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NPTEL

reviewer4@nptel.iitm.ac.in ▼

Courses » IC Engines and Gas Turbines

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Unit 12 - Week 9: Introduction to Various Aircraft Engine and Performance Parameters

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Course outline

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Assignment 09

The due date for submitting this assignment has passed.

As per our records you have not submitted this **Due on 2019-04-03, 23:59 IST.**
assignment.

1) Propulsive efficiency for aircraft engines is **1 point**

- (a) Total thrust Power / Change in K.E
 (b) Total Thrust / Total Inlet K.E
 (c) Inlet K.E / Total Change in K.E
 (d) Total Thrust / Total Heat Input

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) Total thrust Power / Change in K.E

2) Arrange these Aircraft in terms of decreasing order of propulsive efficiency **1 point**

1. Turbojet
2. Turbofan
3. Turboprop

- (a) 1-2-3
 (b) 2-3-1
 (c) 3-2-1
 (d) 1-3-2

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c) 3-2-1

3) Use of afterburner in case turbojet engine leads to **1 point**

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Performance Analysis of Brayton Cycle

Week 9: Introduction to Various Aircraft Engine and Performance Parameters

- Lec 1: Introduction and Performance Parameters of Propulsion System
- Lec 2: Basics of Various Aircraft Engine
- Quiz : Assignment 09
- Assignment 9 Solutions

Week 10: Components of Brayton Cycle Based Power Plant

Week 11: Components of Brayton Cycle Based Power Plant

Week 12: Components of Brayton Cycle Based Power Plant

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No, the answer is incorrect.

Score: 0

Accepted Answers:

(c) Increase in instant thrust and SFC

4) In case of Aircraft engines, decrease in enthalpy of the gas while flowing through Nozzle leads to **1 point**

- (a) Increase in Pressure
- (b) Increase in Kinetic Energy
- (c) Increase in internal energy
- (d) None of above

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) Increase in Kinetic Energy

5) Turbojet engines fly atas compared to turbofan engines. **1 point**

- (a) High altitude and low Mach number
- (b) High altitude and high Mach number
- (c) Low altitude and low Mach number
- (d) Low Altitude and high Mach number

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) High altitude and high Mach number

6) Helicopters are driven by **1 point**

- (a) Turbojet engine
- (b) Turboshaft engine
- (c) Turboprop Engine
- (d) Piston prop Engine

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) Turboshaft engine

7) Overall efficiency of the gas turbine based power plant is **1 point**

- (a) Overall efficiency = Propulsive efficiency / Energy conversion efficiency
- (b) Overall efficiency = Energy conversion efficiency / Propulsive efficiency
- (c) Overall efficiency = Energy conversion efficiency * Propulsive efficiency
- (d) Overall efficiency = Nozzle efficiency * Propulsive efficiency

No, the answer is incorrect.

Score: 0

Accepted Answers:

*(c) Overall efficiency = Energy conversion efficiency * Propulsive efficiency*

8) The amount of fuel required to generate a unit thrust is termed as **1 point**

- (a) Specific thrust

- (b) Specific fuel consumption
- (c) Thrust power
- (d) None of the above

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) Specific fuel consumption

Common Data for Questions Q9 to Q13:

A gas turbine plant draws in air at 1.013 bar, 283 K and has a pressure ratio of 5.5. The maximum temperature in the cycle is limited to 1023 K. Compression is conducted in an uncooled rotary compressor having an isentropic efficiency of 82 percent and expansion takes place in a turbine with an isentropic efficiency of 85%. A heat exchanger with an efficiency of 70% is fitted between the compressor outlet and combustion chamber. Air flow rate is 40 kg/s. Take specific heat at constant pressure as 1.005 kJ/kgK and specific heat ratio is equal to 1.4 for air and gases, find the following

9) Power consumed by the compressor in kW is

1 point

- (a) 8706
- (b) 8446
- (c) 9346
- (d) 9631

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) 8706

10) Actual turbine exit temperature in K is

1 point

- (a) 500
- (b) 628
- (c) 460
- (d) 687

No, the answer is incorrect.

Score: 0

Accepted Answers:

(d) 687

11) Power output in kW is

1 point

- a) 4862
- b) 4931
- c) 4772
- d) 4634

No, the answer is incorrect.

Score: 0

Accepted Answers:

c) 4772

12) Thermal efficiency of the cycle in percentage is

1 point

- (a) 25

(b) 21

(c) 30

(d) 39

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c) 30

13) Air-fuel ratio is, if the calorific value of fuel used is 45.22 MJ/kg

1 point

(a) 120

(b) 114

(c) 132

(d) 105

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b) 114

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