

Reg. No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

B.E / B.TECH. DEGREE EXAMINATION, MAY 2023

III Semester

AE18304 – AUTOMOTIVE FUELS AND LUBRICANTS**(Regulation 2018)****TIME: 3 HOURS****MAX. MARKS: 100**

- CO 1** Explain the process of manufacturing of fuels and lubricants from crude oil.
- CO 2** Explain the sources of friction in engine components and discuss the different types of lubrication systems in managing the friction.
- CO 3** Discuss the characteristics of lubricants when in use and outline the need for requirements and additives of lubricants.
- CO 4** Outline various properties and testing of automotive fuels.
- CO 5** Explain and compare the mechanism of combustion, knocking, fuel additives in spark ignition and compression ignition engines.

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Identify the fuel type that best suits the internal combustion engines and mention its significance.	1	3
2.	Prioritize the properties that are improved after solvent extraction during the refining process of lubricants.	1	3
3.	Identify the main components of engine friction.	2	2
4.	Prioritize the functions of lubricating system.	2	3
5.	Synthetic lubricants perform better than conventional lubricant – State your opinion and justify.	3	3
6.	Identify the constituent that improves the consistency of grease and the most common locations where grease can be applied in an automobile.	3	3
7.	Differentiate gross calorific value with net calorific value of fuel.	4	3
8.	Identify the property that helps to determine the operating temperature range of fuel and mention its significance.	4	3
9.	Prioritize the sources of knocking in a spark ignition engine.	5	3
10.	Additive simply add cost to the fuel or improves the performance of fuel – State your opinion and justify.	5	3

PART- B (5 x 14 = 70 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Identify the the significance of refining the crude oil. With a neat sketch explain the step by step process involved in the refining of crude oil and the byproducts of refining.	(14)	1	3
	(OR)			
(b)	Compare and discuss the operating conditions of thermal cracking with catalytic cracking with the help of neat sketches.	(14)	1	3
12. (a)	Prioritize the engine variables that influence the engine friction and discuss them in detail.	(14)	2	3
	(OR)			
(b)	Identify the locations where the boundary lubrication exist in an automotive engine and discuss them in detail.	(14)	2	3
13. (a)	Identify and discuss any four important additives used to improve the essential qualities of lubrication oil.	(14)	3	2
	(OR)			
(b)	Discuss the most commonly used tests to determine the consistency and drop point of grease.	(14)	3	2
14. (a)	Identify the apparatus used to determine the calorific value of a liquid fuel and with a neat sketch explain the procedure for the same.	(14)	4	3
	(OR)			
(b)	Differentiate flash point and fire point of a fuel. Discuss the procedure to determine them with neat sketches.	(14)	4	3
15. (a)	Identify and discuss the different stages of combustion in spark ignition engines with a neat sketch.	(14)	5	2
	(OR)			
(b)	Identify and discuss the different stages of combustion in compression ignition engines with a neat sketch.	(14)	5	2

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	Compare the process of normal combustion and knocking in spark ignition engine with relevant sketches and discuss the demerits of knocking.	(10)	5	3