C1 + TC1

VIT
Vellore Institute of Technology

SCHOOL OF MECHANICAL ENGINEERING

CONTINUOUS ASSESSMENT TEST – I - WINTERSEMESTER 2019-2020

Programme Name & Branch: B. Tech (BME/BEM/BMA)

Course Code: MEE 2003

Course Name: THERMAL ENGINEERING SYSTEMS

Faculty Name(s): Prof. R. Prakash, Prof. B.B. Sahoo, Prof. SenthurPrabhu, & Prof. M. Senthil Kumar

Class Number(s): VL2019205002115, 1156, 2023, 1257

Exam Duration: 90 mins

Maximum Marks: 50

Answer ALL questions (5x 10 = 50 Marks)

Sl.No.	Question	Course Outcome (CO)
1.	a) What is meant by firing order of an engine? b) What are the functions of piston rings? c) State the purpose of decompression lever in a single cylinder, four stroke diesel engine. d) List out the methods of measuring frictional horse power of an engine. e) Depict the heat balance of a typical four stroke water cooled diesel engine in a Sankey diagram.	1
2.	What do you mean by knocking in SI engines? Explain the stages of combustion in SI engine.	1
3.	What do you mean by lubrication and why is it necessary for the engines? Discuss the wet sump and dry sump lubrication systems with neat sketches.	1
4.	A single cylinder, 4 stroke diesel engine gives the following test results: Load on brake drum 205N, Radius of brake drum 50 cm, speed 1000 rpm, friction power 1.8 kW, total fuel consumption 1.77 kg/h, calorific value of fuel 42000 kJ/kg. Find the brake thermal efficiency, mechanical efficiency and indicated thermal efficiency. If the brake mean effective pressure is 4.5 bar, find the swept volume.	2
5	A test was conducted on a 4-stroke, single cylinder SI engine having 7 cm diameter cylinder and 9 cm stroke length. The fuel supply to the engine is 0.065 kg/min. The brake power measurements are given below with constant speed of an engine. (i) With all cylinders firing = 16.9 kW (ii) Cut off at 1st cylinder = 8.46 kW (iii) Cut off at 2nd cylinder = 8.56 kW (iv) Cut off at 3rd cylinder = 8.6 kW (v) Cut off at 4th cylinder = 8.46 kW If clearance volume is 69.5 cm^3, determine the following. (a) Indicated Power (b) Indicated thermal efficiency (c) Relative efficiency. Assume the calorific value of fuel to be 43.5 MJ/kg.	2