	<u>Ulegh</u>
Name:	
Roll No.:	As Against Williams Said Expellent
Invigilator's Signature:	

## CS/B.TECH (ICE)/SEP. SUPPLE/SEM-8/EI-801C/2012

# 2012 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 )

l.	Cho	ose	the correct alternatives	for ar	ny <i>ten</i> of the following :
					$10 \times 1 = 10$
	i) The cgs physical unit for dynamic viscosity is				
		a)	poise	b)	pascal-second
		c)	gm/s	d)	kg/s.
	ii) The pH value of alkaline content is				
		a)	>7	b)	<7
		c)	=7	d)	none of these.

iii) Dew point is expressed as

a) %(percentage)

b) °C

c) V<sub>ppm</sub>

d) none of these.

iv) Water vapour absorbs mainly the radiation in the range of

a) IR ray

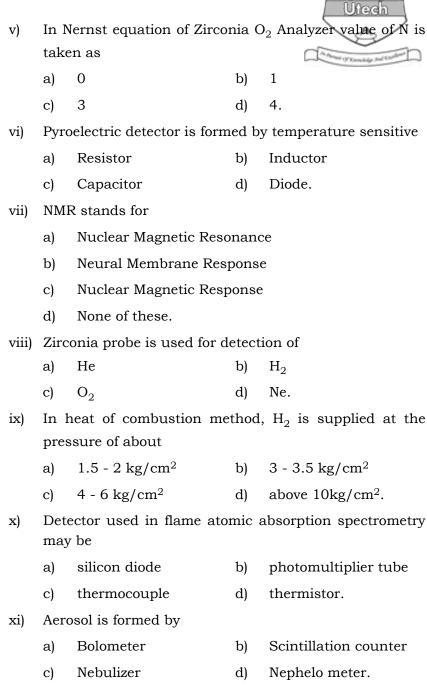
b) X ray

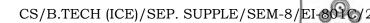
c) γ ray

d) UV ray.

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- xii) Specific gravity of any gas is the ratio of the
  - a) density of the gas and density of hydrogen at STP
  - b) density of the gas and density of water at STP
  - c) density of the gas and density of air at STP
  - d) none of these.

#### GROUP - B

### (Short Answer Type Questions)

Answer any *three* of the following.  $3 \times 5 = 15$ 

- 2. What is the difference between instrumentation and analytical instruments? What is inline and offline instruments?
- 3. State the basic principle of mass spectrometer. 5
- 4. Describe the operating of paramagnetic type oxygen analyzer.

5

- 5. What do you mean by humidity? What is dew point, vapour pressure, absolute humidity? 2 + 3
- 6. What is polarization ? How can it be minimized or eliminated ? 2 + 3

#### **GROUP - C**

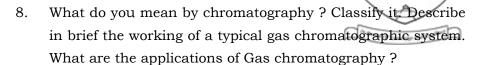
### (Long Answer Type Questions)

Answer any *three* of the following.  $3 \times 15 = 45$ 

7. 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

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2 + 3 + 7 + 3

- 9. Write in brief the techniques of density measurement of solids, liquids and gases. 5 + 5 + 5
- 10. a) Define relative humidity
  - b) Describe hair hygrometer with diagram
  - c) The reading of dry and wet bulb are  $18^{\circ}$ C and  $16^{\circ}$ C. What is the value of RH? 4+6+5
- 11. Write short notes on any *three* of the following:
- $3 \times 5$

- a) X-ray spectrometer
- b) pH measurement
- c) IR sources
- d) Katharometer
- e) Flame Ionization detector.

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