Name:

Enrolment No:

UPES

End Semester Examination Dec – 2024

Program Name: B.Sc. Microbiology **Semester : V**

Course Name: Marine Microbiology **Time : 2 hrs**

Course Code: HSMB 3030 **Max. Marks : 100**

Nos. of page(s): 2

Instructions:

Read all questions carefully and support your answers with labelled diagrams wherever necessary.

S. No.	Section A Short answer questions/ MCQ/T&F (20Q x 1.5M = 30 Marks)	Marks	COs
Q 1	Define Thermocline.	1.5	CO1
Q2	Define Halocline.	1.5	CO1
Q3	The following groups of plankton contain silicates in their cell-walls: (a) Diatoms (b) Dinoflagellates (c) Coccolithophores (d) Radiolaria and Diatoms	1.5	CO1
Q4	Define PAR.	1.5	CO1
Q5	List a hand-held sampler for measuring PAR.	1.5	CO1
Q6	Define Neuston.	1.5	CO1
Q7	List microbial metabolic processes that plays an important role to influence N cycling in oxygen minimum zones.	1.5	CO2
Q8	State the difference between net primary-productivity and gross primary productivity.	1.5	CO1
Q9	Enlist techniques that may be more suitable to study the vast majority of unculturable marine microrganisms.	1.5	CO2
Q10	State the importance of Viral shunt.	1.5	CO2
Q11	State 3 typical characetristics of marine fungi that dwell on the bottom of the oceans.	1.5	CO2
Q12	Define convective mixing.	1.5	CO1
Q13	Define Ocean gyres.	1.5	CO1
Q14	Define C export.	1.5	CO2
Q15	Mention an example of marine diazotrophic cyanobacteria.	1.5	CO1

Q16	The average counts of bacterioplankton in typical euphotic ocean waters is _____ cells.	**1.5**	**CO2**
Q17	_____ are single-celled saprotrophic eukaryotes (decomposers) that are widely distributed in marine ecosystems.	**1.5**	**CO2**
Q18	State the causative agent of paralytic shellfish poisoning.	**1.5**	**CO2**
Q19	Define Nektons.	**1.5**	**CO1**
Q20	Define Quorum Sensing.	**1.5**	**CO2**
	Section B **(4Qx5M=20 Marks)**		
Q1	Explain the difference between black smokers and white smokers and comment on food-chain of these habitats.	**5**	**CO1**
Q2	Describe the driving factors for thermohaline circulation and their implications for global climate.	**5**	**CO2**
Q3	Explain the purpose and functioning of CTD samplers.	**5**	**CO2**
Q4	Describe a method for measuring primary-productivity of seawater samples using 14C radiotracers.	**5**	**CO3**
	Section C **(2Qx15M=30 Marks)**		
Q 1	(a) Explain C and energy flow through the marine food chain. (5 Marks) (b) Outline how marine microrganisms plays a pivotal role in biogeochemical cycling of C and other nutrients. (5 marks) (c) Discuss the implications of climate warming and ocean acidication on marine food webs of the euphotic ocean. (5 marks)	**15**	**CO3**
Q2	(a) Classify coral-reefs based on their formations and structure. (4 Marks) (b) Explain the structure of coral polyps with help of a diagram. (5 Marks) (c) Discuss importance of symbiotic interactions between corals and endophytic dinoflagellates. (3 Marks) (d) Discuss importance of reefs and impacts of climate change on reef ecosystems (3 Marks).	**15**	**CO3**
	Section D **(2Qx10M=20 Marks)**		
Q 1	Describe the various zonations of the ocean with help of labelled diagram.	**10**	**CO1**
Q2	Describe various factors that typically controls formation of seasonal phytoplankton blooms and their impacts on food-web.	**10**	**CO2**