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School of Mechanical Engineering
Digital Assignment-I, Winter 2023-24
B.Tech. Automotive/Mechanical Engineering

Course Code: BMEE325L

Course Name: Internal Combustion Engines

Slot: C1+TC1

Faculty In-charge: Dr. E Porpatham

Date of submission: 25.04.2024

Max. Marks: 10

Class Number: VL2023240504596

- Assume suitable data if needed

(Maximum Marks: 4 x 2.5 =10 Marks)

1. A 4-stroke, 4-cylinder diesel engine develops 100 kW at 3000 rpm. Its brake-specific fuel consumption is 180 g/kWh. Calculate the quantity of fuel to be injected per cycle per cylinder in cc. The specific gravity of the fuel may be taken as 0.88.

2. The exhaust gas of a gasoline engine was analysed and volumetric analysis is as follows.
   CO_2-13%, O_2-2.2%, CO-0.2%, CH_2-0.1%, N_2-reminder
   Assuming the fuel to C_xH_y, determine the air-fuel ratio and identify the fuel type.

3. A simple jet carburetor is required to supply 5 kg of air and 0.5 kg of fuel per minute. The specific gravity is 0.75. The air is initially at 1 bar and 300 K. Calculate the throat diameter for a flow velocity of 100 m/s. velocity coefficient is 0.8. If the pressure drop across the fuel metering orifice is 0.8 of that of the throat, calculate the orifice diameter assuming Cdf=0.6 and γ=1.4.

4. The following details were noted in a test on a 4-stroke engine, diameter=100 mm, speed of the engine=1600 rpm, fuel consumption=0.2 kg/min, calorific value of fuel is 44000 kJ/kg, difference in tension on either side of the brake pulley=40 kg, brake circumference is 300 cm. If the mechanical efficiency is 80%. Calculate brake thermal efficiency, indicated thermal efficiency, indicated mean effective pressure and bsfc.

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