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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Environmental Sciences) (Sem.–3) FUNDAMENTALS OF NANOTECHNOLOGY Subject Code : BSEN-302-20 M.Code : 90359 Date of Examination : 23-12-2022

Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- (a) Why nanomaterials show different properties in comparison to their bulk counterparts?
- (b) Discuss the concept of scaling.
- (c) Write down the properties of quantum well.
- (d) What is the effect of size on the band gap of semiconductor nanomaterials?
- (e) Define the term 'nano-lithography'.
- (f) Can we use proton or neutron for microscopy techniques instead of electron?
- (g) Write the two harmful effects of nanomaterials to human beings and environment.
- (h) Write two major causes of water pollution?
- (i) Write down the names of two nanomaterials can be used in fuel cells.
- (j) Define the term 'green nano-technology'.

SECTION-B

- 2. How electronic and magnetic properties of nanomaterials behave at nanoscale?
- 3. Discuss the structure of quantum dots and their applications.
- 4. Explain two different optical methods used for the characterization of nanomaterials.
- 5. Discuss the principle and working of nano-filters used for air purification.
- 6. Discuss the role of nanomaterials in the area of medicine.

SECTION-C

- 7. Describe briefly the various synthesis methods used for nanomaterials with suitable diagrams.
- 8. Describe the principle, construction and working of transmission electron microscope with suitable diagram.
- 9. Describe the role of nanomaterials as a solution to environmental problems particularly in the area of renewable energy.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.