

Name :  
Reg No :

{D}

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
07 THRISSUR CLUSTER

**FIRST SEMESTER M.TECH. DEGREE EXAMINATION DEC 2017**

Department: Chemical Engineering  
Specialisation: Process Control  
**07CH 6107 Industrial Instrumentation**

**Time : 3 hours**

**Max.Marks: 60**

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1a	Explain the dynamic performance characteristics of instruments.	4
	<b>Answer b or c</b>	
b	What are the applications of instrumentations. Explain the functional elements of measuring instruments.	5
c	What are the errors occurring in the measurement.	5
Q.no.	Module 2	Marks
2a	Explain in details the various instruments to measure pressure using electrical properties change.	4
	<b>Answer b or c</b>	
b	Explain in detail the low pressure measurement using McLeod gauge .	5
c	Explain any two methods to measure high pressure.	5
Q.no.	Module 3	Marks
3a	Explain the laws of thermoelectricity.	4
	<b>Answer b or c</b>	
b	Explain the working of thermocouples, and two type of thermocouples and their applications.	5
c	Explain in detail the temperature measuring units which utilize the expansion of materials to measure it.	5

<b>Q.no.</b>	<b>Module 4</b>	<b>Marks</b>
<b>4a</b>	What are Area flow meters, give example.	<b>4</b>
<b>Answer b or c</b>		
<b>b</b>	Discuss about liquid level measurement in open vessel using bubbler system.	<b>5</b>
<b>c</b>	Explain the principle and working of electromagnetic flow meter.	<b>5</b>
<b>Q.no.</b>	<b>Module 5</b>	<b>Marks</b>
<b>5a</b>	Discuss the principle, working and applications of the strain gauges.	<b>5</b>
<b>Answer b or c</b>		
<b>b</b>	How thermal method used for measurement of moisture? Explain.	<b>7</b>
<b>c</b>	Explain humidity measurement using industrial dew point apparatus.	<b>7</b>
<b>Q.no.</b>	<b>Module 6</b>	<b>Marks</b>
<b>6a</b>	Explain the principle of ionization smoke detector.	<b>5</b>
<b>Answer b or c</b>		
<b>b</b>	Explain in detail the working of a gas chromatograph.	<b>7</b>
<b>c</b>	Explain in detail about thermal conductivity method for flue gas analysis	<b>7</b>