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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**

#### 1. Answer in short :

- a) What is the function of connecting rod in an IC. engine?
- b) What is valve timing diagram?
- c) What is stochiometric air fuel ratio?
- d) Define polytropic efficiency.
- e) Define surging.
- f) Define slip factor.
- g) Define fore body drag.
- h) What is normal shock wave?
- i) Define inlet mass flow ratio.
- j) How much thrust is increased by using an afterburner?



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### **SECTION-B**

- 2. Describe the working of a two stroke petrol engine.
- 3. Explain the working of a brayton cycle and derive the work input relationship.
- 4. Explain the working of a typical combustion chamber for a jet engine.
- 5. Describe the following with reference to nozzle :
  - a) Over expanded and under expanded nozzles.
  - b) Thrust reversal.
- 6. Describe the working of a centrifugal compressor and find the expression for work done and pressure rise.

# **SECTION-C**

- 7. Write any one method of nozzle design with the help of neat figures.
- 8. Describe the working of a internal compression supersonic inlet. What is Buzz?
- 9. A ten stage axial flow compressor provides a total head pressure ratio of 5 : 1 with an overall total head isentropic of 87% when the inlet total head temperature is 288°K. The work is divided equally between the stages and work done factor is 0.85. Find air angles of a stage at the design radius where the blade speed is 215 m/sec. Assume the axial velocity as constant throughout the stage at 167 m/s and degree of reaction is 80%.

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.