OUTPUT:

```
Starting episode
Step: 0,State: 0, Action: -1, Next state: -1, Reward: 0
Step: 1,State: -1, Action: 1, Next state: 0, Reward: 0
Step: 2,State: 0, Action: 1, Next state: 1, Reward: 0
Step: 3,State: 1, Action: 1, Next state: 2, Reward: 0
Step: 4,State: 2, Action: 1, Next state: 3, Reward: 0
Step: 5,State: 3, Action: 1, Next state: 4, Reward: 0
Step: 6,State: 4, Action: 1, Next state: 5, Reward: 10
Episode finished
```

CODE 2:

```python
import random as rn

class Environment:
  def __init__(self):
    self.state = 0

  def reset(self):
    self.state = 0
    return self.state

  def step(self, action):
    self.state += action
    if self.state == 10:
      reward = 20
      done = True
    elif self.state == 5:
      reward = -5
      done = False
    else:
      reward = 0
      done = False
    return self.state, reward, done


class Agent:
  def __init__(self):
    self.action = [-1, 1]

  def select_action(self):
    return rn.choice(self.action)
```

```python
env = Environment()
agent = Agent()

state = env.reset()
done = False
step_count = 0

print("Starting Episode...")

while not done:
  action = agent.select_action()
  next_state, reward, done = env.step(action)
  print(f"Step {step_count} State: {state}, Reward: {reward}, Done: {done}")
  state = next_state
  step_count += 1

print("Episode Finished!")
```

OUTPUT:

```
Starting Episode...
Step 0 State: 0, Reward: 0, Done: False
Step 1 State: 1, Reward: 0, Done: False
Step 2 State: 2, Reward: 0, Done: False
Step 3 State: 1, Reward: 0, Done: False
Step 4 State: 2, Reward: 0, Done: False
Step 5 State: 3, Reward: 0, Done: False
Step 6 State: 2, Reward: 0, Done: False
Step 7 State: 1, Reward: 0, Done: False
Step 8 State: 0, Reward: 0, Done: False
Step 9 State: -1, Reward: 0, Done: False
Step 10 State: 0, Reward: 0, Done: False
Step 11 State: 1, Reward: 0, Done: False
Step 12 State: 2, Reward: 0, Done: False
Step 13 State: 1, Reward: 0, Done: False
Step 14 State: 0, Reward: 0, Done: False
Step 15 State: 1, Reward: 0, Done: False
Step 16 State: 2, Reward: 0, Done: False
Step 17 State: 3, Reward: 0, Done: False
Step 18 State: 2, Reward: 0, Done: False
Step 19 State: 1, Reward: 0, Done: False
Step 20 State: 2, Reward: 0, Done: False
Step 21 State: 3, Reward: 0, Done: False
Step 22 State: 4, Reward: 0, Done: False
Step 23 State: 3, Reward: 0, Done: False
Step 24 State: 2, Reward: 0, Done: False
Step 25 State: 3, Reward: 0, Done: False
Step 26 State: 2, Reward: 0, Done: False
Step 27 State: 1, Reward: 0, Done: False
Step 28 State: 2, Reward: 0, Done: False
Step 29 State: 1, Reward: 0, Done: False
Step 30 State: 2, Reward: 0, Done: False
Step 31 State: 3, Reward: 0, Done: False
Step 32 State: 2, Reward: 0, Done: False
Step 33 State: 1, Reward: 0, Done: False
Step 34 State: 0, Reward: 0, Done: False
Step 35 State: -1, Reward: 0, Done: False
Step 36 State: 0, Reward: 0, Done: False
Step 37 State: -1, Reward: 0, Done: False
Step 38 State: 0, Reward: 0, Done: False
Step 39 State: 1, Reward: 0, Done: False
```

```
Step 40 State: 0, Reward: 0, Done: False
Step 41 State: 1, Reward: 0, Done: False
Step 42 State: 2, Reward: 0, Done: False
Step 43 State: 1, Reward: 0, Done: False
Step 44 State: 2, Reward: 0, Done: False
Step 45 State: 1, Reward: 0, Done: False
Step 46 State: 2, Reward: 0, Done: False
Step 47 State: 1, Reward: 0, Done: False
Step 48 State: 2, Reward: 0, Done: False
Step 49 State: 3, Reward: 0, Done: False
Step 50 State: 4, Reward: 0, Done: False
Step 51 State: 3, Reward: 0, Done: False
Step 52 State: 4, Reward: 0, Done: False
Step 53 State: 3, Reward: 0, Done: False
Step 54 State: 2, Reward: 0, Done: False
Step 55 State: 3, Reward: 0, Done: False
Step 56 State: 4, Reward: -5, Done: False
Step 57 State: 5, Reward: 0, Done: False
Step 58 State: 6, Reward: 0, Done: False
Step 59 State: 7, Reward: 0, Done: False
Step 60 State: 6, Reward: -5, Done: False
Step 61 State: 5, Reward: 0, Done: False
Step 62 State: 4, Reward: -5, Done: False
Step 63 State: 5, Reward: 0, Done: False
Step 64 State: 4, Reward: 0, Done: False
Step 65 State: 3, Reward: 0, Done: False
Step 66 State: 4, Reward: -5, Done: False
Step 67 State: 5, Reward: 0, Done: False
Step 68 State: 4, Reward: -5, Done: False
Step 69 State: 5, Reward: 0, Done: False
Step 70 State: 4, Reward: -5, Done: False
Step 71 State: 5, Reward: 0, Done: False
Step 72 State: 4, Reward: 0, Done: False
Step 73 State: 3, Reward: 0, Done: False
Step 74 State: 4, Reward: -5, Done: False
Step 75 State: 5, Reward: 0, Done: False
Step 76 State: 6, Reward: -5, Done: False
Step 77 State: 5, Reward: 0, Done: False
Step 78 State: 6, Reward: -5, Done: False
Step 79 State: 5, Reward: 0, Done: False
Step 80 State: 6, Reward: 0, Done: False
Step 81 State: 7, Reward: 0, Done: False
Step 82 State: 8, Reward: 0, Done: False
Step 83 State: 9, Reward: 20, Done: True
Episode Finished!
```