

Reg. No. :

Question Paper Code : 25023

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third Semester

Automobile Engineering

AT 8301 – SPARK IGNITION ENGINES

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the functions of a carburetor.
2. List the A/F ratios under which a SI engine operates during idling and smooth acceleration.
3. How fuel injection takes place through a fuel injector?
4. List the advantages of electronic ignition system.
5. What is knocking? Why it happens in a SI engine?
6. What is meant by stratified charge combustion?
7. What is a reformed fuel?
8. Write the advantages of using LPG as fuel.
9. From when does the Bharat stage – VI emission norms comes into effect in India.
10. What are the causes for formation of CO, and NO_x?

PART B — (5 × 13 = 65 marks)

11. (a) (i) With a load versus A/F ratio graph, present a brief. Outline about the air-fuel mixture requirements. (7)
- (ii) Discuss the necessity and working of secondary air injection system with neat sketch. (6)

Or

- (b) (i) Describe how a Carburettor supplies air-fuel mixture under different loading conditions to the engine. (10)
(ii) Draw a schematic of the air flow system through a Carburettor. (3)
12. (a) (i) Describe the working of multi point fuel injection system with a neat sketch. (10)
(ii) Draw a schematic of the air injection system. (3)

Or

- (b) (i) Explain the working of distributorless ignition system with a neat sketch. Mention its merits over an ignition system with distributor. (7+3)
(ii) Discuss in brief about ignition timing for a SI engine.
13. (a) (i) Explain the pent roof type of combustion chambers and its merits with neat sketches. (9)
(ii) List the requirements of an efficient combustion chamber for a SI engine. (4)

Or

- (b) (i) With $P-\theta$ diagram discuss in detail about stages of combustion in SI engines. (10)
(ii) Mention the characteristics of a lean burn combustion system. (3)
14. (a) Explain the performance characteristics of SI engine fueled with liquid fuel using neat sketches.

Or

- (b) Discuss about utilisation of fuels on neat, blended, dual fuel, informed fuel and flexi fuel basis.
15. (a) Discuss about the positive crank case ventilation system. Elaborate on evaporative emission control methods with neat sketches.

Or

- (b) Explain the measurement of HC by Flame Ionization Detector (FID) method using neat sketches.

PART C — (1 × 15 = 15 marks)

16. (a) Describe the measurement of CO and CO₂ by NDIR Analyzers with neat sketches.

Or

- (b) Discuss about the EURO VI emissions standards to be used in our country from April 2020 with respect to objectives and need.