

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER 2013****Subject Code: 153503****Date: 02-12-2013****Subject Name: Basics of Fuel****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) What is the importance of purification processes in petroleum refining? Give a description of sweetening processes in detail. **07**
- (b) What are the general characteristics of gaseous fuel? Describe Catalytic cyclic processes (Segas Process) for oil gasification **07**
- Q.2** (a) What are theories for explaining petroleum origin? Explain general characteristics of liquid fuel. **07**
- (b) What are the benefits of coal gasification? Explain Lurgi process of coal gasification. **07**
- OR**
- (b) Give a description of Continuous catalytic steam reforming of naphtha (ICI processes) of oil gasification with the help of suitable diagram. **07**
- Q.3** (a) Give an outline of various breakdown processes used in petroleum refining. Differentiate between thermal cracking and catalytic cracking. **07**
- (b) What do you understand by rebuilding and reforming processes? Explain the characteristics of Petrol and kerosene. **07**
- OR**
- Q.3** (a) What do understand by ethanol blended fuel? Explain in detail the environmental impacts of burning fuel. **07**
- (b) What are the environmental impacts of oil spills? Why marine oil spills are more hazardous as comparative to oil spills on land. **07**
- Q.4** (a) Write short notes (60 words) on following topics: **07**
Cetane number, Flash point, Angle of repose, Deoiling in petroleum refining, Cold filter plugging point, Biodiesel, Wobbe index.
- (b) Describe following terms (200 words) : **07**
- i) Swelling index and caking index
 - ii) Characteristics of animal waste, agro waste and forest waste
- OR**
- Q.4** (a) Write short notes (60 words) on following topics: **07**
Flame speed, Octane number, Biodiesel, Visbreaking in petroleum refining, Grindability of coal, crude stabilization, Coking in petroleum refining
- (b) Describe following terms (200 words): **07**
- i) Chemistry of coal gasification
 - ii) Hydrogenation and Desulphurization in petroleum refining
- Q.5** (a) Which kind of wastes are included in municipal waste? Explain Biochemical pathway of producing fuel from municipal waste? **07**
- (b) Describe following terms (200 words): **07**
- i) Mineral matter and ash content in coal
 - ii) Cannel Coal and Boghead coal

OR

- Q.5 (a)** Define “municipal waste” in detail. Explain Thermochemical pathway of producing fuel from municipal waste? **07**
- (b)** Describe following terms (200 words): **07**
- iii) Volatile matter and fixed carbon in coal
 - iv) Mud circulation system in petroleum extraction and its benefits
