



B.E DEGREE EXAMINATIONS: MAY 2018

(Regulation 2015)

Sixth Semester

AUTOMOBILE ENGINEERING

U15AUTE36 : Fuels and Lubricants

COURSE OUTCOMES

- CO1:** Understand the refining process of petroleum
CO2: Understand the various types of fuels and their properties
CO3: Apply the knowledge in testing the fuel properties
CO4: Understand the properties and purpose of lubricants.
CO5: Understand the Alternate fuels available

Time: Three Hours

Maximum Marks: 100

**Answer all the Questions:-
PART A (10 x 1 = 10 Marks)**

1. Matching type item with multiple choice code

CO5 [K₂]

List I	List II
A. CNG	i. Very High Calorific value
B. DEE	ii. Trans esterification
C. Biodiesel	iii. Gaseous fuel
D. Hydrogen	iv. C ₄ H ₁₀ O

- | | A | B | C | D |
|----|-----|----|-----|----|
| a) | ii | i | iii | iv |
| b) | iii | iv | ii | i |
| c) | ii | iv | iii | i |
| d) | iii | i | ii | iv |

2. Ignition quality of diesel is indicated by

CO2 [K₁]

- | | |
|------------------|------------------|
| a) Octane Number | b) Cetane Number |
| c) Flash point | d) Fire Point |

3. State which of the following statements are true

CO5 [K₁]

- The energy content of ethanol is about 33% less than pure gasoline.
- Ethanol does not pollute the environment
- Ethanol has very high calorific value
- E10 is gasoline with 10% ethanol content.

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

- | | | |
|---|-----|-------------------|
| 11. Write down the requirements of Ideal gasoline. | CO1 | [K ₂] |
| 12. Explain Research Octane Number (RON) and Motor Octane Number (MON). | CO2 | [K ₂] |
| 13. Explain crankcase dilution of fuels in SI engine. | CO2 | [K ₁] |
| 14. Define Performance Number. | CO2 | [K ₂] |
| 15. Write down the basic requirement of additives. | CO4 | [K ₂] |
| 16. Name the three different type of Air fuel mixture. | CO3 | [K ₁] |
| 17. State any few difficulties of using alcohol as fuel. | CO5 | [K ₂] |
| 18. Write short notes on biodiesel. | CO5 | [K ₂] |
| 19. List out various methods for determining engine friction. | CO3 | [K ₁] |
| 20. Explain Viscosity Index. | CO1 | [K ₂] |

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

- | | | |
|---|-----|-------------------|
| 21. Explain refining process of crude oil with a neat sketch and write down products of refining process. | CO1 | [K ₂] |
| 22. Briefly explain the structure of petroleum. | CO2 | [K ₂] |
| 23. a. Write short notes on effects of engine variables on Friction. (7) | CO3 | [K ₁] |
| b. Write down the detailed procedure of Reid vapor pressure test to determine the volatility of fuel. (7) | | |
| 24. Write down the construction and working of Orsat apparatus with neat sketch. | CO3 | [K ₂] |
| 25. Explain briefly about various techniques used for alcohol as a fuel in diesel engine. | CO5 | [K ₂] |
| 26. With a neat sketch explain bearing lubrication. | CO4 | [K ₂] |
| 27. Write short notes on Production, Storage and Material compatibility of LPG. | CO5 | [K ₂] |
