

**B.Tech. - VIEP - ELECTRICAL ENGINEERING  
(BTELVI)**

**00969** Term-End Examination

**December, 2017**

**BIEEE-001 : DYNAMIC SYSTEM SIMULATION**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any seven questions. Each question carries equal marks. Use of scientific calculator is allowed.*

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1. How are scalar MATLAB functions different from vector MATLAB functions ? List the commonly used scalar functions with examples. 10
  
2. Write down the commands for the following functions in MATLAB. Also write the results after execution of the commands : 10
  - (a) Creating a matrix of ones of 5 by 5.
  - (b) Creating a randomly generated matrix of 5 by 4.

3. Two polynomials are given as

$$P_1 = x^5 - 3x^4 + 5x^2 + 7x + 9, \text{ and}$$

$$P_2 = 2x^6 - 8x^4 + 4x^2 + 10x + 12.$$

Compute the product  $p_1 \cdot p_2$  using `conv(a, b)` function in MATLAB.

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4. Develop a SIMULINK model of an electromechanical system using transfer function models. Explain in detail, the block sets used.

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5. Using MATLAB commands and SIMULINK, develop the generalized machine model for an induction motor. Explain the block sets used to graphically display speed - torque characteristics.

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6. Explain each step for modelling and simulation of a multilevel inverter for an induction motor drive. Explain each block set used.

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7. What are Markovian models ? Discuss steady-state behaviour of infinite population Markov models.

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8. What are Queueing models ? What are the general characteristics of a queueing system ? How does simulation estimate the mean measures of performance ?

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**9. Write short notes on any *two* of the following :** ***2×5=10***

- (a) Simulation of Auto Regressive Moving Average (ARMA) Processes**
  - (b) Simulation of Pneumatic System**
  - (c) Steady-State Behaviour of Finite Population Models**
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