**Business Modelling 6 Simulating reality**

1. Which of the following is not true? Simulation may be used when experimenting with the real system is:
   1. Too costly
   2. Too disruptive
   3. Too time consuming
   4. Too simple
2. Simulation often uses random numbers. In practice, how are these usually found?
   1. figures made-up by the person running the simulation
   2. tables of random digits
   3. a mechanical device, like a roulette wheel
   4. a computerised random number generator
3. Times indicating when a customer enters and leaves the system (or process within the system) are referred to as:
   1. Event times
   2. Inputs
   3. Outputs
   4. Constant times
4. Measurements collected from the simulation and used to calculate summary statistics are known as:
   1. Throughputs
   2. Outputs
   3. Inputs
   4. Primary indicators
5. If you use two-digit random numbers to generate random process durations, which of the following could you use to show that 35% of durations are of ten minutes?
   1. numbers 00 to 34 mean a duration of 10 minutes
   2. numbers 00 to 9 mean a duration of 10 minutes
   3. numbers 01 to 10 mean a duration of 35 minutes
   4. numbers 00 to 35 mean a duration of 10 minutes
6. The type of simulation that considers the system at regular time-points is called:
   1. Next-event time-advance
   2. New-stage time advance
   3. Fixed-increment time-advance
   4. Set-period time-advance
7. Why is a simulation often run for a while before recording data?
   1. To eliminate bias with the choice of initial conditions
   2. To ensure customer satisfaction
   3. To allow for staff training
   4. To enable sufficient stock to be purchased
8. The RAND function in Excel and other spreadsheets generates random numbers with which distribution?
   1. Binomial
   2. Poisson
   3. Uniform
   4. Normal
9. In a single-server queue, which of the following would usually be assumed?
   1. Service rate = arrival rate
   2. Service rate < arrival rate
   3. Service rate > arrival rate
   4. Service rate + arrival rate = 0
10. In a single queue the arrival rate is λ and the service rate is μ. What is the probability that the server is busy?
    1. λ/μ
    2. 1-λ
    3. 1/(μ-λ)
    4. λ2 / (μ(μ-1)

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| Question | Answer |
| 1 | D |
| 2 | D |
| 3 | A |
| 4 | B |
| 5 | A |
| 6 | C |
| 7 | A |
| 8 | C |
| 9 | C |
| 10 | A |