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

Paper ID : 140525 Roll No. | | | | | | | | | | |

**B.TECH**

**(SEM. V) THEORY EXAMINATION 2015-16**

**IC ENGINES & COMPRESSORS**

**EME-505**

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

**Section-A**

1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. **(10x2=20)**

   (a) What is surging?

   (b) How the effciency of an Otto cycle is increased?

   (c) What is mean effective pressure in IC Engine?

   (d) Explain the knocking in IC Engines?

   (e) What are the Advantages and of using LPG in Car?

   (f) What is Scavenging?

   (g) Explain the meaning of ignition advance.

(h) What is meant by supercharging?

(i) Which are the reference fuels for knock rating of S I engines?

(j) Why diesel Engine doesn't have spark plug?

## Section-B

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

2. What are the differences between two stroke and four stroke engines. Draw the actual valve timing diagram for a 4 stroke and 2 stroke S I Engine.

3. Discuss the effects of gasoline volatility on cold starting, hot starting, warm up and vapour lock. What is performance number and diesel index?

4. Discuss the effects of compression ratio, engine speed and spark advance on the knocking in S I Engine.

5. Explain the working principle of a magneto ignition system with neat diagram.

6. Explain the stages of combustion in S I Engines. Explain the terms flame speed and ignition lag.

7. Explain the construction and working of simple carburetor in a S I Engine. What are the A/F requirements of a carburetor at different operating conditions?



8. Distinguish between the 'physical ignition delay' and 'chemical ignition delay'. Discuss the effect of different variables on ignition delay.

9. Explain the working of reciprocating compressor with a neat sketch.

## Section-C

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

10. In a test of a four-cylinder, four stroke petrol engine of 75 mm bore and 100 mm stroke, the following results were obtained at full throttle at a constant speed and with a fixed setting of the fuel supply of 0.082 kg/min.

bp with all cylinder working=15.24 KW

bp with cylinder number 1 cut-off=10.45 KW

bp with cylinder number 2 cut-off=10.38 KW

bp with cylinder number 3 cut-off=10.23 KW

bp with cylinder number 4 cut-off=10.45 KW

Estimate the indicated power of the engine under these conditions. If the calorific value of the fuel is 44 MJ/kg, find the indicated thermal efficiency of the engine. Compare this with the air standard efficiency, the clearance volume of one cylinder being 115 cc.

11. Show advantages of multistage compression with help of PV and TS diagram. Derive optimum pressure ratio for two stage minimum work of compression.

12. A diesel engine has a compression ratio of 20:1 with an inlet of 95 kPa, 290 K, state 1, with volume 0.5 L. The maximum cycle temperature is 1800 K. Find the maximum pressure, the net specific work and the thermal efficiency.

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