Seventh Semester B.E. Degree Examination, June/July 2019 **Gas Turbine Technology**

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART – A

- a. With a neat sketch, explain the working of a turbotan engine and also mention the 1 (10 Marks) characteristics of a turbotan engine.
 - b. With the help of the energy distribution diagram, explain the performance characteristics of a turbo prop engine. List its advantages and disadvantages. (10 Marks)
- List the three basic types of burner systems and explain with its advantages and (07 Marks) disadvantages. (07 Marks)
 - b. What are the performance requirements of combustion chamber?
 - c. Explain the following:
 - Sound suppression (reduction) techniques in aircraft engine.
 - Convergent and divergent nozzle. ii)
 - Thrust reversers. iii)

(06 Marks)

- What are the characteristics that must be considered in selection of any metal used in gas (10 Marks) turbine engine? (10 Marks)
 - Write in detail about the heat ranges of metals for aero-engine applications.
 - Explain the interface of FADEC on an aircraft Jet engine and intracts with aircraft. (10 Marks)
 - What are the various components of a typical aircraft engine fuel system and starting system (10 Marks) of gas turbine engine? Explain.

PART - B

- With a neat sketch, explain transient performance of a aero gas turbine engine. (10 Marks)
 - Define wind milling and describe the process of wind milling in a turbojet engine. (10 Marks)
- Explain the gas turbine combustion testing performance and evaluation. (10 Marks) 6
 - What do you mean by compressor MAP? What results can obtained from it? (10 Marks)
- The following are the test data obtained after an engine run. Find the corrected value of the above is order that a valid comparison can be made RPM = 9465, EGT = 510°C, fuel flow = 1814 kg/h air mass flow = 90.7 kg/s, thrust = 4536 kg, TSFC = 0.400; barometric pressure = 102.6 kpa, standard day pressure = 101.3 kpa. Ambient (16 Marks) temp = 27.8°C standard day temperature = 15°C.
 - b. What is flying test bed and what are the advantages?
- What is data Aquisition system? How does it help in the engine testing and design factors (05 Marks)
 - What do you mean by test cell? What are the factors considered for design of test engine test (10 Marks) beds? Explain.
 - c. Explain the following:
 - Uncertainty analysis in engine testing
 - MASS and CUSUM plots of engine testing.

(05 Marks)

(04 Marks)