

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : 91465**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Fourth Semester

Electronics and Instrumentation Engineering

EI 2251/EI 41/EI 1251/080300009/10133 EI 402 — INDUSTRIAL  
INSTRUMENTATION – I

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Calculate the torque developed by a motor shaft when it is running at 1500 rpm and delivering shaft power of 5 horse power.
2. What are the main advantages of a semiconductor strain gauge?
3. State Archimedes' principle.
4. Specify any four units that can be used for density.
5. What is meant by gauge pressure and absolute pressure.
6. Differentiate diaphragm from capsule.
7. What are the general classes of filled system thermometers.
8. For what application is the manganin wire preferred as temperature sensor.
9. On what factors does the response of thermocouple depend on.
10. Convert 1000 degree centigrade to degree Fahrenheit and degree Rankine.

PART B — (5 × 16 = 80 marks)

11. (a) What are the two types of mechanical load cells. Explain them in detail. (16)

Or

- (b) (i) Explain how proximity sensor can be used for torque measurement. (8)  
(ii) Explain with the help of suitable diagram about A.C. tachogenerator. (8)

12. (a) (i) Derive and explain the amplitude and phase response of seismic accelerometers. (12)  
(ii) Explain about calibration of vibration pickups. (4)

Or

- (b) (i) Explain in detail about bubbler based densitometry. (8)  
(ii) Explain in detail about bridge type gas densitometry. (8)

13. (a) Explain in detail with suitable diagram about ionization gauge and pirani gauge. Specify about its difference, advantages and disadvantages. (16)

Or

- (b) Explain about any three electrical method of pressure measurement. (16)

14. (a) Write short notes on

- (i) Bimetallic thermometer (6)  
(ii) Thermister (5)  
(iii) Different standards and units of temperature scale. (5)

Or

- (b) Explain in detail about RTD. Explain the need and working of 3 lead and 4 lead RTD. (16)

15. (a) Explain any four techniques that can be used for cold junction compensation of thermocouple. (16)

Or

- (b) Write short notes on

- (i) Laws of thermocouple (6)  
(ii) Fabrication of industrial thermocouple (5)  
(iii) Fibre optic temperature measurement. (5)