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10AE74

Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018
Gas Turbine Technology

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. With neat sketch, explain the working of turbojet engine and also mention the characteristics of turbojet engine. **(10 Marks)**

b. Explain the differences between turbo prop and turbo fan engine. Write down the energy distribution of these engines with neat sketch and related graph. **(10 Marks)**

2 a. What are the performance requirements of combustion chamber? **(07 Marks)**

b. Differentiate between Impulsive and Reaction turbine. **(04 Marks)**

c. Explain the following : i) Sound suppression (reduction) techniques in aircraft engines. ii) Convergent – Divergent Nozzle iii) After – burner system. **(09 Marks)**

3 a. What are the characteristics that must be considered in selection of any metal used in gas turbine engine? **(10 Marks)**

b. Explain powdered metallurgy technique in manufacturing of gas turbine components. **(05 Marks)**

c. Explain the different types of surface treatment that is used in gas turbine materials. **(05 Marks)**

4 a. What you mean by FADEC? How does FADEC intracts with aircraft and FADEC intracts with engine? Explain. **(10 Marks)**

b. Explain starting system of gas turbine engine. Write the various (any 2) starter used for this purpose. **(05 Marks)**

c. What are the components required for a typical fuel system? **(05 Marks)**

PART – B

5 a. Explain the transient performance phenomena of engine. **(10 Marks)**

b. How the performance of single spool turbo prop engine is evaluated? Explain transient working lines during declaration, with suitable graph. **(10 Marks)**

6 a. What do you mean by compressor MAP? What results can obtained from it? **(10 Marks)**

b. Explain the gas turbine combustion testing, performance and evaluation. **(10 Marks)**

7 a. What you mean by Structural Integrity in Gas turbine engines? **(07 Marks)**

b. Explain the testing of Inlet distortions and surge test. **(06 Marks)**

c. Explain with neat sketch the working of Indoor air testing. **(07 Marks)**

8 a. What do you mean by test cell? What are the factors considered for design of test engine test beds? Explain. **(10 Marks)**

b. What is Data Aquestion System? How does it help in the engine testing and design factors analysis? **(05 Marks)**

c. Explain the following : i) Uncertainty Analysis in engine testing ii) Explain the typical MASS and CUSUM plots of engine testing. **(05 Marks)**

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