

INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH, KOLKATA  
DEPARTMENT OF CHEMICAL SCIENCES

ID4206: CHEMISTRY OF MATERIALS MID-SEMESTER EXAMINATION

Time: 60 min

18-02-2019

Marks: 20

- (1) Mention the equivalent planes of  $\{100\}$  in a body-centered cubic lattice. (1)
- (2) Draw  $T_+$  trigonal hole and  $T_-$  tetrahedral hole. (2)
- (3) Write the atomic coordinates of  $T_+$  and  $T_-$  tetrahedral voids in a face-centered cubic lattice. (2)
- (4) What is the coordination number of  $\text{Ca}^{2+}$  in  $\text{CaF}_2$ ? (1)
- (5) Why  $\text{MgAl}_2\text{O}_4$  is a normal spinel? (1)
- (6) How the octahedral voids are filled in  $\text{CdI}_2$ ? (1)
- (7) What do you understand by  $6_2$  symmetry operation? (1)
- (8) Explain  $n$  in the space group  $Pnma$ ? (1)
- (9) Why does CdSe nanoparticles smaller than 3 nm emit at higher energy compared to larger particles. Explain----- (3)
- (10) Explain the reason for the exceptional stability of the gold colloidal prepared by Faraday-- (1)
- (11) How does the UV absorption spectrum of a gold nanorods would look.? Explain----- (2)
- (12) Ag nanocubes were completely converted into Au hollow structures when exposed to gold salt., however, it is only partially replaced when exposed to Pd. Explain----- (2)
- (13) What are the advantages of dendrimers in the synthesis of Pd nanoparticles?----- (1)
- (14) What is the ideal synthetic condition to prepare non-spherical nanoparticles----- (1)

