The Assam Royal Global University, Guwahati

Royal School of Engineering and Technology
B.Tech., 6th Semester
Semester End Examination, August, 2021
Course Title: Internal Combustion Engines
Course Code: MEE022C602

Time: 3 Hours **Maximum Marks: 70**

Note: Attempt all questions as per instructions given.
The figures in the right-hand margin indicate marks.

Section –A

Q.1. Attempt all questions. (Maximum word limit 50) **2 x 8=16**

a. Define compression ratio.

b. Name the constituent hydrocarbon in LPG.

c. Knock in CI Engines is caused by the _____ of injected fuel.

d. What is the function of pre combustion chamber in CI engines?

e. What are the sources of non-exhaust emission from IC engines?

f. What is supercharging?

g. Name the different types of Ignition system.

h. Define mechanical efficiency.

Q.2. Answer any two of the following. **6 x 2=12**

a. Explain the valve timing for low speed and high speed engines with suitable diagrams.
b. Name the reference fuels used in the determination of Octane Number. With suitable diagram, explain the phenomenon of knock in SI engines.
c. Differentiate between Port injection and Throttle-body injection with suitable diagram.

Q.3. Answer any two of the following. **7 x 2=14**

a. With suitable diagram, explain the stages of combustion in CI engines.
b. What is delay period and what are the factors that affect it?
c. Discuss the factors on which the design of combustion chamber for IC engines depend.

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Section –B

Q.4. Answer any two of the following. **7 x 2=14**

a. Define volumetric efficiency. Differentiate between supercharging and turbocharging.
b. What is a thermal converter? How does it help to reduce emissions from engines?
c. Describe the working of a magneto ignition system.

P.T.O

Q.5. Answer any two of the following. **7 x 2=14**

a. For an ideal Otto cycle the temperatures at the beginning and end of compression are 50^0C and 373^0C respectively. Determine the compression ratio and air standard efficiency of the engine. Assume $\gamma = 1.4$.
b. A single cylinder 4-stroke diesel engine develops 25 kW at 2500 rpm. Its bsfc is 0.3 kg/kW h. The fuel is injected at a pressure of 150 bar over a crank travel of 25^0. The pressure in the combustion chamber is 40 bar. Calculate the diameter of fuel orifice if the density of fuel is 850 kg/m^3.
c. An engine working on Otto cycle consumes 10 liters of petrol per hour and develops 25 kW. If the density and CV of petrol are 750 kg/m^3 and 44 MJ/kg, determine the indicated thermal efficiency of the engine.

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