

Registration No.

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Total number of printed pages - 02

**B.TECH**  
**PEEI5403**

**8<sup>th</sup> Semester Regular / Back Examination 2016 - 17**  
**INDUSTRIAL INSTRUMENTATION**

**BRANCH : Chemical**

**Time : 3 Hours**

**Max Marks : 70**

**Question Code :Z154**

**Answer Question No. 1 which is compulsory and any FIVE from the rest.**

**The figures in the right-hand margin indicate marks.**

**Answer all parts of a question at a place.**

1. **Answer the following questions :** **2 x 10**
- (a) List various causes of drift observed in an instrument.
  - (b) How is hazardous location determined? Classify different zones on this basis.
  - (c) Write at least two differences between TDM and FDM.
  - (d) How the smart transmitter plays a vital role in process industries?
  - (e) Define MTTF. Write the relationship between MTTF and Reliability.
  - (f) State with examples of necessity of moisture measurements in liquid.
  - (g) Explain the term NEMA and IP. What specifications do make in relation to hazards and safety?
  - (h) Define "Economy" and "Capacity" of an evaporator. Give their relationship.
  - (i) What is Mass Spectrometry?
  - (j) What is known by dynamic calibration? How is it performed in a second order under damped system?
2. (a) List various sensors/instruments used for the measurement of pressure, temperature, flow, level, and vibration in a power plant. **06**
- (b) With a suitable diagram describe a typical power plant cycle and explain the role of each component. **04**
3. (a) What is the importance of modulation in Telemetry? Briefly describe the methods of modulation in Digital data. **04**
- (b) Briefly describe the principle of operation of Voltage Telemetry system and position telemetering system. **06**

4. (a) How can X-ray absorption spectra be utilized for analysis purposes? Discuss with relevant diagrams and analysis. **06**
- (b) With the help of a neat sketch explain the working of a dual hot wire thermal conductive cell. **04**
5. (a) What is intrinsic safety? How does a Safety Triangle account for safety in hazardous condition? **03**
- (b) List various types of Spread spectrum used in Telemetry system. Describe operations of Transmitter and Receiver of a FHSS(Frequency Hopping Spread Spectrum). **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) Interference, Operational, and Installation Errors
- (b) Statistical error analysis
- (c) Principle and operation of spectroscopy
- (d) Draw block diagram and explain operation of wireless I/O system

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