

GANPAT UNIVERSITY
B. TECH SEM- IV (Marine)
REGULAR EXAMINATION- APRIL-JUNE 2017
2MR404-Heat Engine

TIME: 3 HRS**TOTAL MARKS :60**

- Instructions:** (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.

SECTION: I

- Q.1** (a) Write short note on Parson's Turbine (05)
(b) Explain the Heat Exchange Between Non- Black Bodies in detail. (05)

OR

- Q.1** (a) Derive the Equation for the conduction Through a Cylindrical Wall and Multi Cylinder Wall (10)

- Q.2** (a) Explain the Stefan-Boltzmann Law in detail. (05)
(b) Explain the Absorptivity, Reflectivity and Transmissivity in detail with neat Sketch. (05)

OR

- Q.2** (a) Explain Conduction, Convection and Radiation with Suitable Example. (10)

- Q.3** (a) Differentiate between Impulse and Reaction Turbine. (5)
(b) Explain the efficiency of constant volume cycle. (5)

SECTION: II

- Q.4** (a) The upper and lower temperature limits for an Otto cycle are 1500 K and 300 K respectively. What compression ratio is required to develop maximum work? Estimate maximum theoretical power developed by an engine working on this cycle when the air flow rated is 0.35 kg/min. where $C_v = 0.718$ $\gamma = 1.4$ (10)

OR

- Q.4** (a) Explain the Regenerative cycle steam power plant? Find the efficiency of the Regenerative Cycle with Use of T-s, H-s and P-v diagram. (10)

- Q.5** (a) Explain velocity diagram of simple impulse turbine. (05)
(b) Explain the Stefan-Boltzmann Law in detail. (05)

OR

- Q.5** (a) What is the degree of reaction in reaction turbine? (05)
(b) Explain velocity diagram of centrifugal compressor. (05)

- Q.6 How is the heat of steam converted into work in steam turbine. The data pertaining to an impulse turbine is as follows: steam Velocity = 500m/s, blade speed = 200m/s, exit angle of moving blade = 25° , Nozzle angle = 20° Neglect effect of friction. Find 1) inlet angle of moving blade 2) exit velocity and direction 3) work done per kg of steam 4) axial thrust and power for a steam flow rate of 5 kg/s. 5) Blade efficiency. (10)

-----END OF PAPER-----