Code No. 484/ CBCS

FACULTY OF ENGINEERING

B.E IV-Semester (CBCS) (Mech) (Main) Examination, May / June 2018

Subject: Applied Thermodynamics

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A and any five questions from Part –B

PART-A (20 Marks)

1. Classify compressors
2. Explain the use of intercooler in compressors
3. What is wet sump and dry sump lubrication.
4. Define specific fuel consumption.
5. Define Octane number.
6. What is ignition delay in engine combustion.
7. What are boiler mountings give examples.
8. What are supercritical boilers.
9. Sketch Rankine cycle
10. What is critical pressure ratio in nozzles.

PART-B (5X10=50 Marks)

11 (a) Derive the expression for work done in a single stage reciprocating air compressor and sketch P-V graph.
(b) Determine the size of the cylinder for a double acting air compressor 40kW indicated power, In which air is drawn in at 1 bar and 15^0C and compressed according to the law $PV^{1.2}$=constant to 6 bar. The compressor runs at 100rpm with average piston speed of 152.5 m/min .neglect Clearance.

12 (a) Explain with the help of a sketch the working of magneto ignition system.
(b) A single cylinder engine running at 1800rpm develops a torque of 8Nm. The indicated power of the engine is 1.8kw. Find the loss due to friction power as the percentage of brake power.

13 (a) Explain the stages of combustion in SI engine.
(b) Define phenomenon of knocking in CI engine and mention effects of knocking.

.14 (a) Explain with the help of neat sketch
(i)Economiser (ii) Superheater (iii) safety valve
(b) Differentiate between jet and surface condensers.

15 (a) Explain Rankine cycle with reheating.
(b) Steam is expanded in a set of nozzles from 10 bar and 200^0c to 5bar. What type of nozzle is it? Neglecting the initial velocity find minimum area of the nozzle required to allow a flow of 3kg/s. Under the given conditions. Assume that expansion of steam to be isentropic.

16 (a) What is the effect of clearance volume on efficiency of compressor
(b) sketch and explain diesel engine injection pump.

17 (a) Sketch any two types of combustion chambers for CI engine
(b) Sketch and explain lancashire boiler
(c) Explain the phenomenon of flow of steam through convergent- divergent nozzle.

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