USN

**10AE74**

### Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
## Gas Turbine Technology

Time: 3 hrs.                                                                                              Max. Marks:100

**Note:** *1. Answer any FIVE full questions, selecting*
*atleast TWO questions from each part.*
*2. Assume the data if necessary.*
*3. Draw neat figures wherever necessary.*

### PART – A

1   a. By using a suitable diagram, explain in detail for any jet engine what is reason of placing lower and higher compressor and turbine in aircraft engine? **(12 Marks)**
    b. What is by-pass ratio, how does it supports the jet engine, explain with neat sketch. **(08 Marks)**

2   a. Define Thrust reverser. Explain with neat sketch different types of thrust reversers. Give its advantages. **(15 Marks)**
    b. Write a short note on thrust augmentation. **(05 Marks)**

3   a. What are the coating given to the turbine blades? **(06 Marks)**
    b. What are the advantages of a shrouded turbine blade? **(06 Marks)**
    c. Describe the exhaust system of a jet engine. **(08 Marks)**

4   a. Explain the types of controls in fuel system, step by step. **(08 Marks)**
    b. Define the following:
        i)   Overspeed governor.
        ii)  Bleed valves.
        iii) Fuel-oil cooler.
        iv)  Water-injection system. **(12 Marks)**

### PART – B

5   The observed measurements of a running engine in a case study are :
    Rpm = 9465 , EGT = $510^0$C , $W_F$ = 1814.4 kg/hr , $W_a$ = 90.7 kg/s , $F_n$ = 4536 kg ,
    TSFC = 0.400.
    Barometer readings = 102.6 Kpa , Ambient temp = $27^0$C. Correct the engines performance to the standard day conditions of 101.3 Kpa and $15^0$C. **(20 Marks)**

6   a. What is compressor MAP? **(08 Marks)**
    b. Pressure recovery at inlet. Describe. **(06 Marks)**
    c. What is the need for a nozzle in a turbine engine? **(06 Marks)**

7   a. Explain the engine trimming process. How it is carried out on different engines? **(10 Marks)**
    b. What are the various preliminary flight rating tests? Explain. **(10 Marks)**

8   a. Explain Engine test bed calibration. **(10 Marks)**
    b. List and explain how the parameters are measured in a test bed. **(10 Marks)**

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