Code No: RR310303 | RR | SET-1

B. Tech III Year I Semester Examinations, December - 2011
THERMAL ENGINEERING – II
(MECHANICAL ENGINEERING)

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

Answer any five questions
All questions carry equal marks

1.a) Explain the regenerative cycle with the heat sketch?
b) In reheat cycle the initial steam pressure and the maximum temperature and 150bar and 550-centigrade respectively. If the condenser pressure is 0.1bar and the moisture at the condenser inlet is 5% and assuming ideal process determine
i) Reheat pressure ii) Cyclic efficiency iii) Steam rate. [8+8]

2.a) List out mountings and explain briefly.
b) Draw neat sketch of Benson Boiler and Explain briefly.
c) What is difference between economic and super heater? Why are they used in boiler? [5+5+6]

3. A convergent divergent nozzle for a steam turbine has to deliver 400 kg of steam per hour under a supply condition of 10 bar dry and saturated and a back pressure of 0.1 bar. Initial velocity of steam is 150m/s. Neglect friction. Find throat and outlet areas. [16]

4. A surface condenser fitted with separate air and water extraction pumps has a portion of the tubes near the air pump suction screened off from the steam so that the air is cooled below the condensate temperature. The steam enters the condenser at 38°C and the condensate is removed at 37°C. The air removed has the temperature of 36°C. If the total air infiltration from all sources together is 5kg/hr. Determine the volume of air handled by the air pump per hour. What would be the corresponding value of the air handled if a combined air condensate pump was employed. Assume uniform pressure in the condenser. [16]

5. A turbine is supplied with the steam pressure of 32bar and a temperature of 4100°C. The steam then expands isentropically to a pressure of 0.08bar. Find the dryness fraction at the end of expansion and thermal efficiency of the cycle. It the reheated at 5.5 bar to temp of 400°C and then expands isentropically to pressure of 0.08 bar, what will be the dryness fraction and thermal efficiency of the cycle? [16]

6.a) What is the compounding of steam turbine? Discuss various methods of compounding.
b) In a 50% reaction turbine stage running at 3000rpm the exit angle are 30 and inlet angle are 50% the mean diameter is 1m. The steam flow rate by 1000kg /minute and stage efficiency is 85%. Determine (i) power output of stage (ii) specific enthalpy drop in the stage (iii) percentage increase in relative velocity of the steam when it flows over the moving blades. [8+8]

7.a) Explain with neat sketch of open cycle gas turbine plant.
b) Enumerate the difference between open cycle gas turbine plant and closed cycle turbine plant. [8+8]

8.a) Where is rocket propulsion used? What are the kinds of rocket propellants?
b) Describe liquid propellant rocket engine with neat sketch. [8+8]

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Code No: RR310303 | RR | SET-2

B. Tech III Year I Semester Examinations, December - 2011
THERMAL ENGINEERING – II
(MECHANICAL ENGINEERING)

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

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All questions carry equal marks
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5.a) Explain with neat sketch of open cycle gas turbine plant.
b) Enumerate the difference between open cycle gas turbine plant and closed cycle turbine plant. [8+8]

6.a) Where is rocket propulsion used? What are the kinds of rocket propellants?
b) Describe liquid propellant rocket engine with neat sketch. [8+8]

7.a) Explain the regenerative cycle with the heat sketch?
b) In reheat cycle the initial steam pressure and the maximum temperature and 150bar and 550-centigrade respectively. If the condenser pressure is 0.1bar and the moisture at the condenser inlet is 5% and assuming ideal process determine
i) Reheat pressure ii) Cyclic efficiency iii) Steam rate. [8+8]

8.a) List out mountings and explain briefly.
b) Draw neat sketch of Benson Boiler and Explain briefly.
c) What is difference between economic and super heater? Why are they used in boiler? [5+5+6]

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Code No: RR310303 | RR | SET-3

B. Tech III Year I Semester Examinations, December - 2011
THERMAL ENGINEERING – II
(MECHANICAL ENGINEERING)

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

Answer any five questions
All questions carry equal marks
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1. A turbine is supplied with the steam pressure of 32bar and a temperature of 4100°C. The steam then expands isentropically to a pressure of 0.08bar. Find the dryness fraction at the end of expansion and thermal efficiency of the cycle. It the reheated at 5.5 bar to temp of 400°C and then expands isentropically to pressure of 0.08 bar, what will be the dryness fraction and thermal efficiency of the cycle? [16]

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b) In a 50% reaction turbine stage running at 3000rpm the exit angle are 30 and inlet angle are 50% the mean diameter is 1m. The steam flow rate by 1000kg /minute and stage efficiency is 85%. Determine (i) power output of stage (ii) specific enthalpy drop in the stage (iii) percentage increase in relative velocity of the steam when it flows over the moving blades. [8+8]

3.a) Explain with neat sketch of open cycle gas turbine plant.
b) Enumerate the difference between open cycle gas turbine plant and closed cycle turbine plant. [8+8]

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Code No: RR310303 | RR | SET-4

B. Tech III Year I Semester Examinations, December - 2011
THERMAL ENGINEERING – II
(MECHANICAL ENGINEERING)

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

Answer any five questions
All questions carry equal marks

1.a) Explain with neat sketch of open cycle gas turbine plant.
b) Enumerate the difference between open cycle gas turbine plant and closed cycle turbine plant. [8+8]

2.a) Where is rocket propulsion used? What are the kinds of rocket propellants?
b) Describe liquid propellant rocket engine with neat sketch. [8+8]

3.a) Explain the regenerative cycle with the heat sketch?
b) In reheat cycle the initial steam pressure and the maximum temperature and 150bar and 550-centigrade respectively. If the condenser pressure is 0.1bar and the moisture at the condenser inlet is 5% and assuming ideal process determine
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