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Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Mechanical Engineering) (2018 Batch) (Sem.–4)

APPLIED THERMODYNAMICS

Subject Code : BTME-401-18

M.Code : 77546

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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 have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Write briefly :

a) What is Free Air Delivery?

b) Write the effects of various parameters on volumetric efficiency.

c) State the principle of combustion.

d) Define Pure Substance.

e) Define Degree of Superheat.

f) What is the function of nozzle?

g) Define Nozzle Efficiency.

h) Write the classification of steam turbine.

i) What are the functions of condenser in a steam plant?

j) What part is played by a cooling tower?

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SECTION-B

2. Discuss the need of multistage compression and write its advantages.

3. What is adiabatic flame temperature and how it is determined?

4. State the methods of improving the Rankine efficiency.

5. What is Critical Pressure Ratio? Discuss its significance and its effects on discharge.

6. Define the term 'Degree of Reaction' as applied to a reaction turbine. Show that for Parson's reaction turbine, the degree of reaction is 50%.

SECTION-C

7. Draw and explain the Carnot cycle and discuss its limitations.

8. The velocity of steam leaving the nozzle of impulse turbine is 1200 m/s and the nozzle angle is 20°. The blade velocity is 375 m/s and the blade velocity coefficient is 0.75. Assuming no loss due the shock at the inlet, calculate for a mass flow of 0.5 kg/s and symmetrical balding :

   a) Blade inlet angle

   b) Driving force on the wheel

   c) Axial thrust on the wheel

   d) Power developed by the turbine.

9. What are the methods of governing a steam turbine? Describe any one method of governing steam turbines.

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NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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