

302

Register No.:

April 2024

*Time – Three hours*  
*(Maximum Marks: 100)*

- [N.B. 1. Answer all questions under Part-A. Each question carries 3 marks.  
2. Answer all the questions either (A) or (B) in Part-B. Each question carries 14 marks.]

PART – A

1. Write short notes on solid fuel and liquid fuel.
2. What is gravimetric and volumetric analysis?
3. Define Octane number.
4. Mention the emissions range of CNG, Methanol and Ethanol.
5. List out the factors that affect SI engine combustion.
6. Mention the sources of pollutants that cause air pollution.
7. What are the sources of engine noise?
8. What is crank case emission? How is it controlled?
9. What are the functions of state pollution control board?
10. What is fuel quality standard?

[Turn over.....

PART – B

11. (a) Explain the construction and working of Boy's gas calorimeter with a neat sketch.

(or)

- (b) (i) Determine the mass of air required for the complete combustion of 1kg of coal whose analysis by weight is given below: Carbon – 83%, Hydrogen – 5%, Oxygen – 2%, Sulphur – 0.2%, Nitrogen – 9.8%. (7)  
(ii) Derive the expression of theoretical volume of air required for complete combustion of fuel. (7)

12. (a) Explain ethanol production process in detail with simple sketch.

(or)

- (b) Explain CNG engine with a neat sketch. List out the advantages and disadvantages.

13. (a) (i) Briefly explain the working of Hartridge and Bosch Smoke meters. (9)

- (ii) What is Knocking? Explain the factors affecting diesel knock. (5)

(or)

- (b) (i) Explain the procedure for analysis of exhaust gases using Orsat apparatus. (9)

- (ii) Explain about Air – cell combustion chamber. (5)

14. (a) (i) Explain various types of Manifolds used in IC engines with neat diagram. (9)

- (ii) What is exhaust muffler? Explain any two types of muffler used in engine. (5)

(or)

- (b) Explain the construction and working principle of a Catalytic converter with a neat sketch.

15. (a) Explain the impact of shifting to BS VI emission standard.

(or)

- (b) Explain the following:

- (i) Microprocessor based control system. (7)

- (ii) Pollution controlled vehicles. (7)

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