The Open University of Sri Lanka
Faculty of Engineering Technology

072

Study Programme	: Diploma in Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	: **DMX4208 – Automobile Technology**
Academic Year	: 2021/22
Date	: 21st January 2022
Time	:.14.00 – 17.00 Hrs
Duration	: 3 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY BEFORE ANSWERING THE QUESTION PAPER

Instructions.: This question paper consists of seven (07) questions. You are required to answer any six (06) questions. All questions carry equal marks.

Question 01

a. Explain with approximate values, the energy conversion in a Spark Ignition engine.

b. Explain why an IC engine should be equipped with an efficient cooling system for effective functioning.

Question 02

a. By means of a sketch explain the correct operation of a forced circulation water cooling system of an automobile engine.

b. An internal combustion Engine which develops 50 kW brake power has a pressurized, forced water circulation system, for cooling. This Engine converts 28% of the heat energy available in fuel into useful work and the energy lost to cooling water accounts for 30% of the heat energy of the fuel. Determine the rate of heat energy carried away by coolant in kJ/s.

Question 03

a. For an internal combustion Engine it is necessary to dissipate 168 kJ/s het energy from the pressurized, forced cooling water circulation system. If the temperature of water at the outlet of the engine is 90o C and that at the inlet to the engine is 80oC, respectively, calculate the flow rate of water in the Engine. (Specific heat of water is 4.2 KJ/KgoC and there is no thermostat installed in the system).

b. By means of sketches, explain the construction and operating principle of piston rings.

Question 04

a. Explain the difference between hydrodynamic and boundary layer lubrication

b. Your friend who is working as an automotive mechanic advices you that by switching off the engine at un-necessary occasions such as traffic will extend the life time of the engine as the engine running time is reduced. Explain whether you agree with this advice with a brief explanation.

Question 05

a. By means of a sketch, explain the operating principle of a Wankel rotary engine.

b. By means of sketches, explain the operating principle of a hydraulic power steering system.

Question 06

a. A single cylinder Four Stroke diesel engine, having swept volume of 850 × 106 m 3 is tested at 300 rpm. When a braking torque of 50 Nm is applied, analysis of the indicator diagram results in mean effective pressure of 0.8 MPa. Calculate Brake Power and mechanical efficiency.

b. By means of neat sketches explain the construction and operation of a twin tube shock absorber.

Question 07

a. A Four Stroke IC Engine rotating at 2400 rpm has a cylinder bore diameter of 100 mm and crank radius of 100 rpm. From indicator diagram mean effective .pressure is found as 100 kPa. If the mechanical efficiency is 80% find the Brake Power.

b. Explain how the stabilizer bar affect the stability of a vehicle when negotiating a turn.

END.