3rd. 31

Exam.Code:0939
Sub. Code: 7041

1128

B.E. (Mechanical Engineering)
Third Semester
MEC-301: Applied Thermodynamics – I

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

a) Why compounding of steam turbines is done?

b) What is stage efficiency of a turbine? Give formulation.

c) Differentiate between boiler mountings and accessories?

d) What are the losses in steam turbines?

e) Differentiate between impulse and reaction turbines? (5x2)

UNIT – I

II. a) What is the effect of friction of the efficiency of the nozzle?

b) How the efficiency of rankine cycle improves with feed water heating? Explain using TS and HS diagrams and find relation for thermal efficiency. (4,6)

III. a) Write a note on metastable flow through nozzles.

b) An industrial steam power plant is supplied with steam at 80Bar 350°C and steam is discharged at atmospheric pressure of 712.5mm of Hg. Calculate thermal efficiency and turbine work for a steam flow rate of 2kg/s. Do not neglect pump work. (4,6)

IV. Prove that for 50% reaction turbine, the inlet and exit angles of moving and fixed blades are equal.

UNIT – II

V. a) Compare water tube boilers with gas tube boilers.

b) Explain the working of Lancashire boiler with labelled diagram. (3,7)

P.T.O.

VI. What are the methods used to improve the efficiency of rankine cycle, explain in detail with diagrams (10)

VII. A three stage turbine is supplied with steam at 0 bar and 350°C. The condenser pressure is 0.04bar. The intermediate pressures are 5 bar and 1 bar. Assuming efficiency of each stage to be 80%, determine: Adiabatic heat drop, reheat factor and internal efficiency of turbine representing the processes on TS and HS Diagrams. (10)

x-x-x