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Question Paper Code : 51090

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Third Semester

Automobile Engineering

AT 2201/AT 33/AT 1201/080190002/10122 AU 304 — AUTOMOTIVE ENGINES

(Regulation 2008/2010)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Classify internal combustion engines based on cycle of operation.

2. Why deflector is used in 2-stroke engines?

3. What is manifold wetting?

4. State the need for a governor in a diesel engine.

5. What is MBT timing?

6. What is the major difference between knocking in S.I and C.I engine?

7. How does supercharging increase power output on an engine?

8. State any two methods used to measure friction power of the engine.

9. State the advantages of dry sump lubrication system.

10. What are the limitations of air-cooling?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Compare S.I and C.I engines. (8)

(ii) Derive the expression for air standard efficiency of Otto cycle. (8)

Or

(b) (i) Explain the construction and working of crankcase scavenged 2-s engine. (8)

(ii) A diesel engine has a compression ratio of 20 and cut-off takes place at 5% of the stroke. Find the air-standard efficiency. Assume $\gamma = 1.4$. (8)

12. (a) Explain the construction and working of constant vaccum carburetor with neat sketch. (16)

Or

(b) Explain the construction and working of distributor type fuel injection pump with neat sketches. (16)

13. (a) Discuss the phenomenon of knock in S.I. engines. Also, discus the effect of engine variables of knocking/detonation. (16)

Or

(b) Explain the various stages of combustion in C.I. engines with $P-\theta$ diagram. (16)

14. (a) (i) Explain the thermodynamic analysis of supercharged engine. (8)

(ii) Discuss the positive effects of supercharging a C.I. engine. (8)

Or

(b) (i) What is a performance map? Draw the performance map of automotive S.I. engine. (8)

(ii) An eight-cylinder, four-stroke engine of 9 cm bore and 8 cm stroke with a compression ratio of 7 is tested at 4500 rpm or a dynamometer which has 54 cm arm. During a 10 minutes test the dynamometer scale beam reading was 42 kg and the engine consumed 4.4 kg of gasoline having a calorific value of 44000 kJ/kg. Air at 27°C and 1 bar was supplied to the carburetor at the rate of 6 kg/min. Find

(1) The brake power delivered

(2) The brake thermal efficiency

(3) The volumetric efficiency. (8)

15. (a) Explain the different types of wet sump lubrication system with neat sketches. (16)

Or

(b) Explain the construction and working of forced circulation cooling system and its components with neat sketches. (16)
