Registration no:

<u>**B.Tech**</u>
PEEI5403

8th Semester Regular / Back Examination 2016-17
INDUSTRIAL INSTRUMENTATION
BRANCH(S): AEIE, ECE, EIE, ENV, ETC, IEE, MINERAL
Time: 3 Hours
Max Marks: 70
Q.CODE: Z213
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1   **Answer the following questions:**   **(2 x 10)**

a) What is MTTF? How it is related to reliability?

b) Define loading error with example.

c) Define fidelity and speed of response.

d) What is relative & absolute humidity?

e) What is mass Spectrometry?

f) Draw typical block diagram of position telemetry system.

g) Define NRZ and RZ codes for telemetry system.

h) What are the sensors used for flow and level measurement in power plant instrumentation.

i) What is swelling and shrinking in boiler measurement?

j) Explain the term IP and NEMA.

Q2 a) List the various sensors are used for temperature, level, flow and pressure measurements in power plant instrumentation. **(5)**

b) How can you prevent Ignition in a power plant? Draw a chart for ignition prevention. **(5)**

Q3 a) Derive the mathematical expression for step response of a second order system under damping and critically damping condition. **(5)**

b) What is the need of statistical analysis of measuring instruments? Define the following term:

Mean, Median, Mode and Variance. **(5)**

Q4 **a)** Discuss the various techniques of X-Ray generation. **(5)**

b) Explain Nephelometry and Turbidimetry. **(5)**

Q5 **a)** Discuss the schematic diagram and explain the operation of GAS chromatography. **(5)**

b) What is the importance of modulation in telemetry? Describe the different methods of modulation in digital data. **(5)**

Q6 **a)** What is thermal conductivity? Explain the thermal conductivity gas analyzer. **(5)**

b) Discuss the different methods for humidity measurement. **(5)**

Q7 **a)** Draw and explain the operation of a power plant cycle. **(5)**

b) Explain the operation of a typical TDM. Write differences between TDM and FDM. **(5)**

Q8 **Write short answer on any TWO:** **(5 x 2)**
a) pH measurements
b) MODEM and its operation
c) Flue gas analysis
d) Density measurements