Hall Ticket Number:

Code No. : 31326

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD

B.E. (ECE) III Year I-Semester Main & Backlog Examinations, December-2017

Electronic Instrumentation

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

1. Define and explain the difference between Resolution and Sensitivity with examples.
2. A voltmeter of range 500 V DC is specified with an accuracy of +/- 2% of full scale. Calculate the limiting error when the Instrument is required to measure 25 V DC.
3. Give classification on the types of transducer with examples.
4. A 600 ohm strain gauge with a gauge factor of 2.5 generate a resistance change of 1.5 ohms under stress. Find percentage strain that is applied.
5. Define Sound Pressure Level and Sound power Level. Why are they measured in dB?
6. Compare different temperature measurement principles.
7. What is the difference between Analog and digital Volt meters? Write on advantages of Digital Voltmeters.
8. Where is a delayed Time base Oscilloscope used and give an application?
9. What is Absolute refractory period and Relative refractory period for a cell? Explain using an Action potential diagram.
10. Compare MR imaging and Ultra sonic Imaging.

Part-B (5 × 10 = 50 Marks)

11. a) Discuss different types of error and explain which of them are eliminated or estimated. Which type of error is eliminated by calibration and explain the procedure. [7]

    b) What are the measured parameters in capacitive transduction? If the measured value of a Capacitance is 200 pF and the true value is 180 pF. Determine the relative error. [3]

12. a) Derive an expression for Gauge factor in terms of Poisson's ratio. Explain why the strain gauges are chosen to be in tension and compression. [6]

    b) With a neat diagram, explain the functioning of a Seismic displacement transducer. [4]

13. a) Write on the types of microphones and the associated principle and discuss in detail one of the Capacitive microphone. [6]

    b) What is humidity and how do you measure humidity using an Aluminum oxide hygrometer? [4]

14. a) What is quantizing error? Discuss the black diagram of a successive approximation with an example of 9 bit digital signal. [7]

    b) Write briefly about Virtual instrumentation. [3]

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15. a) Discuss the importance of potential electrodes and write on invasive and non-invasive Bio- potential electrodes with diagrams. [4]

    b) Discuss segments of ECG graph and compare the signals of ECG, EEG and EMG. [6]

16. a) Draw the pin diagram of IEEE bus and explain the functional aspects of Controller, Listener and Talker. [5]

    b) Define the thermodynamic laws and explain how temperature is measured using thermocouple with a cold junction compensation. [5]

17. Answer any ***two*** of the following:

    a) ISO 9001 elements and explain. [5]

    b) Spectrum Analysers and their application in electronics. [5]

    c) SCADA system and Industrial applications. [5]