

Unit 14 - Week 12

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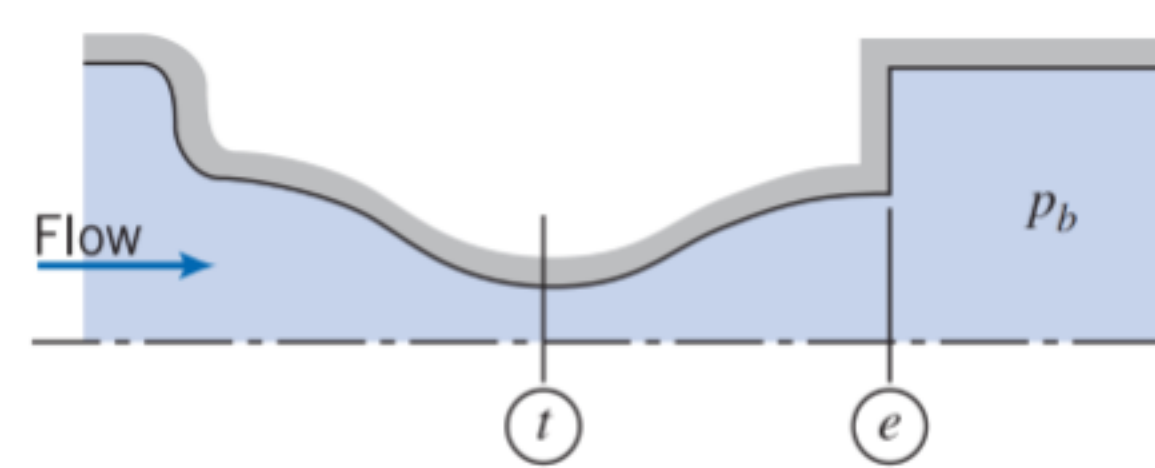
Assignment 12

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-10-23, 23:59 IST.

Common Data for Questions 1 to 5:

Air flows isentropically in a converging-diverging nozzle, with exit area of 0.001 m^2 . The nozzle is fed from a large plenum where the stagnation conditions are 350 K and 1.0 MPa (absolute). The exit pressure is 954 kPa (absolute) and the Mach number at the throat is 0.68 .



- 1) What is the air temperature at the nozzle throat? Choose the appropriate range for your answer. 1 point
- (A) 370-290 K
(B) 290-310 K
(C) 310-330 K
(D) 330-350 K
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: c

- 2) What is the pressure (absolute) at the nozzle throat? Choose the appropriate range for your answer. 1 point
- (A) 725-745 kPa
(B) 745-765 kPa
(C) 765-785 kPa
(D) 785-805 kPa
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: a

- 3) What is the air velocity at the nozzle throat? Choose the appropriate range for your answer. 1 point
- (A) 215-235 m/s
(B) 235-255 m/s
(C) 255-275 m/s
(D) 275-295 m/s
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: b

- 4) What is the exit Mach number? Choose the appropriate range for your answer. 1 point
- (A) 0.1-0.2
(B) 0.2-0.3
(C) 0.3-0.4
(D) 0.4-0.5
- a
 b
 c
 d

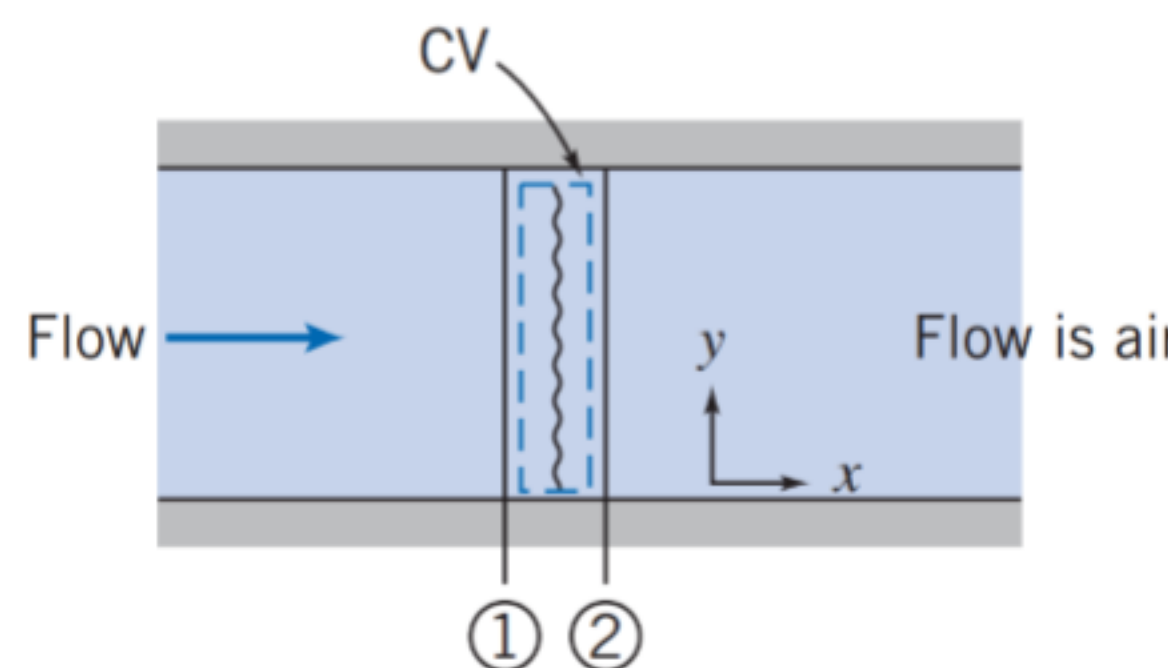
No, the answer is incorrect.
Score: 0
Accepted Answers: b

- 5) What is the area at the nozzle throat? Choose the appropriate range for your answer. 1 point
- (A) $1.5 \times 10^{-4} \text{ m}^2$ to $2.0 \times 10^{-4} \text{ m}^2$
(B) $2.5 \times 10^{-4} \text{ m}^2$ to $3.0 \times 10^{-4} \text{ m}^2$
(C) $3.5 \times 10^{-4} \text{ m}^2$ to $4.0 \times 10^{-4} \text{ m}^2$
(D) $4.5 \times 10^{-4} \text{ m}^2$ to $5.0 \times 10^{-4} \text{ m}^2$
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: d

Common Data for Questions 6 to 10:

A normal shock stands in a duct. The fluid is air, which may be considered an ideal gas. Properties upstream from the shock are $T_1 = 5^\circ\text{C}$, $p_1 = 65.0 \text{ kPa}$ (absolute), and $V_1 = 668 \text{ m/s}$.



- 6) What is the air temperature at section ②, just downstream of the shock? Choose the appropriate range for your answer. 1 point
- (A) 440-460 K
(B) 460-480 K
(C) 480-500 K
(D) 500-520 K
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: b

- 7) What is the air pressure (absolute) at section ②, just downstream of the shock? Choose the appropriate range for your answer. 1 point
- (A) 280-300 kPa
(B) 300-320 kPa
(C) 320-340 kPa
(D) 340-360 kPa
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: a

- 8) What is the air velocity at section ②, just downstream of the shock? Choose the appropriate range for your answer. 1 point
- (A) 200-220 m/s
(B) 220-240 m/s
(C) 240-260 m/s
(D) 260-280 m/s
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: c

- 9) What is the stagnation temperature at section ②, just downstream of the shock? Choose the appropriate range for your answer. 1 point
- (A) 430-450 K
(B) 450-470 K
(C) 470-490 K
(D) 490-510 K
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: d

- 10) What is the stagnation pressure at section ②, just downstream of the shock? Choose the appropriate range for your answer. 1 point
- (A) 335-355 kPa
(B) 355-375 kPa
(C) 375-395 kPa
(D) 395-415 kPa
- a
 b
 c
 d

No, the answer is incorrect.
Score: 0
Accepted Answers: b