



Seat No. \_\_\_\_\_

**HA-003-0491102**

**B. Sc./M. Sc. (Applied Physics) (Sem. X) (CBCS)**

**Examination**

**April - 2023**

**Nanotechnology and Environment : Paper-XIV**

*(New Course)*

**Faculty Code : 003**

**Subject Code : 0491102**

Time :  $2\frac{1}{2}$  / Total Marks : 70

**Instructions :**

- (1) All questions are compulsory.
- (2) Numbers in the right margin indicate marks.

**1** Answer the following questions (Any Seven) : **14**

- (1) Which are the existing technologies used for energy harvesting.
- (2) Give any two importance of biodiversity.
- (3) What are the advantages of single walled carbon nanotubes ?
- (4) Explain Cytotoxicity of TiO<sub>2</sub> nanoparticles in short.
- (5) What are Quantum dots ? Give some examples.
- (6) How can the environmental burden be reduced ?
- (7) Which are the non-point source pollutions.
- (8) Name the compound which can be utilized as catalytic desulfurization.
- (9) State some of the pressure driven membrane process used for treatment of waste water.
- (10) What are the main feature of biomaterials for medical applications ?

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

- (1) Write short notes on (i) Smog and pollution  
(ii) Ozone layer depletion.
- (2) (a) State major reasons for replacing previous technology **5**  
by nanoscience.  
(b) What are VOCs and CFC ? What is their role in **2**  
the environment ?

- (3) (a) How nanoscience can be useful in detecting pollution. **5**  
 (b) Explain in brief “Green Technology”. **2**
- (4) Describe the major applications of nanomaterials in the field of environment.
- 3** Answer the following questions : (any Two) **14**
- (1) Explain the toxic effects of Iron oxide nanoparticles.
- (2) Write a detailed note : Ecotoxicological Impacts of Nanomaterials.
- (3) Explain : Nanomaterial Interaction with Microbial Cell Components.
- (4) Explain the applications of Quantum dots in detail.
- 4** Answer the following questions (Any Two) : **14**
- (1) Explain in detail : Biomaterials and its applications.
- (2) Write a detailed note : Membrane fabrication using nanomaterials.
- (3) Write a detailed note : Nanomaterial based adsorbents for water and waste water treatments.
- (4) Write a note on : Fullerene based membranes.
- 5** Answer the following questions (Any Two) : **14**
- (1) Explain the role of nanotechnology in removal of volatile organic compounds and heavy metal ion.
- (2) Describe the mechanism of microbial desulfurization.
- (3) (a) Write short note on Process emission control with the approach of nanotechnology. **5**  
 (b) State some of the pressure driven membrane process used for treatment of waste water. **2**
- (4) Explain the role of nanotechnology in removal of volatile organic compounds and heavy metal ions.
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