

**B.E DEGREE EXAMINATIONS: NOV/DEC 2013**

Seventh Semester

**AERONAUTICAL ENGINEERING**

AER133: Gas Turbine Technology

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. What is the minimum bearing requirement in Jet Engine?
  - a) 5
  - b) 4
  - c) 3
  - d) 2
2. Which of the following engines has more efficiency?
  - a) Turbojet
  - b) Turboprop
  - c) Turbofan
  - d) Ramjet
3. What is the minimum pressure drop in combustion chamber?
  - a) 5%
  - b) 2%
  - c) Up to 4%
  - d) Up to 8%
4. Which materials are used in oil tank manufacturing?
  - a) Aluminum
  - b) Steel
  - c) Composite
  - d) Both a & b
5. Interruption of air flow due to turbulence in all the compressor blades is called as
  - a) Compressor surge
  - b) Compressor map
  - c) Compressor stall
  - d) Compressor choke
6. If the Fuel flow= 4000 lb/h; Thrust = 10000 lb; and Temperature correction factor = 1.022; Determine the TSFC.
  - a) 0.391
  - b) 0.6
  - c) 0.456
  - d) 0.356
7. If the temperater correction factor = 1.13 and Standard day temperature = 15<sup>0</sup>C. What will be the observed temperature?
  - a) 303 K
  - b) 250 K
  - c) 343 K
  - d) 383 K
8. What is the main parameter to be increased for thrust augmentation in after burner method?
  - a) Jetpipe temperature
  - b) Mass flow rate
  - c) Pressure ratio
  - d) Turbine inlet temperature



b) What are the manufacturing techniques used in the manufacture of Gas turbine component.

23. a) The following conditions are known about a running engine.  
RPM = 8565; EGT = 480°C;  $W_f = 1784.4$  kg/h;  $W_a = 89.7$  kg/s;  $F_n = 68$ KN;  
TSFC = 0.600; Barometric pressure = 122.6 kPa; Standard day pressure = 121.3 kPa; Ambient temperature = 35.3°C; Standard day Temperature = 25°C. Find out the corrected values.

**(OR)**

b) (i) Explain about design & off design performance of a gas turbine engine. (10)  
(ii) Write short notes on transient working line. (4)

24. a) Write detail notes on:  
(i) Combustion light up test.  
(ii) Compressor characteristics  
(iii) Turbine MAP.

**(OR)**

b) Write detail explanation about Compressor level testing and its performance evaluation with a help of operational graph.

25. a) Write detail notes on:  
(i) Ground testing of engine installed in aircraft  
(ii) Open air test bed  
(iii) Altitude Testing

**(OR)**

b) (i) Write detail notes on:  
(i) Performance reduction methodology (7)  
(ii) Accuracy & Uncertainty in measurements  
(ii) Explain the important factors to be considered in the design of engine test bed? (70)

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