M.Sc. (Physics) (CBCS Pattern) Fourth Semester CBCS

PSCPHYT15.2 - Core Elective E-2.3 - Nanoscience and Nanotechnology-II Paper-15

P. Pages : 1 **GUG/W/18/11416**

Time : Three Hours * 3 5 0 8 * Max. Marks : 80

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1. EITHER:-

a) How are the properties of photonic devices changed at nanoscale? Describe photoluminescence spectrum of nanophosphors materials. **8**

b) What are characteristics of LED lighting? Give the advantages of LED lighting over conventional lighting. **8**

OR

c) Describe the principle and application of phototherapy lamps. **8**

d) What is the role of nanomaterials in TL dosimetry? How the nanosize of the materials affect TL properties. **8**

2. EITHER:-

a) Explain Stoner-Wohlfarth model of magnetism and give its limitations. **8**

b) What are ferrofluids? Give their applications. **8**

OR

c) What is ferromagnetism? Discuss the effect of grain size on ferromagnetic domains. **8**

d) What is nanopore containment? Explain blocking temperature. **8**

3. EITHER:-

a) What is CMOS scaling? Explain the construction of nanoscale MOSFET. **8**

b) What is "Interconnect" technology? Explain the importance of inter connect? **8**

OR

c) What are top down and bottom up approach in constructing nanostructures materials? Describe bottom up approach for synthesizing nano materials in detail. **8**

d) How carbon nanotubes can be used in memory devices. **8**

4. EITHER:-

a) Explain how nanoceramic techniques are used for high temperature MEMS. **8**

b) Describe laser evaporation technique for synthesizing carbon nanotubes. **8**

OR

c) What is ball milling technique and how it is useful in synthesizing nanocomposite. **8**

d) Briefly explain Graphene structure of carbon. **8**

5. a) State application of LED's. **4**

b) Explain spintronics. **4**

c) What is quantum tunneling. **4**

d) Write short note on metallic nanocomposites. **4**

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