Seat No.:	Enrolment No.

## GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2170310 Date: 04/05/2017 **Subject Name: Introduction to Virtual Biomedical Instrumentation(Department Elective - I)** Time: 02.30 PM to 05.00 PM **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. **Q.1** (a) Define Virtual Instrumentation system and give advantages of Virtual **07** Instruments over conventional instruments. **(b)** Explain the process of analog to digital conversion with necessary diagrams. 07 **Q.2** What is functional integration? Discuss various types of approaches for 07 (a) functional integration. (b) Enlist and explain various standard wireless interfaces. 07 OR (b) Enlist and explain various standard wired serial interfaces. **07** Q.3 Classify presentation and control interfaces and explain each in detail. 07 **(b)** Explain the characteristics of different Types of smoothing window functions. 07 OR Enlist and describe various methods used for distributed communication 0.3 07 (a) system. (b) What is the prime importance of sensor calibration? Discuss the effects of 07 improper calibration with necessary examples. (a) Classify types of noises based on frequency or time characteristics. **07** 0.4 **(b)** Explain the characteristics of D-to-A converter. 07 (a) Write a brief note on virtual prototyping and its applications in Biomedical 0.4 **07** Engineering. (b) List the advantages and disadvantages of digital filters. **07** Explain the effects of aliasing and antialiasing filters with appropriate diagrams. **Q.5** 07 **(b)** Enlist and describe the factors affecting EMG signal measurement. 07 (a) Discuss the applications of 3D graphical modeling in Biomedical Engineering. 07 **Q.5** (b) Enlist and explain various types of noises and artifacts affecting ECG signal 07 during measurement.

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