

Sardar Patel University, Vallabh Vidyanagar, Gujarat

M.Sc: Environmental Science and Technology

I Semester

Course: Environmental Biology and Restoration Ecology. Course no: P50/CEST/21

Date: 2nd November, 2017

Time: 10.00-1.00 pm.

Max.Marks: 70

- N.B: i. Draw neat and labelled diagrams wherever necessary to score full marks.
ii. All questions compulsory and carries equal marks.

I. Answer the following multiple choice questions

(8 X 1)

1. In secondary succession first developed Community is
a. Pioneer community b. Climax community c. Succession community d. Initiation community
2. Total number of Ramsar sites present in Gujarat
a. 21 b. 23 c. 25 d. None
3. Which one of the environment mentioned below is not considered as Coastal environment
a. Sand-dune b. Ditch c. Estuarine d. Lagoon
4. Give one example of a Plant for Viviparous characters
a. Mangrove b. Avicenia c. Parthenium d. Tectona
5. The following one is not the characteristic of the Community
a. Species diversity b. Dominance c. Succession d. Age
6. Presence of following association is a characteristic of rich diversity of a community
a. Lianas, b. Epiphytes c. Lichens d. All
7. Telescope eyes present in
a. Fish b. Jelly fish c. Mollusks d. Crustacea.
8. Based on temperature, lentic are divided in to following zones;
a. Epilimnion, metalimnion and hypolimnion
b. Epilimnion, thermocline and hypolimnion
c. Epilimnion, Littoral, metalimnion, and hypolimnion
d. Epilimnion, metalimnion, thermocline and hypolimnion

II. Answer Any Seven of the following

(7 x 2)

- a) Key stone and foundation species
- b) Predation
- c) IVI
- d) Grazing Food chain
- e) Ecology and Environment

- f) Physical conditions of Lotic environments
- g) Biotic communities of Lentic
- h) Jaccards similarity index
- i) Estuary

III.A. 'Light is a limiting and inhibiting factor on the growth and life stages of plants and animals' Explain. (6)

III.B. Enumerate biotic relationships in which both the organism get benefit in the ecosystem (6)

OR

III.B.i. Describe any Two methods to determine productivity (3)

III.B.ii. Write a note on Ecological Pyramids (3)

IV A. What is 'Biological Clock' and explain how various environmental gradients influence its different stages of Plant life cycle (6)

IV.B. Explain succession that starts from hydrological gradients to final climax community. (6)

OR

IV.B. Enumerate life-form diversity and characters of a population (3+3)

V.A. Define Wetland and describe the eco-restoration measures for degrading wetlands (6)

V.B. What are limiting factors? Enumerate atleast FIVE limiting Physical and chemical factors of surfacewaters. (6)

OR

V.B.i. Explain the criterion used for wetlands to recognize under Ramsar sites. (3)

V.B.ii. Describe types, consequences and factors influencing the Eutrophication (3)

VI.A. Describe the interrelationships of salinity, tides, density, transparency and temperature of marine water. (6)

VI.B. What are Mangroves and discuss its characters and principles for conservation of Mangroves environments (6)

OR

VI.B.i. Write a note on degradation and occurrence of Polycyclic Aromatic hydrocarbons in the various environments (3)

VI.ii. Explain how coral reefs are bleached due to climate change and how construction of artificial coral reef is prepared. (3)

— X —

PS01CEST22: Air Pollution & Climate Change

Max. Marks: 70

[08]

Q.1. Multiple Choice Questions (Choose Correct Answer)

- (1) In atmosphere, the ratio of Oxygen and Nitrogen is
 (a) 1: 3.33 (b) 1: 3.77 (c) 1: 3.37 (d) 1: 3.73
- (2) Photochemical smog does not contain
 (a) HNO₃ (b) PAN (c) O₃ (d) HC
- (3) Phosgene is synonymous to
 (a) Carbonyl Sulphahte (b) Carbonyl Phospahte (c) Carbonyl Nitrate (d) Carbonyl Chloride
- (4) Following is a carcinogenic HC, which causes Hepatic Cancer.
 (a) Vinyl Sulphahte (b) Vinyl Phospahte (c) Vinyl Nitrate (d) Vinyl Chloride
- (5) At 20,000 ppm, Benzene causes
 (a) ENT infections (b) Lung cancer (c) CNS disorders (d) Death
- (6) Insoluble aerosols are carried to the _____ system of human body.
 (a) lymphatic (b) pneumatic (c) circulatory (d) respiratory
- (7) Vulnerability is _____ of things to be damaged by a hazard.
 (a) propensity (b) probability (c) possibility (d) None
- (8) _____ of land of India is vulnerable to severe earthquakes.
 (a) 12% (b) 58% (c) 68% (d) 8%

Q.2. Attempt followings (Any Seven)

[14]

- (1) Atmosphere as a resource
- (2) Causative factors for anthropogenic air pollution
- (3) CO₂ emission and its undesirable effects
- (4) Composition of air
- (5) Effects of atomic bombings
- (6) Enlist indoor air pollutants along with its sources
- (7) Enlist major classes of air pollutants
- (8) Enlist major disasters in India
- (9) PAP, OAP, CAP

Q.3. (a) Explain general effects of air pollution on humans with special reference to cardiac and pulmonary diseases. [06]

(b) Describe effects of NO_x and SO_x on plants, humans, and materials. [06]

OR

(b) Write a note on ozone (types, depletion, effects, recovery). [06]

Q.4. (a) Describe man-made sources of air pollution with suitable examples. [06]

(b) Discuss general effects of air pollution on plants, animals, and materials. [06]

OR

(b) Write a note on effects of HC and PM on plants, humans, and materials. [06]

Q.5. (a) Discuss formation of PCS and process of acid deposition. Add a note on general as well as specific effects of acid rain on forest decline. [06]

(b) Write a detailed note on aeroallergens with special emphasis on RAST. [06]

OR

(b) Tabulate: 1. Main sources of air pollution 2. Types of air pollutants (Gaseous) [06]

Q.6. (a) Describe principles of disaster management in detail. [06]

(b) Short Notes: Flood, Drought, Cyclone, Landslide, Avalanche [06]

OR

(b) Short Notes: Nodal agencies for DM in India, Flowchart of DM continuum, National Disaster Management Structure (NDMS) [06]

[49]

SEAT No. _____

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY,

M.Sc. Environmental Science and Technology (EST)
 I Semester Max. Marks: 70
 8th November, 2017 10.00 a.m. to 1:00 p.m.
 PS01CEST23: Water Pollution and Control Technology

Q.1. Multiple Choice Questions (Choose Correct Answer) [8 X 1]

- 1.) Water whose color is partly to suspended matter is said to have
 a) True b) Apparent c) Brackish d) none
- 2.) Scabies is a water
 a) Borne b) Related c) Washed d) Based
- 3.) Temporary hardness is caused by
 a) Nitrate & Sulphate b) Carbonate c) CaSO₄ d) all of the above
- 4.) Pre-Chlorination improves
 a) Quality b) Strainer c) Gravel d) Mesh
- 5.) is removed by the Oxidation process in case of aeration treatment.
 a) Taste and Odour b) Iron & Manganese c) CO₂ d) Bacteria
- 6.) Confined aquifer is known as
 a) Water table b) Artesian aquifer c) Phreatic aquifer d) All
- 7.) Choose odd man out:
 a) Chlorination b) Ozonation c) Lime Soda Ash treatment d) UV Radiation
- 8.) Water contains excess of free available chlorine which is to be removed before acceptable consumers. The treatment is called.....
 a) Breakpoint chlorination b) De-chlorination c) Super chlorination d) Combined available residual chlorination

Q.2. Write a Short Note on followings (Any Seven). [7 X 2]

- a) Pre-chlorination treatment
- b) Explain the terms: Aquitard and Aquifuge
- c) Type of samples
- d) Water is polar solvent
- e) Clarifier treatment
- f) Porous Pipe Galleries
- g) Mechanisms of Disinfection
- h) Policy metering- Effect on Water demand

(2)

CPTO

i) Sources of Turbidity in water

Q.3. a) Given the following data, calculate the population at the end of four, five decades by Incremental increases method, decreasing rate method. [06]

Year	1940	1950	1960	1970
Population	80000	1,60,000	1,70,000	2,30,580

b). Explain the significance of the following from the point of view of water Quality criteria. [06]

i) Solids, ii) Chromium iii) Lead

OR

b.1) What are the different sources of Nuisance Organisms in water? [03]

b.2) Enumerate Symptoms in brief of the following diseases. [03]

i) Shigellosis ii) Bacillary dysentery

Q.4. a) Classify the different types of wells. Explain the different types of tube wells with Diagram [06]

b) 1 Write a note on Infiltration gallery. [03]

b) 2. Objectives of aeration treatment. [03]

OR

b) 1. How to control Saline water intrusion? Explain the different methods. [03]

b) 2. Write a note on Contour bund and stream augmentation [03]

Q.5.a). Describe about groundwater hydrology in detail with suitable diagram. [06]

b). Explain the coagulation Process. Discuss benefits and disadvantages of different coagulants used for water treatment. [06]

OR

b) What is the purpose of SSF? Explain the different types of material available for the filtration process. [06]

Q.6. a) Why backwashing is important for filter medium? Explain the Theory of Filtration Treatment. [06]

b) Explain the different water chlorine reactions in details. [06]

OR

b) Describe the different free available residual chlorination methods related to chlorination practices. [06]

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SEAT No. _____

No. of Printed Pages : 1 *SC*

SARDAR PATEL UNIVERSITY
M.Sc. (EST) (First Semester) Examination
Friday, 10 November, 2017
10.00 am to 1.00 pm

PS01EEST21: Environmental Chemistry and Geology

Max. Marks: 70

[08]

Q.1. Multiple Choice Questions (Choose Correct Answer)

- (1) Following is a denuded rock.
(a) Sedimentary (b) Igneous (c) Metamorphic (d) None
- (2) Distilled water contains no _____.
(a) TS (b) TSS (c) TDS (d) None
- (3) $TOM = TOC \times$ _____.
(a) 1.742 (b) 1.724 (c) 1.274 (d) 1.247
- (4) Ionized water contains more _____ ions.
(a) OH⁻ (b) H⁺ (c) Cl⁻ (d) Mg⁺
- (5) Horse latitude is confined to:
(a) 5° N-5° S (b) 5°-25° N & S (c) 30°-35° N & S (d) 25°-40° N & S
- (6) _____ rocks contain always fossils.
(a) Igneous (b) Sedimentary (c) Metamorphic (d) None
- (7) Sandstone morphs into _____.
(a) marble (b) quartzite (c) slate (d) gneiss
- (8) In river transportation process, medium particles travel downstream by bouncing along with a long riverbed. This process is known as _____.
(a) traction (b) suspension (c) solution (d) saltation

[14]

Q.2. Write a Short Note on followings (Any Seven).

- (1) Cleavage and luster properties of minerals
- (2) Difference between chemical and biochemical reaction
- (3) Difference between tributaries & distributaries
- (4) Enlist renewable raw materials for chemical synthesis
- (5) Explain: Infiltration, Leaching
- (6) Major components of soil
- (7) Sand dune formation
- (8) Soil permeability
- (9) Types of crust

- Q.3. (a) Write a detailed note on soil horizons. [06]**
(b) Describe soil textures in detail. [06]

OR

- Q.4. (b) Discuss soil-types based on water content with suitable examples. [06]**
(a) Write a note on soil problems and its solutions focusing on green revolution. [06]
(b) Write a detailed note on bulk density and particle density of soil. [06]

OR

- Q.5. (b) Mention classification of metamorphic rocks with suitable examples. [06]**
(a) Explain sorting by graphical representation. Mention three different modes of sediment transportation by running water. [06]
(b) Define geysers. How are they formed? Explain different geological works of groundwater. [06]

OR

- (b) Explain different types of erosional work by wind. How trend winds and prevailing westerlies are formed? Explain. [06]**

— X —
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- Q.6. (a) State and explain twelve principles of green chemistry. [06]
(b) Discuss synthesis of polycarbonate material by green method. Explain advantages of this method over conventional method. [06]

OR

- (b) How minerals are formed? Explain Moh's scale. Describe exfoliation and granular disintegration of rocks due to temperature changes. [06]