



Name :

Roll No. :

Invigilator's Signature :

CS / B.TECH (ICE/EIE-O) / SEM-8 / EI-801C / 2011

2011

ANALYTICAL INSTRUMENTATION

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

i) The pH value of acidic content is

- | | |
|--------|-------------------|
| a) > 7 | b) < 7 |
| c) = 7 | d) none of these. |

ii) Dew point is expressed as

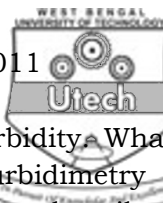
- | | |
|-------------------|-------------------|
| a) % (percentage) | b) °C |
| c) V_{ppm} | d) none of these. |

iii) Aerosol is formed by

- | | |
|--------------|--------------------------|
| a) Bolometer | b) Scintillation counter |
| c) Nebulizer | d) Nephelometer. |

- In Pursuit Of Knowledge And Excellence*

- [Turn over



8. a) Define turbidity. Define the units of turbidity. What is the basic difference between turbidimetry & nephelometry ? With the help of diagram, describe the operation of LASER based nephelometer. State some applications of turbidity measurement in process industries. 1 + 2 + 1 + 5 + 2
- b) What are the detectors used for *uv* absorption spectrometry ? 4
9. a) What are the components of a generalized sampling system ? Draw & discuss the scheme of a typical sampling probe with water separator. 1 + 4
- b) Describe the operating principle of Searle's rotating cylinder viscometer with necessary derivation. 5
- c) What is humister ? Give a comparative study between solution resistance element & polystyrene surface resistivity cell in context of humidity measurement. 1 + 4
10. Why is analytical instrumentation system necessary in industrial process ? What do you mean by online instruments ? Describe with neat diagram the working of thermal conductivity type gas analyzer. 4 + 3 + 8
11. Write short notes on any *three* of the following : 3 × 5
 - a) IR sources
 - b) X-ray spectrometry
 - c) Time of flight type mass spectrometer
 - d) Emission spectrometry
 - e) Measurement of viscosity
 - f) pH measurement.

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