

B.E./B.TECH. Degree Examination, December 2020

Fifth Semester

**AE16505 - AUTOMOTIVE FUELS AND LUBRICANTS**

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

**PART A - (8 X 2 = 16 marks)**

1. Reforming increases the \_\_\_\_\_ of fuel  
(a) octane number (b) cetane number (c) viscosity index (d) oxidation stability
2. Friction losses are high at the time of \_\_\_\_\_  
(a) starting (b) Idling (c) Acceleration (d) Deceleration
3. Octane number is determined by comparing the performance of the petrol with the following HCs  
(a) mixture of cetane and iso-octane  
(b) mixture of n-heptane and isooctane  
(c) mixture of isooctane and alpha methyl naphthalene  
(d) mixture of cetane and alpha methyl naphthalene
4. Transposition rate is due to the difference in \_\_\_\_\_ between the burning and unburning gases in the combustion chamber.  
(a) Temperature (b) Chemical reaction (c) Physical delay (d) Pressure
5. Justify the preference of catalytic cracking over thermal cracking during the petroleum refining process.
6. What would cause the engine oil to deteriorate faster than the usual lifespan?
7. What would you infer from a fuel with higher viscosity index?
8. If the octane number of a fuel is 92, what would you say about the quality of that fuel?

**PART B - (4 X16 = 64 marks)**

09. (a) How would you extract different usable products from crude oil and explain the process ( 16 ) in detail with a neat sketch.

(OR)

- (b) Identify a suitable process involved in the manufacture of lubricating oil base stocks ( 16 ) with a neat sketch.
10. (a) Discuss the influence of important engine variables on the friction generated between ( 16 ) the engine moving parts with relevant sketches.

(OR)

- (b) Compare different lubrication regions with their relative merits and demerits. ( 16 )
11. (a) Select the suitable method to measure the calorific value of a solid fuel and explain its construction and working with a neat sketch. ( 16 )
- (OR)**
- (b) Select the suitable method which use 60 cc of sample to measure the viscosity of a given fuel and explain its construction and working with a neat sketch. ( 16 )
12. (a) Discuss the various stages of combustion process in Spark Ignition engine. ( 16 )
- (OR)**
- (b) (i) How would you justify that additives are essential for a neat fuel? ( 6 )
- (ii) Discuss few important additives employed in gasoline and diesel. ( 10 )