

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – June 2026
Programme Name: B Tech (ME)
Semester: VII
Subject Code: UG11T4706
Subject Name: FUELS AND LUBRICANTS

Date: 15.06.2026

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. In crude oil, what constitutes paraffin
a) Straight chain hydrocarbon b) Straight chain cyclo hydrocarbon
c) Straight chain olefin d) Straight chain single bond hydrocarbon
2. Which of the following types of coal is the best fuel
a) Wood b) Peat c) Lignite d) Bituminous
3. Water gas is a mixture of
a) CO₂ and O₂ b) O₂ and H₂ c) H₂, N₂ and O₂ d) CO & H₂
4. The viscosity index can be improved by adding _____
a) Linear polymers b) Branched polymers c) Cyclic polymers
d) Inorganic materials
5. vegetable oils are added to the lubricants to improve their _____
a) Lubrication b) Oiliness c) Viscosity d) Efficiency
6. The Natural Gas consists of 95% of which gas?
a) Methane b) Butane c) Propane d) Ethane

7. Which are the two main alcohols used in the engine as a fuel?
a) Butanol and methanol b) Propanol and butanol c) Ethanol and propanol
d) Methanol and Ethanol
8. What is the typical voltage of a DC fast charging station for electric vehicles?
a) 12-24 volts b) 110-120 volts c) 208-480 volts d) 600-800 volts
9. Bio ethanol, often known as _____, is a denatured alcohol.
a) Ethylene b)Methylated spirit c)Ethylene glycol d)Methylene
10. Saponification value of an oil is the number of milligrams of potassium hydroxide required to saponify completely _____ grams of the oil.
a) 10 b)1 c)1000 d)100

Section B

Five Questions of 02 Marks each

11. Differentiate between cracking and reforming
12. Write a note on emission characteristics of CNG.
13. Enumerate the desirable properties of D.E.E. and D.M.E. as an I.C. Engine Fuel.
14. What are the engines modifications required to be carried out for using natural gas as fuel in existing diesel engines?
15. Mention the limitations of Solar cells

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

- 16a) Discuss about Bituminous Coal and characteristics of coke (5Marks)
- b) With neat sketch explain how is Producer gas manufactured? State its composition and uses. (5Marks)
- 17a). Discuss in detail about the molecular structures of various petroleum products. (5Marks)
- b) Explain the process of i) removing impurities ii) separating petroleum in to fractions during the petroleum refining (5Marks)
- 18a) Name different types of typical additives blended in mineral oils and discuss in detail about i) Thickeners ii) Foam Inhibitors (6Marks)

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- b) What is the basic function of grease? and discuss the formulation of grease (4Marks)
- 19a) Define aniline point and explain the procedure to determine it (5Marks)
- b) Discuss in detail various factors affecting delay period in CI engines (5Marks)
- 20a) Explain the manufacture of ethanol from sugarcane with schematic diagram? (5Marks)
- b) Discuss briefly the challenges associated using alcohols in diesel engines. (5Marks)
- 21a) Discuss the performance and emission characteristics of biodiesel fuel engine (5Marks)
- b) with neat sketch briefly explain the functions of Fuel Cell (5Marks)
- 22a) What are the types of Hybrid drives? Discuss with neat layouts (5Marks)
- b) Discuss the methods of storing and handling of hydrogen (5Marks)
