Reg. No. :

Question Paper Code : 91098

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Fifth Semester

Automobile Engineering

AT 2305/AU 54/10122 AU 506 — AUTOMOTIVE FUELS AND LUBRICANTS

(Regulation 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. List the composition of petroleum and classify the same.
2. What is meant by isonierization changes in the petroleum refining process?
3. Give the chemical formula of the aromatic fuel.
4. Brief about cetane rating.
5. What is meant by theoretical air and excess air in the combustion process?
6. Write briefly about biogas.
7. Give different frictional losses and the associated components in automotive engines.
8. List the main functions of the lubricating system.
9. Mention the important properties of lubricants.
10. Give the classification of grease.

PART B — ($5 \times 16 = 80$ marks)

11. (a) Discuss the following petroleum refining process with suitable diagrams.
(i) Petroleum distillation (ii) Cracking break down process.

Or

(b) Discuss the various process involved in the making of lubricants with suitable diagrams also list various components and their relevant lubricants used in automotive components.

12. (a) (i) Describe the chemical structure of SI engine fuels. (8)

(ii) Write short notes on the following characteristics of SI engine fuels Volatility, Crank case distillation, vapour lock characteristic and antilock quality. (8)

Or

(b) (i) Discuss the desirable characteristics of CI engine fuels. (6)

(ii) Brief about alcohols as alternative fuels for CI engines and explain one of the existing techniques with suitable diagram. (10)

13. (a) A furnace burns producer gas with 10 % excess air at the rate of 7200 km^3/h and discharge flue gases at 400°C and 760 mm Hg. Calculate the flue gas analysis, air requirement and volume of flue gases per hour. The gas supplied from a gas holder and its orsat analysis is CO_2 4.0, CnHm 0.4, CO 29.0, H_2 12.0, CH_4 2.6 and N_2 52.0. Ambient temperature is 30°C and pressure is 760 mm Hg. Assume complete combustion.

Or

(b) Explain the construction, working principle of Orsat apparatus.

14. (a) (i) Discuss the various factors affect the engine friction. (8)

(ii) Discuss about elastohydrodynamic lubrication. (8)

Or

(b) Explain the formation of lubricant film in journal bearing with the help of suitable sketches.

15. (a) Describe different additives and its properties added in the lubricants to achieve the desired properties.

Or

(b) Discuss about the various testing methods for lubricants and grease.