

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER • 2014****Subject Code: 161705****Date: 26-05-2014****Subject Name: Instrumentation Measurement-II****Time: 10:30 am - 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Draw and describe high frequency type electrical conductivity measurement technique for aqueous solution. Obtain cell constant for it. **07**
- (b)** Explain schematic, operation, limitation, benefits and application of piezo-electric transducer for force measurement. **07**
- Q.2 (a)** Draw and describe hot-wire CO₂ thermal conductivity meter with its limitation. List thermal conductivity units. **07**
- (b)** Draw the functional block diagram of X-ray absorption spectroscopy and discuss the importance of each block in brief. **07**
- OR**
- (b)** Illustrate viscosity is one of the qualitative parameter in process instrumentation. Explain one of the suitable measuring techniques for liquid viscosity. **07**
- Q.3 (a)** Draw and describe Mass spectroscopy with its schematic, operation, limitation, benefits and application. **07**
- (b)** List the moisture measurement technique. Explain conductivity technique for moisture measurement in textile and paper industry. **07**
- OR**
- Q.3 (a)** Write the basic principle of NMR and illustrate the schematic, operation, limitation, benefits and application of NMR type spectroscope. **07**
- (b)** Draw and explain Op-Amp based direct reading pH meter with temperature compensation. **07**
- Q.4 (a)** Draw and describe paramagnetic Oxygen analyzer with its schematic, operation, limitation, benefits and application. **07**
- (b)** Explain basic principle of UV and visible type absorption spectroscopy. Draw and describe any one with its schematic. **07**
- OR**
- Q.4 (a)** Draw and describe IR-based gas density meter with its schematic, operation, limitation, benefits and application. **07**
- (b)** Explain Flame photometric detector (FPD) with its schematic, operation, limitation, benefits and application. **07**
- Q.5 (a)** Differentiate gas and liquid chromatography. Explain functional block diagram of gas chromatography. **07**
- (b)** Define and draw ion-selective electrodes. Compare it with combined pH electrodes with engineering importance. **07**
- OR**
- Q.5 (a)** What are the differences of ON line and OFF line analysis? Discuss about online sampling system. **07**
- (b)** List the types of velocity sensor for vibration measurement and explain one of them in detail. **07**
