Q.P. Code :22869

[Time: Three Hours] **[Marks:75]**

Please check whether you have got the right question paper.

N.B:
1. **All questions are compulsory.**
2. **Figures to the right indicate full marks.**
3. **All questions carry equal marks.**
4. **Use of Logarithmic table/Non-programmable calculator is allowed.**

Q.1 Explain any five of the following:- **15**

(a) Structure of PbO.
(b) Pervoskite structure.
(c) Applications of liquid crystals.
(d) Colour centres.
(e) Hoping conduction.
(f) Magnetic properties of illmenites.
(g) Method of descending symmetry.
(h) Normal modes of vibration in water.

Q.2 (a) Explain spinel structure with suitable example. **5**

OR

(a) Describe edge and screw dislocations. **5**
(b) Describe $Re0_3$ structure. **5**

OR

(b) Write informative note on grain boundary. **5**
(c) The average energy required to create Schottky defects in an ionic crystal is 2 eV. Calculate the ratio of number of Schottky defects at 800K and 400K. **5**

Q.3 (a) Discuss Arc technique for the synthesis of Inorganic materials with suitable example. **5**

OR

(a) Explain different factors which influence reactions of solids. **5**
(b) Describe high pressure method for the synthesis of Ignorance materials. **5**

OR

(b) State and explain Fick's laws of diffusion. **5**
(c) Write an informative note on Ruby laser. **5**

Q.4	(a)	Explain Seebeck effect and its applications	**5**
		OR	
	(a)	Discuss the magnetic properties of spin glasses.	**5**
	(b)	Describe ferroelectric materials with suitable examples and give their applications	**5**
		OR	
	(b)	Give short note on hysteresis loops.	**5**
	(c)	Elaborate on band theory.	**5**
Q.5	(a)	On the basis of MOT explain bonding in $B_6H_6^{2-}$.	**5**
		OR	
	(a)	Explain splitting of energy levels in different chemical environment of ligands.	**5**
	(b)	Discuss the correlation diagram for d^2 ions in tetrahedral field.	**5**
		OR	
	(b)	Give selection rules of IR.	**5**
	(c)	Elaborate on bonding in ferrocene on the basis of MOT and its magnetic nature.	**5**

****