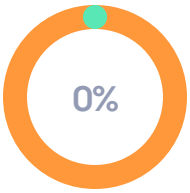
Don't give up now! Trust the process.

Your time: 1 min



Correct 0

Incorrect 38

Next steps

38 missed terms

Practice terms in Learn

Practice your missed terms more until you get them right. ›

Take a new test

Try another test to boost your confidence. ›

Your answers

1 of 38

Term

For isothermal flow, pressure is proportional to what power of density?

Give this one a try later!

✕ Skipped

Correct answer

✓ 1 (p = rhoRT, in isothermal flow, T = constant, thus p~T)

2 of 38

Term

How do static values of pressure, temperature and density vary when the gas undergoes compression, such as at a stagnation point? they all go _____.

Give this one a try later!

✗ Skipped

Correct answer

✓ up

3 of 38

Term

The critical pressure ratio required to achieve sonic condition is

Give this one a try later!

Skipped

Correct answer

p/p0 = 0.528

4 of 38

Term

Carl de Laval of Sweden was the first to make industrial use of converging-diverging _____ to achieve much higher RPMs in a steam turbine.

Give this one a try later!

Skipped

Correct answer

nozzle

5 of 38

Term

Is the Energy Equation very important in the study of compressible flows?

Give this one a try later!

Skipped

Correct answer

YES

6 of 38

Term

On physical grounds, at the same temperature, is the speed of sound higher in water than in air?

Give this one a try later!

Skipped

Correct answer

✓ Yes

7 of 38

Term

In an _____ flow, the total temperature remains constant.

Give this one a try later!

✗ Skipped

Correct answer

✓ adiabatic

8 of 38

Term

Higher the flow Mach number (M1) ahead of a normal shock, _____ the Mach number behind the shock/

Give this one a try later!

Skipped

Correct answer

lower

9 of 38

Term

Chuck Yeager's historic first _____ flight took place in the year 1947, only two years after the end of WWII.

Give this one a try later!

Skipped

Correct answer

supersonic

10 of 38

Term

Speed if sound in a gas is the speed of propagation of _____ pressure disturbances through the gas.

Give this one a try later!

Skipped

Correct answer

weak

11 of 38

Term

Prandtl relation can be written as: _____; where a* represents the speed of sound computed from flow being at _____ conditions.

Give this one a try later!

Skipped

Correct answer

✓ (a*)^2 = u1 * u2, sonic

12 of 38

Term

For isentropic flow, pressure is proportional to what power of density (give the symbol)?

Give this one a try later!

✗ Skipped

Correct answer

✓ gamma, p = c * rho ^ gamma

13 of 38

Term

A _____ perfect gas is one for which, CP(T), CV(T) are both function of T and not constant.

Give this one a try later!

Skipped

Correct answer

thermally

14 of 38

Term

How does entropy vary across a shock wave?

Give this one a try later!

Skipped

Correct answer

goes up (increase)

15 of 38

Term

What type of pressure remains constant in an isentropic flow?

Give this one a try later!

Skipped

Correct answer

stagnation or total

16 of 38

Term

T or F: When the flow Mach number ahead of a normal shock is increased infinitely, the flow density behind the shock also reaches infinity.

Give this one a try later!

Skipped

Correct answer

✓ False

17 of 38

Term

Give the equation for the speed of sound in a gas:

Give this one a try later!

✗ Skipped

Correct answer

✓ a = sqrt(gamma * R * T)

18 of 38

Term

Is the propagation of sound speed in air as an isentropic process?

Give this one a try later!

Skipped

Correct answer

YES

19 of 38

Term

Can we analytically solve the theta-beta-M relation for beta?

Give this one a try later!

Skipped

Correct answer

No

20 of 38

Term

A _____ perfect gas is one for which: cp and cv are constant.

Give this one a try later!

Skipped

Correct answer

calorically

21 of 38

Term

Rankin-Hugoniot relation across a normal shock gives us the pressure jump p2/p1 as function of (Mach number, M1; or density ratio rho2/rho1 across the shock; or entropy jump, s2/s1).

Select one

Give this one a try later!

Skipped

Correct answer

density ratio rho2/rho1 across the shock

22 of 38

Term

_____ flow refers to a constant-entropy flow.

Give this one a try later!

Skipped

Correct answer

Isentropic

23 of 38

Term

Has the shock wave system of an aircraft in flight ever been recorded?

Give this one a try later!

✕ Skipped

Correct answer

✓ Yes

24 of 38

Term

The _____ law of thermodynamics allows us to predict the direction that physical processes take.

Give this one a try later!

✕ Skipped

Correct answer

second (2nd)

25 of 38

Term

In an adiabatic flow, the total _____ remains constant.

Give this one a try later!

Skipped

Correct answer

enthalpy

26 of 38

Term

There is a portion of any curved shock wave that is _____ to the stagnation streamline.

Give this one a try later!

Skipped

Correct answer

normal

27 of 38

Term

We can not have an expansion shock (i.e., p2 < p1), because this would violate the _____ law of thermodynamics. The critical pressure ratio required to achieve sonic condition is _____.

Give this one a try later!

Skipped

Correct answer

second, 0.528

28 of 38

Term

Give the equation for calculating the Mach angle mu:

Give this one a try later!

Skipped

Correct answer

mu = arcsin(1/M)

29 of 38

Term

Tor F: The stagnation pressure across a normal shock (i.e., p02) is higher than the stagnation pressure in front of the shock (p01). This variation is the same as static pressure jump (i.e., p2 > p1).

Give this one a try later!

Skipped

Correct answer

✓ False

30 of 38

Term

We have a _____ perfect gas for T < 1000 K.

Give this one a try later!

✗ Skipped

Correct answer

✓ calorically

31 of 38

Term

At very high temperature where dissociation and ionization degree of freedom are important, then air's specific heat ratio gamma = Cp/Cv would be: increased, decreased, unchanged.
(gamma < 1.4; gamma > 1.4, always equal to 1.4)

(Select one)

Give this one a try later!

Skipped

Correct answer

decreased, gamma < 1.4

32 of 38

Term

The critical _____ ratio required to achieve sonic condition is _____ (Mach # = 1).

Give this one a try later!

Skipped

Correct answer

pressure, p/p0 = 0.528

33 of 38

Term

The Mach number downstream of a/an _____ shock wave is always subsonic.

Give this one a try later!

Skipped

Correct answer

normal

34 of 38

Term

In _____, the total stagnation pressure remains constant.

Give this one a try later!

Skipped

Correct answer

isentropic flow

35 of 38

Term

What type of pressure jump jumps up across a shock wave?

Give this one a try later!

Skipped

Correct answer

static pressure

36 of 38

Term

A/an _____ and reversible process is called isentropic.

Give this one a try later!

Skipped

Correct answer

adiabatic

37 of 38

Term

Does the second law of thermodynamics allow the process where the entropy for the system and surroundings decrease?

Give this one a try later!

Skipped

Correct answer

No

38 of 38

Term

A curved shock wave is also called a __ shock wave, usually created by blunt object in supersonic flight, such as the Space Shuttle Orbiter.

Give this one a try later!

Skipped

Correct answer

BOW