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(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 140505 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. V) THEORY EXAMINATION, 2015-16

I. C. ENGINES & COMPRESSORS

[Time:3 hours] **[Total Marks:100]**

Section-A

1. **Attempt all parts. All parts carry equal marks. Write answer of each part in short.** (2×10=20)

   (a) State two differences between two stroke & Four Stroke Engines.

   (b) Write the name of various fuels used in IC Engines.

   (c) What is octane & Cetane Number?

   (d) Mention different types of combustion chamber used in SI engines.

   (e) What is the difference in between reciprocating & centrifugal compressor?

(f) Write the formula for efficiency of Otto and Diesel cycle.

(g) Draw P-v & T-s diagram for Air Standard Ericsson cycle

(h) What are the major pollutants in exhaust emission?

(i) State various types of injection System.

(j) What do you mean by blow by losses?

Section-B

Attempt any five questions from this section. (5x10=50)

2. Compare Otto, Diesel and Dual cycles for the

   a) Same compression ratio and heat input

   b) Same maximum pressure and temperature

3. a) Write short notes on Surging and stalling.

   b) Write short notes on diesel knock and its control.

4. Following data relates to 4 cylinders, 2 stroke petrol engine. Air/ Fuel ratio by weight 16:1. Calorific value of the fuel: 45200 kj/kg, Mechanical efficiency =82%. Air standard efficiency = 52%, Relative efficiency =70%, Volumetric efficiency = 78%, Stroke/bore ratio= 1.25, Suction condition: 1 bar, 25 °C Speed = 2400 rpm, Power at brakes of 72 kW. Calculate

   i) Compression ratio.

   ii) Brake specific fuel consumption m.

   iii) Bore and stroke.

5. Derive an expression for the efficiency of a Dual Cycle with P-V & T-S Diagram.

6. Why engine cooling is necessary. Explain the working of thermo-syphon cooling system with neat sketch.

7. Prove that for two stage compressors, the work done on one kg. of air is minimum with perfect intercooling when the intemediate pressure is geometric mean of the suction and delivery pressures.

   $P_i = \sqrt{P_s P_d}$

   Where P_s = Suction pressure.

   P_d = Delivery pressure.

8. What are the advantages of supercharging? Explain the effect of altitude on power output.

9. What is the main function of a spark plug? Draw a neat sketch and explain its various parts.

Section-C

Attempt any two questions from this section. (2x15=30)

10. (a) How are the injection system classified? Describe them briefly. Why the air injection system is not used now days?

    (b) Explain the stages of combustion in a IC engine.

11. (a) Explain the construction and working of a root blower and axial flow compressor with a neat sketch.

    (b) Sketch and explain working principle of typical thermostat use in engine cooling system.

12. (a) What do you mean by combustion? List and explain various stages of combustion in IC engines.

    (b) Discuss the effect of following

    i) Effect of engine speed and load on flame propagation in SI engine.

    ii) Effect of spark timing, engine load & compression ratio on detonation in SI engine.

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