

USN

--	--	--	--	--	--	--	--	--	--

18AE644

Sixth Semester B.E. Degree Examination, July/August 2022
Gas Turbine Technology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What are the operating characteristics of jet engines? Write in detail their effect on thrust. (10 Marks)
b. Explain different methods of thrust augmentation. (10 Marks)

OR

- 2 a. With neat sketch, explain pressure, temperature and velocity changes across an engine. (10 Marks)
b. Mention the different components of after burner with sketch and explain the operation of after burner with its uses in aircraft gas turbine engines. (10 Marks)

Module-2

- 3 a. Explain the different characteristics of materials which finds good for use in aircraft gas turbine engines. (10 Marks)
b. What is FADEC and how it affects the engine? (10 Marks)

OR

- 4 a. Write short notes on the following:
i) Use of ceramic materials in gas turbine engine.
ii) Use of composite and super alloys in gas turbine engine. (10 Marks)
b. Explain typical oil system and their components. (10 Marks)

Module-3

- 5 a. Explain the fundamental starting process of a jet engine. (10 Marks)
b. Explain the combustor performance. (10 Marks)

OR

- 6 a. Define wind milling and describe the process of wind milling in a turbojet engine. (10 Marks)
b. Explain transient performance of a aero gas turbine engine. (10 Marks)

Module-4

- 7 a. Discuss the three off-design performance characteristics of compressors used in gas turbine engine. (10 Marks)
b. Derive an equation for maximum mass flow rate through nozzle of a gas turbine. (10 Marks)

OR

- 8 a. Explain the turbine testing and its performance evolution. (10 Marks)
b. Explain the various tests to which a jet engine combustor will be subjected to during its performance evolution. (10 Marks)

Module-5

- 9 a. Write a short notes on:
- i) Open air test bed.
 - ii) Ground testing of engine installed in aircrafts.
 - iii) Jet thrust measurement in flight.
 - iv) CUSUM plots. (10 Marks)
- b. What are the various preliminary flight rating tests? Explain. (10 Marks)
- OR**
- 10 a. What are the various uncertainties in measurements? (10 Marks)
- b. Briefly explain the instruments used in test cell for measurement of various parameters. (10 Marks)

* * * * *