Code No: 155SD **RA**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, February - 2022
THERMAL ENGINEERING – I
(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
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1.a) Briefly discuss the air-fuel requirements of a petrol engine from no load to full load.
b) What are the limitations of simple carburetor? [8+7]

2.a) Explain with neat sketch the exhaust gas analysis.
b) List the advantages of electronic ignition system over the conventional systems. [7+8]

3.a) Explain the significance of flame speed and its influence on combustion in S.I.engine.
b) What are the various causes for pre-ignition in SI engines? [8+7]

4.a) Explain the significance of Delay period and its importance in CI engines.
b) What are the various factors that affect delay period? [8+7]

5. A four-stroke, four-cylinder gasoline engine has a bore of 60 mm and a stroke of 100 mm. on test it develops a torque of 66.5 Nm when running at 3000 rpm. If the clearance volume in each cylinder is 60 cc the relative efficiency with respect to brake thermal efficiency is 0.5 and the calorific value of the fuel is 42 MJ/kg, determine the fuel consumption in kg/h and the brake mean effective pressure. [15]

6.a) Why morse test is not used for single cylinder engine? Describe the method of finding friction power using Morse test.
b) Explain how brake power can be evaluated by using Rope brake dynamometer. [8+7]

7. Derive an expression for the minimum work required for a two stage reciprocating air compressor with perfect inter cooling and neglecting clearance. [15]

8. Derive an expression for Efficiency, Work Ratio and Optimum Pressure Ratio for Simple Gas Turbine Cycle. [15]

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