

II B.Tech I Semester Supplementary Examinations, May 2005**PRIME MOVERS AND PUMPS
(Electrical & Electronic Engineering)****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions
All Questions carry equal marks**

1. (a) How do you classify the turbines based on direction of flow? Give examples.
(b) Define:
 - i. Hydraulic efficiency.
 - ii. Mechanical efficiency.
 - iii. Overall efficiency of a turbine.
2. (a) What is a reciprocating pump? Elaborate.
(b) A single acting reciprocating pump has a plunger diameter of 250mm and stroke of 350mm. If the speed of the pump is 60 rpm and it delivers $0.2\text{m}^3/\text{sec}$ of water. Find the theoretical discharge, coefficient of discharge and the slip.
3. (a) Explain heads and efficiencies of a centrifugal pump.
(b) What is priming? Explain its necessity?
4. (a) Derive an expression for the air standard efficiency of the Joule cycle in terms of pressure ratio.
(b) An open cycle gas turbine power plant takes air at 1 bar and 15°C and compresses it to 5 bar. The maximum temperature of the cycle is limited to 800°C . The hot gases expand to 1 bar in the turbine and then are exhausted to atmosphere. Determine the power developed by the turbine plant and the thermal efficiency if the airflow is 1kg/s .
5. (a) Why two stroke SI engine is very popular with motorcycle and scooters.
(b) Discuss the relative characteristics of a two stroke and a four stroke cycle engines.
6. (a) Describe with a neat diagram, the construction and working of a Stirling boiler.
(b) What are the salient features of high pressure boilers.
7. (a) What is the principle of operation of simple impulse steam turbines?
(b) Show a diagrammatic view of a simple impulse steam turbine and explain its constructional features.
8. (a) Why the gas turbines are classified as external combustion engines.
(b) By means of schematic diagram, explain the working of closed cycle gas turbine
