Registration No.										

Total number of printed pages - 02

B.TECH
PEEI5403

8th Semester Regular / Back Examination 2015-16
INDUSTRIAL INSTRUMENTATION
BRANCH : CHEM, CSE, ELECTRICAL, IT, ITE

Time : 3 Hours

Max Marks : 70

Question Code : W366

Answer Question No. 1 which is compulsory and any FIVE from the rest.
The figures in the right-hand margin indicate marks.
Assume suitable notations and any missing data wherever necessary.
Answer all parts of a question at a place.

1. Answer the following questions : **2 x 10**

(a) Explain Loading error in a measurement system.
(b) Define Reliability. How reliability related to MTTF?
(c) What is known by dynamic calibration? How is it performed in a second order under damped system?
(d) How is hazardous location determined? Classify different zones on this basis.
(e) What is Mass Spectrometry?
(f) What are the important variables that need to be measured in power plant cycle?
(g) Draw a typical block diagram of voltage telemetry system.
(h) What is flue gas? List the gases present in flue gases.
(i) Explain the term NEMA and IP. What specifications do make in relation to hazards and safety?
(j) What is the sensitivity of a thermal conductivity gas analyzer? How conductivity is dependent on temperature?

2. **(a)** List various sensors/instruments used for the measurement of pressure, temperature, flow, level, and vibration in a power plant. **06**

(b) Describe a sodium analyzer. What are the harmful effects of sodium in the power plant equipment? **04**

3. **(a)** With the help of a neat sketch explain the working of a dual hot wire thermal conductive cell. **04**

(b) How can X-ray absorption spectra be utilized for analysis purposes? Discuss with relevant diagrams and analysis. **06**

4.	**(a)**	Sketch a typical wireless I/O and explain its operation.	**06**
	(b)	What is the difference between time division multiplexing and frequency division multiplexing? Discuss their advantages and disadvantages.	**04**
5.	**(a)**	Draw the scheme of a power plant cycle. Explain its operation.	**03**
	(b)	Where are vibration, expansions, and contractions to be measured and monitored in power plant cycle? What technique is used usually for expansion-contraction measurement?	**07**
6.		Why temperature control in a reactor is very important? Draw the control diagram of temperature control in a reactor using cascade arrangement and explain it.	**10**
7.	**(a)**	What are analysis, evaluation, and construction as suggested by NFPA?	**02**
	(b)	Draw the balanced scheme of a zener barrier protection system and explain its operation.	**08**
8.		Write short notes on any **TWO**:	**5 x 2**
	(a)	Methods of flue gas analysis	
	(b)	Principle and operation of spectroscopy	
	(c)	Statistical error analysis	
	(d)	Operation of Wireless I/O system with block diagram	
