R2867

Sub. Code
465201

P.G. DIPLOMA EXAMINATION, APRIL – 2025

Second Semester

Scuba Diving

SCUBA DIVING EQUIPMENTS AND COMMUNICATION

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. What happens to the buoyant force on an object as it is submerged deeper into water? (CO1, K2)

   (a) It increases with depth

   (b) It decreases with depth

   (c) It remains constant

   (d) It depends on the object's weight

2. At sea level, atmospheric pressure is approximately 1 atmosphere. What is the approximate pressure at a depth of 10 meters underwater? (CO1, K2)

   (a) 1 atmosphere

   (b) 2 atmospheres

   (c) 5 atmospheres

   (d) 10 atmospheres

3. How often should SCUBA cylinders undergo hydrostatic testing as per international safety standards? (CO2, K4)

(a) Every 1 year

(b) Every 5 years

(c) Every 10 years

(d) Only when damaged

4. Which part of the SCUBA regulator is responsible for reducing cylinder pressure to an intermediate level? (CO2, K4)

(a) First stage

(b) Second stage

(c) Pressure gauge

(d) Alternate air source

5. What is the safe ascent rate to avoid decompression sickness? (CO3, K4)

(a) 30 meters per minute

(b) 18 meters per minute

(c) 9 meters per minute

(d) 1 meter per minute

6. What is the recommended minimum air pressure to surface with? (CO3, K4)

(a) 20 bar (300 psi)

(b) 50 bar (700 psi)

(c) 100 bar (1400 psi)

(d) 200 bar (2900 psi)

7. Which material is commonly used in wetsuits to provide thermal insulation? (CO4, K4)

(a) Cotton

(b) Nylon

(c) Neoprene

(d) Polyester

8. What is the primary way divers lose heat underwater? (CO4, K4)

(a) Radiation

(b) Conduction

(c) Convection

(d) Evaporation

9. Dive computers typically use which type of algorithm to calculate safe dive profiles? (CO5, K4)

(a) Boyle's Law

(b) Haldane's decompression model

(c) Ideal Gas Law

(d) Archimedes' Principle

10. What equipment is necessary for a safe deep-water exit? (CO5, K4)

(a) Fins and gloves

(b) Dive computer and mask

(c) Surface buoy and ladder

(d) A safety line or tether

Part B (5 × 5 = 25)

Answer **all** the questions not more than 500 words each.

11. (a) Describe the relationship between pressure, volume, and density under water. (CO1, K2)

Or

(b) Explain Archimedes' Principle and its relevance to buoyancy management. (CO1, K2)

12. (a) What are the key features of SCUBA cylinders, and why are they important? (CO2, K4)

Or

(b) How should SCUBA equipment be cared for after a dive? (CO2, K4)

13. (a) Why is managing air important during a dive, and how is it monitored? (CO3, K4)

Or

(b) What is the importance of the buddy system in diving, and what checks are typically performed before a dive? (CO3, K4)

14. (a) Why does vision underwater differ from vision on land? (CO4, K4)

Or

(b) Why is sound perception different underwater compared to on land? (CO4, K4)

15. (a) What is the purpose of surface snorkeling and how does it benefit divers? (CO5, K4)

Or

(b) How does a diver computer assist divers during a dive? (CO5, K4)

Part C ($5 \times 8 = 40$)

Answer **all** the questions not more than 1000 words each.

16. (a) Explain the principles of buoyancy management and control in aquatic environments, including the factors that affect buoyancy. (CO1, K2)

Or

(b) Discuss the effects of increasing and decreasing pressure on a diver's body and equipment. (CO1, K2)

17. (a) Compare and contrast different types of SCUBA regulators and their features. (CO2, K4)

Or

(b) Describe the steps for the disassembly and care of SCUBA equipment after a dive. (CO2, K4)

18. (a) Elaborate on BWARF. (CO3, K4)

Or

(b) What steps should divers follow when gearing up for a dive, and how should they clear any diving materials? (CO3, K4)

19. (a) Discuss the factors contributing to heat loss in divers and the various types of thermal protection used to mitigate this loss. (CO4, K4)

Or

(b) Describe the principles of efficient motion in water for divers and the role of fins in enhancing under water movement. (CO4, K4)

20. (a) Describe the key techniques for a safe deep-water exit and explain why these are important for diver safety. (CO5, K4)

Or

(b) Explain the role of a diver computer in monitoring and enhancing dive safety and how it can be used effectively during a dive. (CO5, K4)

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R2868

Sub. Code
465202

P.G. DIPLOMA EXAMINATION, APRIL – 2025

Second Semester

Scuba Diving

SCIENCE OF SCUBA DIVING

(CBCS – 2022 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 1 = 10)

Answer **all** the following objective type questions by choosing the correct option.

1. Which system of the body is most directly affected by the physical demands of diving? (CO1, K2)

   (a) Nervous system

   (b) Cardiovascular system

   (c) Digestive system

   (d) Endocrine system

2. Which physical demand is unique to diving? (CO1, K2)

   (a) Endurance

   (b) Weightlifting

   (c) Managing buoyancy and pressure changes

   (d) Sprinting

3. What is the primary benefit of using enriched air (nitrox) during a dive? (CO2, K4)

(a) Increased dive depth

(b) Reduced nitrogen absorption

(c) Faster ascension rates

(d) Decreased oxygen supply

4. What is the meaning of a red and white dive flag? (CO2, K4)

(a) No diving allowed

(b) Diver down-stay clear

(c) Caution: underwater currents

(d) Shark sightings reported

5. Nitrogen narcosis typically occurs at depths greater than: (CO3, K4)

(a) 33 feet (b) 100 feet

(c) 16 feet (d) 6.5 feet

6. What is another name for decompression sickness? (CO3, K4)

(a) The Bends

(b) Nitrogen Narcosis

(c) Hyperoxia

(d) Hypothermia

7. The depth limit for Open Water Diver certification is: (CO4, K4)

(a) 12 meters (40 feet)

(b) 18 meters (60 feet)

(c) 30 meters (100 feet)

(d) 40 meters (130 feet)

8. How long should a safety stop be performed? (CO4, K4)

(a) 3-5 minutes

(b) 10 minutes

(c) 1 minute

(d) 7 minutes

9. What should a diver do if they experience nitrogen narcosis? (CO5, K4)

(a) Ascend to a shallower depth

(b) Descend further

(c) Breathe faster

(d) Signal the boat

10. Which signal is commonly used to indicate an emergency underwater? (CO5, K4)

(a) Thumbs up

(b) Waving both hands above the head

(c) Flat handheld up palm forward

(d) Slashing motion across the throat

Part B ($5 \times 5 = 25$)

Answer **all** the questions not more than 500 words each.

11. (a) How do rest and recuperation benefit divers? (CO1, K2)

Or

(b) Why is cardiovascular health critical for divers? (CO1, K2)

12. (a) Explain the purpose of navigation slates in diving. (CO2, K4)

Or

(b) Why are logbooks essential for divers? (CO2, K4)

13. (a) What are the causes of injuries due to changes in air pressure while diving? (CO3, K4)

Or

(b) How can divers prevent oxygen toxicity during dives? (CO3, K4)

14. (a) Explain the importance of using descent lines during boat diving. (CO4, K4)

Or

(b) Discuss the significance of depth limits (12M and 18M) for recreational divers and the associated risks of exceeding them. (CO4, K4)

15. (a) What is the importance of a pre-dive safety check? (CO5, K4)

Or

(b) What are the essential details to include when maintaining a SCUBA dive logbook? (CO5, K4)

Part C (5 × 8 = 40)

Answer **all** the questions not more than 1000 words each.

16. (a) Discuss the relationship between cardiovascular health and the prevention of decompression sickness in divers. (CO1, K2)

Or

(b) Explain the importance of physical fitness and conditioning for safe and effective diving. (CO1, K2)

17. (a) Discuss the types and uses of Surface Marker Buoys (SMBs) in diving operations. (CO2, K4)

Or

(b) Describe enriched air (nitrox) and its role in diving. Include its benefits and risks. (CO2, K4)

18. (a) Describe decompression sickness (DCS), its causes, symptoms and treatment methods. (CO3, K4)

Or

(b) Discuss nitrogen narcosis, its physiological effects on divers and ways to mitigate its risks. (CO3, K4)

19. (a) Discuss the importance of safety stops during ascension. (CO4, K4)

Or

(b) Explain the buddy system in diving and how it enhances diver safety. (CO4, K4)

20. (a) Describe the first aid procedures to be followed when a diver experiences decompression sickness (DCS). (CO5, K4)

Or

(b) What are the steps to take in the event of air supply emergency while diving? (CO5, K4)

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