DECOMPRESSION DIVING

Final Exam | A | English-Metric

Instructions: Select the best answer from the choices below.
Mark your answer on an SSI 100-Question Answer Form.

1. An M-Value is the maximum amount of:

A. Over-pressurization a compartment can tolerate without supersaturating
B. Decompression that can be conducted at a single depth
C. Time required for a tissue to absorb half of the total amount of inert gas that it would contain if it were completely saturated at a specified depth
D. Over-pressurization a compartment can tolerate without reaching an unacceptable degree of supersaturation

2. What is the partial pressure of nitrogen in air at 30 meters of salt water?

A. 2.37 ppN_2
B. 0.79 ppN_2
C. 1.15 ppN_2
D. 3.16 ppN_2

3. If a diver remains at a constant depth long enough, their body will saturate with:

A. Carbon monoxide
B. Air
C. Nitrogen
D. Oxygen

4. The primary purpose of a decompression gas is to:

A. Lower the partial pressure of inert gas in alveolar air and to maximize the desaturation gradient
B. Increase the partial pressure of inert gas in alveolar air and to maximize the desaturation gradient
C. Reduce the volume of back gas required to complete the dive
D. Provide a secondary gas supply that can be used in an out-of-gas situation

5. What condition is caused by increased exposures to elevated partial pressure of oxygen levels?

A. Decompression illness
B. Oxygen toxicity
C. Hypercapnia
D. Nitrogen narcosis

6. Signs and symptoms of CNS oxygen toxicity include:

A. Convulsions and twitching
B. Coughing and a burning sensation in the lungs
C. Cherry red lips and coughing
D. Numbness and tingling

7. Why is the risk of pulmonary oxygen toxicity low for divers in this program?

A. Dives have a planned maximum depth of 35 meters
B. Breathing gases below EAN 50 do not count toward the "oxygen clock"
C. The exposure time to a higher partial pressure of oxygen is relatively low
D. All answers are correct

8. Decompression sickness may occur when gas bubbles form:

A. During a fast descent
B. While switching to a decompression gas
C. While skip breathing
D. During the ascent

9. What predisposing factor(s) can increase the risks of decompression illness?

A. All answers are correct
B. Increased age and alcohol abuse
C. Extreme cold and prior injuries
D. Obesity and dehydration

10. Signs and symptoms of decompression illness include:

A. Ear sounds, nausea, twitching
B. Euphoria, sweating, shivering
C. Tingling, joint pain, numbness
D. Cherry red lips, blue nail beds, shivering

11. What is considered to be the cause of narcosis?

A. Interference with chemical neurotransmitters as they carry nerve impulses through the brain
B. Ascending too fast, causing gas bubbles to block blood vessels in the circulatory system
C. Breathing a gas that has a partial pressure of oxygen greater than 0.21
D. When the body loses heat faster than it can produce heat

12. In challenging conditions, at what depth does nitrogen narcosis generally begin to affect a diver?

A. 30 meters
B. 40 meters
C. 24 meters
D. 18 meters

13. As the body _____, blood vessels in the extremities constrict and the risk of _____ increases.

A. Cools, decompression sickness
B. Warms, decompression sickness
C. Sweats, oxygen toxicity
D. Moves, narcosis

14. Which condition occurs when the body experiences excessive heat loss?

A. Heat stroke
B. Vasodilation
C. Hypothermia
D. Hyperthermia

15. The air cells of a jacket-style buoyancy compensator make it easier to maintain:

A. A horizontal diving position underwater
B. Movement of gas to the diver's back
C. A horizontal body position on the surface
D. A vertical body position on the surface

16. The decompression regulator must have at least a:

A. First stage and second stage
B. First stage, second stage, and low-pressure inflator
C. First stage, second stage, short high-pressure hose, and submersible pressure gauge
D. First stage, short high-pressure hose, and submersible pressure gauge

17. Which type of clip is the most suitable for attaching stage cylinders?

A. Bolt snap
B. Boat snap
C. Snap hook
D. Bent-gate carabiner

18. Which statement is correct about stage cylinder rigging?

A. All answers are correct
B. The webbing is positioned in line with the valve outlet
C. The webbing is secured with a cam band or jubilee band
D. The upper P-clip is positioned at the "shoulder" of the cylinder

19. What information does a decompression diver write on their slate?

A. Emergency contact information of their buddy
B. The five-minute neurological exam
C. All answers are correct
D. Time-to-surface and minimum gas limits

20. Dive computers determine:

A. All answers are correct
B. The diver's direction and speed
C. The total amount of nitrogen required for a dive
D. The amount of inert gas that is absorbed

21. Gradient factors are used to:

A. Adjust the level of conservatism
B. Personalize the level of aggression
C. All answers are correct
D. Reduce the maximum tolerated supersaturation in the tissues

22. The low gradient factor (GF_{Low}) represents the percentage of the original Bühlmann M-Value that defines:

A. The residual nitrogen at the surface at the end of a dive
B. The depth of the final decompression stop
C. The beginning of the decompression stops
D. The duration of the final decompression stop

23. Using a gas-integrated computer:
A. Provides a visual warning when a diver needs to gas share with a buddy
B. Causes the transmitter to flash red when the diver's SAC rate exceeds 20 liters per minute
C. Provides a real-time indication of the remaining gas supply
D. Reduces the gas flow to the diver to conserve gas when the cylinder reserve is reached

24. What does a downward pointing triangle indicate on a dive computer?
A. An ascent is required to the decompression ceiling
B. An ascent is required to the surface
C. The diver passed the decompression ceiling and should descend immediately
D. The ascent is too fast

25. What does an upward pointing triangle indicate on a dive computer?
A. An ascent is required to the surface
B. An ascent is required to the decompression ceiling
C. The ascent is too fast
D. That a ceiling has been violated and that the diver should descend immediately

26. How do you calculate time-to-surface (TTS)?
A. TTS = Total runtime - Bottom time
B. TTS = Bottom time - Ascent time
C. No calculation is required, TTS is always 17 minutes
D. TTS = Final decompression stop time - Bottom time

27. _____estimates when the minimum cylinder pressure will be reached.
A. Time-to-surface
B. Minimum gas
C. Time-to-reserve
D. Ascent time

28. Time-to-surface represents:
A. The decompression time at each depth in minutes
B. The time it takes to directly ascend to the surface, not including deep stops or decompression stops
C. The ascent time, including a three-minute safety stop
D. The total time required before the diver can surface

29. What factor affects the selected level of conservatism during the dive planning process?
A. Cylinder capacity
B. Size of the dive team
C. Choice of nitrox breathing gas
D. Predisposing personal factors

30. A slower ascent rate causes:
A. More on-gassing into the slow tissue compartments
B. More off-gassing from the slow tissue compartments
C. An increased risk of nitrogen narcosis
D. An increased workload

31. A diver's gas consumption is influenced by:
A. Physical stressors like an increased workload
B. Carrying additional equipment
C. Mental stress due to poor visibility
D. All answers are correct

32. A dive is conducted in salt water to 35 meters for 12 minutes. The diver uses 72 bar from a 12-liter cylinder. What is their surface air consumption rate?
A. 16 liters per minute
B. 18 liters per minute
C. 20 liters per minute
D. 12 liters per minute

33. The "best gas mix" is:
A. A blend of oxygen and helium
B. Any blend of oxygen and nitrogen
C. The optimal blend of oxygen and nitrogen for a specified depth
D. EAN 32

34. Divers determine their best gas mix or maximum operating depth during the dive planning process:
A. All answers are correct
B. Using their dive planning software or dive computer
C. Using tables
D. Using a mathematical formula

35. The maximum operating depth of a gas is the depth:
A. At which nitrogen narcosis begins to have an effect
B. Where tissues reach complete saturation
C. Below which the partial pressure of oxygen exceeds an acceptable limit
D. At which tissue saturation begins

36. What is the best gas mix for a dive to 38 meters if the partial pressure of oxygen limit is 1.40?
A. EAN 32
B. EAN 29
C. EAN 27
D. Air

37. Which cylinder size is the most appropriate for a dive that requires 2450 liters of breathing gas?

A. 12-liter cylinder filled to 200 bar
B. 10-liter cylinder filled to 220 bar
C. 15-liter cylinder filled to 190 bar
D. 12-liter cylinder filled to 220 bar

38. The recommended minimum size for a decompression cylinder filled to 200 bar is:

A. 3-liter (S25)
B. 5.7-liter (S40)
C. 12-liter (S80)
D. 10-liter (S60)

39. "Minimum gas" is defined as:

A. The gas volume remaining in the diver's cylinder before they must start their ascent
B. The total gas volume in the diver's cylinder when they begin the dive
C. A quarter of the diver's total cylinder volume
D. 30 bar

40. What is the cylinder capacity of a 12-liter cylinder filled to 210 bar?

A. 2250 liters
B. 2520 liters
C. 18 liters
D. 2400 liters

41. What is the time-to-surface for a dive to 38 meters, with a 23-minute bottom time and a runtime of 42 minutes?

A. 17 minutes
B. 23 minutes
C. 19 minutes
D. 21 minutes

42. Why should the decompression gas be richer than the back gas?

A. It decreases the decompression time reducing the oxygen exposure
B. It minimizes the risks of decompression sickness
C. It minimizes the risks of pulmonary oxygen toxicity
D. It increases the rate of nitrogen being released from the tissues

43. What is the second part of the pre-dive procedure?

A. Environmental evaluation
B. Dive plan review
C. Pre-dive check
D. Buoyancy check

44. Why is the safety drill conducted at the start of every dive?

A. To verify the battery power of dive computer
B. All answers are correct
C. To verify the gas delivery systems are functioning properly
D. To verify the reel or spool is accessible

45. What is the hand signal for "Gas Switch"?

A. Tap the second stage of the decompression regulator three times with an index finger
B. Form a horizontal "V" with the fingers in front of the regulator, then rotate the fingers
C. Use a slashing motion across the throat with the flat of one hand
D. Make a fist, with the little finger extended vertically

46. What is the primary hazard of switching to another gas?

A. Switching to a cylinder that is closed
B. Switching below its maximum operating depth can cause central nervous system oxygen toxicity
C. Switching to a rich nitrox gas, causing nitrogen narcosis
D. Forgetting to switch the gas on the dive computer

Dive Planning

47. What is the average ascent depth for Dive Profile A?

A. 25 meters
B. 26 meters
C. 12 meters
D. 30 meters

48. What is the ascent time for Dive Profile A?

A. 3 minutes
B. 2 minutes
C. 5 minutes
D. 1 minute

49. What is the ascent gas volume for Dive Profile A?

A. 210 liters
B. 280 liters
C. 420 liters
D. 576 liters

50. What is the decompression gas volume for Dive Profile A?

A. 660 liters
B. 280 liters
C. 576 liters
D. 440 liters

Dive Profile A

Use the following information for the dive planning questions:

Dive Parameters

- Ascent rate: 10 meters per minute
- Individual SAC rate (both divers): 20 liters per minute

Depth (meters)	Time (minutes)
38	25
12	2
9	3
6	5

Formulas

Average ascent depth = (Maximum depth + Depth of the first decompression stop) / 2

Ascent time = (Maximum depth - Depth of first decompression stop) / (10 meters per minute)

Ascent gas volume = Combined SAC rate * Average ascent depth * Ascent time

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Decompression gas volume = Individual SAC rate * First decompression stop * Total decompression time

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100 QUESTION ANSWER FORM

Program Name	
Student Name	Date (DD/MM/YY)
SSI Pro Name	SSI Pro Number
Student Signature (After exam has been corrected and reviewed with the SSI Pro)	Grade

1. Ⓐ Ⓑ Ⓒ Ⓓ	26. Ⓐ Ⓑ Ⓒ Ⓓ	51. Ⓐ Ⓑ Ⓒ Ⓓ	76. Ⓐ Ⓑ Ⓒ Ⓓ
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100 KEY

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100 QUESTION ANSWER KEY

1.	D	26.	A	51.	A	76.	A
2.	D	27.	C	52.	A	77.	B
3.	C	28.	D	53.	B	78.	A
4.	A	29.	D	54.	B	79.	D
5.	B	30.	A	55.	D	80.	B
6.	A	31.	D	56.	D	81.	B
7.	C	32.	A	57.	D	82.	D
8.	D	33.	C	58.	B	83.	A
9.	A	34.	A	59.	B	84.	B
10.	C	35.	C	60.	C	85.	D
11.	A	36.	B	61.	D	86.	B
12.	C	37.	D	62.	A	87.	D
13.	A	38.	B	63.	D	88.	B
14.	C	39.	A	64.	D	89.	D
15.	D	40.	B	65.	C	90.	D
16.	C	41.	C	66.	D	91.	C
17.	A	42.	D	67.	B	92.	D
18.	A	43.	B	68.	C	93.	A
19.	D	44.	C	69.	B	94.	B
20.	D	45.	B	70.	B	95.	D
21.	C	46.	B	71.	C	96.	A
22.	C	47.	A	72.	D	97.	B
23.	C	48.	A	73.	C	98.	D
24.	C	49.	C	74.	D	99.	C
25.	B	50.	D	75.	B	100.	C