

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER – V• EXAMINATION – SUMMER 2016

Subject Code: 3351703

Date:16/05/2016

Subject Name: Analytical Instrumentation

Time: 02:30 PM to 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1** Answer any seven out of ten. દશમાંથી કોઇપણ સાતના જવાબ આપો. **14**
1. Define analytical instrumentation
 2. Define viscosity.
 3. Define density and specific gravity
 4. State principle of thermal conductivity for gas analysis.
 5. Define pH.
 6. State Beer- Lambert's law
 7. State the frequency and wavelength range of X ray.
 8. List basic parts of Gas chromatograph.
 9. List detectors used in Gas chromatograph
 10. List applications of refractometer.
- Q.2** (a) Explain importance of composition analysis in process industries **03**
- OR
- (a) Draw and explain elements of an analytical instrument **03**
- (b) List Application of composition analysis. **03**
- OR
- (b) Classify analytical instruments **03**
- (c) State the methods of viscosity measurement techniques **04**
- OR
- (c) Explain principle of Saybolt ' s viscometer **04**
- (d) Describe working principle buoyancy type densitometer **04**
- OR
- (d) Draw and explain the dual hot wire thermal conductivity cell **04**
- Q.3** (a) List and explain different techniques of filling gas to thermal conductivity cell **03**
- OR
- (a) Draw and explain null method of conductance measurement **03**
- (b) List calibration & maintenance steps for pH meter **03**
- OR
- (b) List techniques of O₂ analyzer **03**

	© Explain wind type paramagnetic O ₂ analyser.	04
	OR	
	© Explain basic polarographic set up	04
	(d) Explain working principle of single beam optical null type spectrophotometer	04
	OR	
Q.4	(d) Explain principle construction and working of X-ray absorption scheme.	04
	(a) Explain principle of NMR	03
	OR	
	(a) Draw block diagram of NMR spectrometer	03
	(b) Draw and explain block diagram of a Gas chromatograph	04
	OR	
	(b) Explain working principle with schematic diagram detectors for Gas chromatograph for thermal conductivity .	04
	© Explain principle construction and working of float type densitometer.	07
Q.5	(a) Explain Temperature compensation in conductivity measurement	04
	(b) Draw and explain block diagram of analytical Instrumentation.	04
	© Draw electromagnetic spectrum	03
	(d) Explain flame photo detector.	03
