



CBBCS SCHEME

15AE62

Sixth Semester B.E. Degree Examination, Aug./Sept.2020 Gas Turbine Technology

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Explain the difference between turbojet and turbofan engines. Draw the energy distribution of turbojet engine, with the help of neat sketch. (08 Marks)
b. Draw the pressure, temperature and velocity changes across a turboprop engine. (08 Marks)

OR

- 2 a. With a neat graph, explain variation of thrust against velocity of aircraft. (08 Marks)
b. What are the various types of burners? Why after burners are used? Explain. (08 Marks)

Module-2

- 3 a. What are the characteristics that must be considered in the selection of any metal for use in the gas turbine engines? Explain. (08 Marks)
b. Explain any 4 surface finishing processes. (08 Marks)

OR

- 4 a. With a neat sketch, explain working of a general FADEC system along with its interface. (08 Marks)
b. Explain the starting mechanism of an aircraft engine. (08 Marks)

Module-3

- 5 a. What is meant by Transient performance? (08 Marks)
b. What is wind milling of engines? Explain briefly turbo jet wind milling process. (08 Marks)

OR

- 6 a. What are the parameters monitored for engine performance monitoring? (08 Marks)
b. Mention the steps involved in starting of gas turbine engine. (08 Marks)

Module-4

- 7 a. Draw and explain the compressor map of axial flow compressor. (08 Marks)
b. Write a short note on :
i) Surge margin requirements ii) Surge margin stack up. (08 Marks)

OR

- 8 The observed measurements of a running engine in a case study are :
rpm = 9465 , EGT = 510°C , $W_f = 1814.4 \text{ kg/h}$, $W_a = 90.7 \text{ kg/s}$, $F_n = 4536 \text{ kg}$,
TSFC = 0.400 , Barometer reading = 102.6 kPa , Ambient temperature = 27°C. Correct the engine performance to the standard day conditions of 101.3 kPa and 15°C. (16 Marks)

Module-5

- 9 a. Explain a typical data acquisition system. (08 Marks)
b. Briefly discuss the MASS and CUSUM plots. (08 Marks)

OR

- 10 a. Explain the following engine testing's :
i) Altitude Test Facility (ATF) ii) Flying Test bed. (08 Marks)
b. What are the various preliminary flight rating tests? Explain. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.