

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019****Subject Code: 2161711****Date: 12/12/2019****Subject Name: Environmental 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.

- Q.1** (a) Explain the necessity of instrumentation and control for environment. **03**  
(b) How does quality of water effects environment? **04**  
(c) Explain gas chromatography hardware with the help of a schematic diagram. **07**

- Q.2** (a) List and give a detailed classification of raw water sources in nature. **03**  
(b) List 4 parameters considered for selection of analytical methods for laboratory analysis of wastewater and groundwater samples **04**  
(c) Explain in detail design considerations for opacity monitors **07**

**OR**

- (c) State and explain the practical criteria which downhole instrumentation for ground water monitoring must possess. **07**
- Q.3** (a) Define water sampler and explain uses of sampling systems. **03**  
(b) State any 4 subsystem components of commercially available automatic water samplers. **04**  
(c) Explain in detail general guidelines for site selection for obtaining wastewater samples **07**

**OR**

- Q.3** (a) State and explain 2 factors affecting selection of multiple v/s single site for sample collection of wastewater. **03**  
(b) State the fields (for sample identification) which should be present on the sample for its identification **04**  
(c) Explain in detail how level will be measured in an Anaerobic Digester in waste water treatment plant **07**
- Q.4** (a) List various techniques through which CO<sub>2</sub> analysis can be done **03**  
(b) Define Sewers, Sanitary sewers, collection sewers and combined sewers. **04**  
(c) Discuss about various primary and secondary ambient air quality standards **07**

**OR**

- Q.4** (a) State the flows (items/things) which are included in open channel flow **03**  
(b) List and explain various categories of air measuring devices. **04**  
(c) State any 14 features which may be found on advanced analyzers. **07**
- Q.5** (a) Explain types of flumes **03**  
(b) Explain the 2 types of spot flow measurement technique for open channel measurement **04**  
(c) Explain in detail Hot wire anemometer **07**

**OR**

- Q.5** (a) List various gases present in flue gases coming out of thermal power plant. **03**  
(b) Explain design criteria for settling tank. **04**  
(c) Explain in detail principle, construction and working of High Performance Liquid Chromatography with a neat figure **07**

\*\*\*\*\*