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

Total No. of Questions : 09

B.Tech.(Aerospace Engg.) (2012 Onwards) (Sem.–5)

# AEROSPACE PROPULSION-II

Subject Code : ASPE-305

M.Code : 71839

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

**Q1. Answer in short :**

a) Classify impeller vanes.

b) Define power input factor in centrifugal compressors.

c) Define multispoaling in gas turbine engines.

d) Define degree of reaction.

e) What is symmetrical bladings?

f) What is free vortex condition?

g) What is an adiabatic process?

h) What is the function of piston crowning in a two stroke engine?

i) Explain boundary layer separation.

j) Explain concept of prewhirl in centrifugal compressors.

## SECTION-B

Q2. Draw actual P-V diagram of a four stroke otto cycle engine and explain its working.

Q3. Explain the working of a turbofan engine with the help of a neat figure.

Q4. Classify combustion chambers. Write the important factors affecting combustion chamber design.

Q5. Explain the working of centrifugal compressor. Derive the relation for work done and pressure rise for it.

Q6. Write the types of turbines. Explain the working of an axial flow turbine with the help of velocity triangles and derive the relation for work output.

## SECTION-C

Q7. Explain the working of a solid propellant Rocket motor and write the steps for its design.

Q8. Describe the critical and supercritical, supersonic inlet operation with the help of neat figures.

Q9. An axial flow compressor with an overall isentropic efficiency of 85% draws air at 20°C and compresses it in the pressure ratio of 4 : 1. The mean blade speed and flow velocity are constant throughout the compressor. Assuming 50% reaction blading and taking blade velocity as 180 m/s and work input factor as 0.82, calculate :

a) flow velocity (axial)

b) Number of stages.



**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.**