


<b>Name:</b>	
<b>Enrolment No:</b>	
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b>	
<b>End Semester Examination, May 2020</b>	
<b>Course:</b> Modelling and Simulation of Digital Systems	
<b>Semester: II</b>	
<b>Code: CSEG 7005</b>	
<b>Time: 10.00 AM – 1.00 PM</b>	
<b>Programme: M.Tech CSE</b>	
<b>Max. Marks: 100</b>	

### End Semester Open Book Exams

#### Instructions:

Duration max 3 Hrs

Q1 a) 20 Marks b) 20 marks c) 10

Q2. 20 marks

Q3. 20 marks

Q4. 30 marks

**Attempt any one of 2 or 3**

#### Question Title Question 1 (CO1, CO2, CO5)

Consider the problem statement: A Classroom is to be studied to identify whether the teaching and learning is appropriately and adequately done and moreover, whether what additions could be made to improve the learning outcomes. Generally, teaching and learning is measured in the means of outcomes that attained by an individual after attending a subject. A subject may include several class hrs. A course may be assigned few outcomes and the every class might address few outcomes through topics in the syllabi of the subject. A classroom is a place where the teaching mostly occurs (so far) and thus the learning is obtained/attained. It is thus vital to study the classroom as to how to ensure effectiveness into the overall teaching and learning.

- a) Using the concept of model building, build the structure of the model by
  - a. Identifying entities, attributes and activities.
  - b. Formulate a rough relation among them.
  - c. Write in 100 words how would you map this model onto a discrete event system.
- b) How would you identify various entities and their data distribution?
- c) Show how would you apply model Verification and Validation on your above model.

#### Question Title Question 2 (CO3, CO4)

Perform chi-square test to test the following random numbers in (0,9) for uniformity (find out only X0).

3,5,7,8,1,3,5,2,7,1,9,2,4,3,2,8,4,6,7, 3,5,7,8,1,3,5,2,7,1,9,2,4,3,2,8,4,6,7,

3,5,7,8,1,3,5,2,7,1,9,2,4,3,2,8,4,6,7

Show steps.

**Question Title Question 3 (CO3, CO4)**

Perform runs up and down test for independence for the following random numbers (find out only Z0).

0.8, 0.7, 0.53, 0.11, 0.95, 0.96, 0.73, 0.21, 0.44, 0.76, 0.3

Show steps.

**Question Title Question 4 (CO3, CO5)**

A given climate system has two random variables, X (days) and Y(temperature). The scientific readings recorded earlier gave following sets for the above variables.

X	50	59	57	65	68	55	56	59	61
Y	11	15	11.5	14	19	20	21	18	12

A model developed is represented as  $Z(\text{comfort})=X*Y/30$ . Use empirical continuous distribution to perform inverse transform and generate 2 variates for X and Y. Take U(0,1) random numbers as 0.356, 0.548.

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