

3 Hours

Total Marks: 100

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

Q.1 a. Select the correct alternative (Any six)**06**

1. IPN is one of the most deadly viral diseases in salmon. What does IPN stand for?
a. Infectious Planar Necrosis b. Infectious Placental Necrosis
c. Infectious Plant Necrosis d. Infectious Pancreatic Necrosis
2. Organisms that flow at the mercy of the sea current is called
a. Nekton b. Plankton c. Zooplankton d. Benthos
3. Ring shaped coral reef is called
a. Barrier Reef b. Straight Reef c. Fringing Reef d. Atolls
4. _____ is a method of active camouflage seen in marine animals such as firefly squid and midshipman fish, and in military prototypes, producing light to match their backgrounds in both brightness and wavelength.
a. Reflection b. Countershading c. Transparency d. Counter illumination
5. The zone is characterized by a relative lack of life is _____.
a. Abyssalpelagic b. Bathypelagic c. Mesopelagic d. Epipelagic
6. Which of the following molecular tool is used in order to study the carbon cycle?
a. FISH b. Isotope Margining
c. Stable Isotope Penetrating d. Stable Isotope
7. Domoic acid can be used as an _____ agent.
a. Anitallergic b. Antibiotic c. Antiviral d. Antiparasitic
8. _____ is a secondary metabolites produced by macro algae to survive extreme conditions
a. Xanthin b. Antacid c. Chlorophyll d. Terpene
9. The main polysaccharide present in red algae is _____.
a. Laminarins b. Agar c. Chitin d. Erythrose

Q.1 b. Answer the following questions: (Any Two)**14**

1. Explain challenges encountered while culturing marine bacteria and the novel culturing techniques used to overcome them.
2. Describe methods used microbial bioprospecting in marine environments
3. Give account of any three marine ecosystem and its functioning

Q.2 a. Select the correct alternative (Any six)**06**

1. The mode of action of Aplidine is _____.
 - a. Interrupt cell cycle at G1 and G2/M phases as a way to induce p53 – independent apoptosis
 - b. Binds covalently to DNA minor groove
 - c. Blocks N type voltage gated calcium channels
 - d. Binds to the vinca domain of tubulin and inhibits its polymerization
2. Squalamine was found to inhibit _____ and stop tumor growth.
 - a. Angiogenesis
 - b. Immune system
 - c. Lysosomal vacuolization
 - d. Depolymerization of tubulin
3. The marine enzyme _____ is derived from *Methanococcus jannaschii*.
 - a. Amylase
 - b. Acid phosphatase
 - c. Thermophilic protease
 - d. Vent polymerase
4. The marine derived drug used for eye drop formulation is _____.
 - a. Vidarabine
 - b. Ecteinascidin
 - c. Bryostatin 1
 - d. Squalamine
5. Cellulases are not used in _____.
 - a. Hydrolysis of lignocellulose
 - b. Biofuel generation
 - c. Tanning industry
 - d. Textile industry
6. _____ drug is secreted by *Elysia rufescens*.
 - a. Bryostatin 1
 - b. Halichondrin B
 - c. Kahalalide F
 - d. Squalamine
7. The marine enzyme _____ used as a drug of choice for children lymphoblastic leukemia.
 - a. Amylase
 - b. Acid phosphatase
 - c. L - asparaginase
 - d. Vent polymerase
8. Eribulin mesylate is the commercial name for the active marine derived drug _____.
 - a. Halichondrin B
 - b. Aplidine
 - c. Cytarabine
 - d. Bryostatin 1
9. After the controlled fermentation of the marine bacterium _____ which leads to ET-743 from cyanosfracin B.
 - a. *Pseudomonas fluorescens*
 - b. *Pseudomonas putida*
 - c. *Pseudomonas aeruginosa*
 - d. *Pseudomonas denitrificans*

Q.2 b. Answer the following questions: (Any Two)**14**

1. Explain in detail - Marine natural products in advanced clinical trials.
2. Elaborate on - Omega - conotoxin MVIIA - an analgesic for neuropathic pain.
3. Discuss cytarabine to treat meningeal leukemia and vidarabine as an ophthalmic, non - corticosteroid antiviral.

Q.3 a. Select the correct alternative (Any six)

06

1. _____ is a sulfated polysaccharide which has anti-cancer activity.
a. Fucoidan b. Glucosamine c. Lycopene d. Gelatin
2. A live microorganism which is beneficial for gut microflora and restricting the growth of disease-causing bacteria is referred to as a _____.
a. Prebiotic strain b. Probiotic strain
c. Opportunistic pathogen d. Avirulent strain
3. _____ is considered as the highest astaxanthin producing microalgae.
a. *Haematococcus pluvialis* b. *Dunaliella salina*
c. *Spirulina sp.* d. *Spirogyra sp.*
4. The term nutraceutical was coined by _____.
a. Stephen De Felice b. Hippocrates c. Aristotle d. El-Sohaimy
5. Laminarin exhibits _____ activity
a. antihypertensive b. antiinflammatory
c. c. antioxidant d. antimicrobial
6. Bioactive peptides usually contain _____ amino acid residues.
a. 30 to 50 b. 3 to 20 c. 100 to 200 d. 50 to 100
7. The pigment phycocyanin obtained from cyanobacteria is _____ in colour.
a. Green b. Blue c. Red d. Orange
8. _____ are rich sources of EPA and DHA.
a. Diatoms b. Salmon fish c. Sponges d. Bombay duck
9. _____ is the most common and representative marine sulphated polysaccharide.
a. histamine b. heparin c. fucoidan d. pentosan

Q.3 b. Discuss the following: (Any Two)

14

1. Role of fish and crustaceans as a potential source of functional food ingredients.
2. Biological role of proteins, peptides and amino acids derived from marine sources as functional food ingredients.
3. Nutraceutical Potentials and Applications of COS and COS Derivatives

Q.4 a. Select the correct alternative (Any six)

06

1. _____ are cosmetic products that have drug-like benefits that enhance or protect the appearance of the human body
a. Cosmeceuticals b. Pharmaceuticals
c. Nutraceuticals d. biopharmaceutical
2. _____ prevent oxidation of fats and oils and the active principles present in the cosmetic formulations
a. Active ingredient b. Antioxidants c. Thickeners d. Humectants
3. A sterol Linckoside with potential to act as a drug against neurodegenerative diseases is isolated from _____.
a. *Linckia laevigata* b. *Lessonia nigrescens*
c. *Lithothamnium calcareum* d. *Porphyra tenera*

4. _____ is the most valuable of the phycobiliproteins due to its intense and unique pink color, heat stability, and pH tolerant characteristics
 - a. phycocyanin
 - b. astaxanthin
 - c. phycoerythrin
 - d. allophycocyanin
5. Allergic diseases are caused by chemical or immunological activation of _____.
 - a. Dendritic cells
 - b. Mast cells
 - c. B Cells
 - d. T cells
6. According to the definition of cosmetics, which of the following is not a cosmetic product
 - a. Deodorant
 - b. Shampoo
 - c. Haircolor
 - d. Green tea
7. _____ is responsible for the prevention of the loss of water and electrolytes from the skin surface.
 - a. Stratum granulosum
 - b. Stratum lucidum
 - c. Stratum corneum
 - d. Stratum spinosum
8. _____ is a mixture of phospholipids acting as natural emulsifiers with traditional cosmetic use.
 - a. Alginates
 - b. Lecithins
 - c. Polyuronic acids
 - d. Carrageenans
9. The unique structure of _____ has shown a protective effect against β -amyloid peptides and is found in plaques in Alzheimer's disease.
 - a. Fucosterols
 - b. Oxysterols
 - c. Saringosterols
 - d. Dinosterols

Q.4 b. Give an account of the following questions: (Any Two)

14

1. General composition of a cosmetic product.
2. Skin-whitening activity and Anti-pruritic activity of marine components in cosmetics
3. Technological properties of ingredients from marine sources with cosmetic use

Q.5 Write Short notes on the following (Any four)

20

- a. Hydrothermal vents
- b. Salient features of Coral reefs.
- c. Halotolerance and organic solvent stability.
- d. Role of collagen and gelatin obtained from marine source in nutraceuticals
- e. Functional foods incorporating marine derived fish oils and fatty acids
- f. Treatments Based on Marine Resources