Code No: NR210201 **NR**

II B.Tech I Semester Supplementary Examinations, November 2005
PRIME MOVERS AND PUMPS
(Electrical & Electronic Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain why the pressure inside the draft tube at the inlet is less than atmospheric pressure.
   (b) Distinguish between impulse and reaction turbines. [8+8]

2. A single acting reciprocating pump, running at 60 r.p.m. delivers 0.008 m^3/sec of water. The diameter of the piston is 200 mm and the stroke length is 300mm The suction and delivery heads are 4.2m and 10.75m respectively. Determine: [16]
   (a) Theoritical discharge.
   (b) Coefficient of discharge.
   (c) percentage slip of the pump.
   (d) power required to run the pump.

3. (a) What are the different components of a centrifugal pump? Show them with the help of a neat sketch. [8+8]
   (b) What is the pressure at the eye of a centrifugal pump ? What is the limitation on this pressure?

4. At the commencement of an engine working on Otto cycle, pressure of air is 1 bar, temperature 20^0 C and volume 0.25 m^3. At the end of compression stroke, the pressure is 5 bar. If during the constant volume process, 100kJ of heat is added, determine. [16]
   (a) The pressure, temperature and volume at the end of each process.
   (b) Air standard efficiency.
   (c) Work done/ cycle.

   Assume C_v=0.718kJ/kg K; γ =1.4

5. (a) Classify I.C.engines with their applications. [8+8]
   (b) An engine develops 50 kW Brake Power. If its mechanical efficiency is 80%, what is the frictional power?

6. (a) Explain the main distinguishing factors of fire tube and water tube boilers. Discuss the merits and demerits of each type. [10]
   (b) Enumerate the factors which should be considered while selecting a boiler. [6]

7. (a) What is the principle of operation of simple impulse steam turbines? [6]

(b) Show a diagrammatic view of a simple impulse steam turbine and explain its constructional features. [10]

8. (a) Enumerate the advantages and disadvantages of gas turbines. [8+8]

(b) With the aid of a schematic diagram explain the working of a open cycle gas turbine.

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