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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Introduction to Aerospace Engineering/Flight**
(course)

Announcements (announcements) **About the Course** (https://swayam.gov.in/nd1_noc19_ae05/preview)

Ask a Question (forum) Progress (student/home) Mentor (student/mentor)

Unit 3 - Week 1

Course outline

How to access the portal?

Preliminaries for the Course

Week 1

- Lecture 1 :
Course Layout and Brief Introduction of Course
Instructor (unit? unit=10&lesson=11)
- Lecture 2 :
Introduction to International Standard Atmosphere (ISA) (unit? unit=10&lesson=12)
- Lecture 3 :
Pressure, Temperature, Density and Viscosity Variation with Altitude in ISA

Assignment 1: Introduction to International Standard Atmosphere

The due date for submitting this assignment has passed. **Due on 2019-08-14, 23:59 IST.**
As per our records you have not submitted this assignment.

The following questions **may have more than one correct answers**. Read and analyse the question carefully before selecting the answer (s).

Marks will be awarded only if all the correct answers are selected.

No partial marks will be awarded.

- Radius of Earth=6360 km
- Air Density at Sea Level= 1.225 kg/m³
- Universal Gas Constant for air, R=287 J/kg
- Acceleration due to gravity, g=9.8 m/s²

1) Which sequence(s) of atmospheric layers is/are correctly arranged in the **1 point**
increasing order of their altitude?

Stratosphere < Thermosphere < Mesosphere < Ionosphere

Troposphere < Mesosphere < Stratosphere < Ionosphere

Troposphere < Thermosphere < Stratosphere < Ionosphere

Troposphere < Stratosphere < Ionosphere < Exosphere

No, the answer is incorrect.

Score: 0

(unit?
unit=10&lesson=13)

Lecture 4 :
Other Standard
Atmospheres
(unit?
unit=10&lesson=14)

Quiz :
**Assignment 1:
Introduction to
International
Standard
Atmosphere
(assessment?
name=89)**

Assignment 1
Solutions (unit?
unit=10&lesson=97)

Weekly
Feedback (unit?
unit=10&lesson=114)

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

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Accepted Answers:

Troposphere < Stratosphere < Ionosphere < Exosphere

2) In which layer(s) of the atmosphere do most of the commercial aircraft fly? **1 point**

- Troposphere
 Stratosphere
 Mesosphere
 Thermosphere

No, the answer is incorrect.

Score: 0

Accepted Answers:

Troposphere

3) Which of the following is/are the objective(s) of defining the International Standard Atmosphere (ISA)? **1 point**

- Simulation and analysis of aerospace vehicles
 Weather forecast
 Determination of performance of aerospace vehicles
 Turbulence modelling

No, the answer is incorrect.

Score: 0

Accepted Answers:

Simulation and analysis of aerospace vehicles

Determination of performance of aerospace vehicles

4) What happens to temperature as altitude increases from 27 km to 45 km? **1 point**

- It increases upto 40 km and then decreases.
 It increases.
 It decreases.
 It decreases upto 40 km and then increases.

No, the answer is incorrect.

Score: 0

Accepted Answers:

It increases.

5) Which of the following term(s) define(s) the True Altitude appropriately? **1 point**

- Altitude from the surface of the earth
 Altitude from the centre of the earth
 Altitude from the mean sea level
 Altitude as shown on the altimeter on the aircraft

No, the answer is incorrect.

Score: 0

Accepted Answers:

Altitude from the mean sea level

6) Which of the following appropriately describe(s) the temperature variation **1 point** in the Mesosphere as per the ISA?

- Temperature decreases as the altitude increases
- Temperature decreases until a certain altitude then increases.
- Temperature increases as the altitude increases.
- Temperature increases till a certain altitude and then decreases.

No, the answer is incorrect.

Score: 0

Accepted Answers:

Temperature decreases as the altitude increases

7) Which of the following altitude(s) is/are only relevant for Space vehicles ? **1 point**

True Altitude

- Absolute Altitude
- Pressure Altitude
- Geopotential Altitude

No, the answer is incorrect.

Score: 0

Accepted Answers:

Geopotential Altitude

8) Which of the following describe(s) the density variation in gradient layers **0 points** of ISA?

$$\frac{\rho_1}{\rho_2} = e^{\left(-\frac{g_0}{RT}\right)(h_2-h_1)}$$

$$\frac{\rho_1}{\rho_2} = \left(\frac{T_1}{T_2}\right)^{-\left(\frac{g_0}{LR}+1\right)}$$

$$\frac{\rho_1}{\rho_2} = \left(\frac{T_1}{T_2}\right)^{-\left(\frac{g_0}{LR}\right)}$$

$$\frac{\rho_1}{\rho_2} = \left(\frac{T_2}{T_1}\right)^{\left(\frac{g_0}{LR}+1\right)}$$

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$\frac{\rho_1}{\rho_2} = \left(\frac{T_1}{T_2}\right)^{-\left(\frac{g_0}{LR}+1\right)}$$

9) What is the density of ambient air at a geometric altitude of 28 km? **1 point**

1.216 x 10⁻²

4.062 x 10⁻²

2.466 x 10⁻²

1.304 x 10⁻²

No, the answer is incorrect.

Score: 0

Accepted Answers:

$$2.466 \times 10^{-2}$$

10 At which of the following geometric altitude (s) does the difference $h-h_G$ equals to 3% of the geopotential altitude h ? **1 point**

- 192 km
-
- 150 km
-
- 206 km
- 180 km

No, the answer is incorrect.

Score: 0

Accepted Answers:

192 km