SPECIAL SUPPLE B.TECH/BT/7TH SEM/BIOT 4142/2018

ENVIRONMENTAL BIOTECHNOLOGY
(BIOT 4142)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Full form of EPA is
(a) Environmental protocol academy
(b) Environmental protection agency
(c) Ecology protection agency
(d) Ecology protection authority.

(ii) PAN is a/an
(a) underground water pollutant (b) primary water pollutant
(c) reserved water pollutant (d) secondary water pollutant.

(iii) Centrifugal scrubber is used for the removal of
(a) mist (b) fog
(c) particulate matter (d) gaseous air pollutant.

(iv) Infra red radiation is absorbed by
(a) sulphur dioxide (b) hydrocarbons
(c) nitric oxides (d) carbon monoxide.

(v) West-Gaeke colourimetric method is used to analyse
(a) sulphur dioxide (b) carbon monoxide
(c) nitrogen oxides (d) hydrocarbons.

(vi) Land farming, Composting, Biopiles, Bioreactors are
(a) bioremediation of soil — in situ
(b) bioremediation of soil — ex citu
(c) bioremediations
(d) bioremediation genomics.

(vii) What are the main sources of lead that contaminate many urban soils?
(a) vehicle exhaust from during of the twentieth century
(b) paint used on houses during much of the twentieth century
(c) pesticides sprayed to control tree diseases
(d) smoke from power plants and factories.

(viii) Phytoremediation can clean up polluted soils by using
(a) plants to take up and accumulate the pollutant so that it can be removed when the plant is harvested
(b) plant cover to prevent surface soil heating
(c) anaerobic bacteria to degrade toxic compounds
(d) all of the above.

(ix) _____ waste can be broken down by living things.
(a) Biodegradable (b) Glass
(c) Hazardous (d) Non-biodegradable.

(x) Ex-situ bioremediation involves
(a) degardation of pollutant by microbes directly
(b) removal of pollutants and collection at a place to facilitate microbial degradation
(c) degradation of pollutants by genetically modified pollutants
(d) none of these.

Group – B

2. (a) Write notes on Spray Towers.

(b) Explain how Catalytic oxidation is used to control air pollution.

(c) What do you mean by adsorption?

5 + 5 + 2 = 12

3. (a) Write notes on High Volume Filtration.

(b) How can you analyze nitrogen oxides in a sample?

(c) What is the effect of carbon monoxide in human health?

4 + 5 + 3 = 12

Group – C

4. (a) Write notes on Oxygen demanding wastes.

(b) What do you mean by BOD of waste water?

(c) How can you determine total organic carbon in a water sample?

5 + 2 + 5 = 12

5. (a) Briefly describe the working principle of Rotating Biological Contactor. Give diagram.

(b) The dissolved oxygen in an unseeded sample of diluted waste having an initial DO of 9.0 mg/L is measured to be 3.0 mg/L after 5 days. The dilution factor P is 0.030 and the reaction rate constant *k* is 0.22/day.
(i) What is the 5-day BOD of the waste?
(ii) What would be the ultimate carbonaceous BOD?
(iii) What would be the remaining oxygen demand after 5 days?

5 + 7 = 12

Group – D

6. (a) Write short note on Vermicomposting.

(b) How does temperature of the aerobic composting process changes with the time of progress of composting?

(c) Mention three important factors which influence the efficiency of composting.

5 + 4 + 3 = 12

7. (a) Write an essay on different sources of biomass that can be used to produce bioenergy.

(b) What is the composition of a typical biogas?

10 + 2 = 12

Group – E

8. (a) What are the major types of pesticides available in market? Give at least one example of each type.

(b) Describe the pathway of aerobic biodegradation of phenol from wastewater.

6 + 6 = 12

9. Short notes on
(i) Biostimulation (ii) Bioaugmentation.

6 + 6 = 12