Roll No.   Total No. of Pages : 02

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B.Tech. (ME)/(IE-2008/09 Batch) (Sem.–3rd)

APPLIED THERMODYNAMICS-I
Subject Code : ME-209
Paper ID : [A0805]

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. **Answer briefly :**

(a) What are the effects of knocking?

(b) Sketch process of formation of steam on a temp–heat input diagram.

(c) How do you classify boilers?

(d) What is the advantage of bleeding ?

(e) What is critical pressure ratio ?

(f) Name various methods of compounding steam turbine.

(g) Write the expression for maximum blade efficiency in a single stage impulse turbine.

(h) What do you understand by governing of steam turbines?

(i) What are the disadvantages of Jet condensers?

(j) How the air compressors are classified?

SECTION-B

2. Explain the phenomena of detonation in spark i

3. What are high pressure boilers? Draw a labelled

4. Explain the effect of friction on the performanc

5. What is meant by a reheat cycle ? When is rehea in a steam power plant?

6. Describe briefly the constructional and opera used to experimentally determine the calorific v

SECTION-C

7. Steam is available at 8 bar and 0.9 dry. Make dryness fraction of steam in each of the followi

(a) there is a loss of 125 kJ from the steam at

(b) the temperature of steam falls to 160°C.

(c) the steam expands to 3 bar pressure in a tu equivalent of 200 kJ/kg is done.

8. A three stage steam turbine is fed at 26 bar takes place at 0.05 bar. Interstage pressure efficiency for all the stages is 80%. Determine :

(a) runtime efficiency

(b) the quantity of steam at each stage

(c) workdone in kJ/kg at each stage

(d) efficiency ratio

(e) reheat factor.

9. 6800 kg of steam are condensed per hour and condenser is 12 kg per hour. The air pump su exhaust steam temperature is 32°C, the conden and the temperature at the air pump section is 2

(a) the mass of steam condensed in the air coo

(b) the volume of air in m^3 handled by the air pu

(c) the percentage reduction in air pump capac the air.