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10AU55

Fifth Semester B.E. Degree Examination, Dec.2015/Jan.2016

Auxiliary Systems of Automotive Engines

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain with suitable graph, mixture requirements of an automotive S.I. engine from no load to full load. **(10 Marks)**

b. A simple carburetor under certain condition delivers 5.45 kg/hr of petrol with an air-fuel ratio of 15:1. The fuel jet area is 2 mm^2 with a coefficient of discharge of 0.75. If the tip of fuel jet is 0.635 cm above the level of petrol in the float chamber and venturi throat coefficient of discharge is 0.80, calculate:

i) The venturi depression in cm of H_2O necessary to cause air and fuel flow at the desired rate.

ii) The venturi throat diameter.

iii) The velocity of air across the venturi throat.

Assume density of air is 1.29 kg/m^3 and specific gravity of petrol = 0.72. **(10 Marks)**

2 a. What is Dieseling in carbureted engine? How it influence the emission? **(04 Marks)**

b. List out the merits and demerits of petrol injection system in comparison with carbureted supply system. **(06 Marks)**

c. With neat sketch, explain the working principle of electronic ignition system and list out the advantages. **(10 Marks)**

3 a. Describe with suitable sketch, the working principle of Jerk pump system. **(10 Marks)**

b. Mention and discuss briefly, the requirements of good diesel injection system. **(10 Marks)**

4 a. A six cylinder, four stroke engine develops 125 KW at 3000 rpm. Its brake specific fuel consumption is 200 gm/KWh. Calculate the quantity of fuel to be injected per cycle per cylinder. Specific gravity of fuel is 0.85. **(05 Marks)**

b. With suitable graph, explain the injection rate characteristics of Pintle and Pintaux nozzle. **(05 Marks)**

c. With suitable sketch, explain the common rail direct injection system. **(10 Marks)**

PART – B

5 a. Sketch and explain the following:

i) Baffle type muffler

ii) Helmholtz resonator **(10 Marks)**

b. Write short notes on the following:

i) Spark arrester

ii) Waste heat recovery **(10 Marks)**

6 a. Compare the quantity of water required for 90 KW petrol and diesel engine in which water is raised in temperature by 27°C in passing through jackets. In petrol engine the percentage of energy going to coolant is 32% and in diesel engine 28%. The efficiency of petrol engine and diesel engines are 25% and 30% respectively. Assume specific heat of water at constant pressure 4.187 kJ/kgK. **(06 Marks)**

b. List out the methods used for circulating water around the cylinder of engine. **(04 Marks)**

c. Explain with sketch, thermostat assisted cooling system. **(10 Marks)**

7 a. Explain Mist lubrication system and list the disadvantages of it. **(06 Marks)**

b. Explain with sketch, positive crank case ventilation system. **(06 Marks)**

c. With neat sketch, explain full pressure type of wet sump lubrication system used in automotive engine. **(08 Marks)**

8 a. Explain with suitable sketch, turbo charger with an inter cooler for an automotive engine. **(10 Marks)**

b. Compare the supercharger with turbo charger. **(04 Marks)**

c. List out the limitations of super charging for petrol and diesel engines. **(06 Marks)**

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