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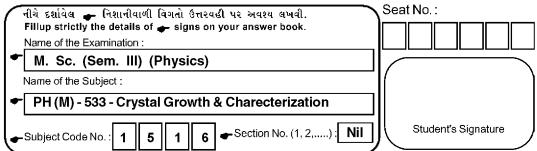
M. Sc. (Sem. III) (Physics) Examination March / April - 2015

PH (M) - 533 - Crystal Growth & Charecterization

Time:	Hours]	[Total Marks

Instructions:

1	1	1
1	1)



- (2) Figures to the extreme right side indicate full marks.
- (3) Symbols used have their usual Meaning
- (4) Assume data if required.
- 1 Write the Answer ANY TWO of the following (7×2=14) 14
 - (a) (i) What is Crystal?
 - (ii) Explain classification of crystal.
 - (iii) Write the applications of single crystal.
 - (b) (i) What is the Technological importance of crystals in Industry and Research area?
 - (ii) Discuss on History of crystal and production of crystal in would.
 - (c) Define solid phase for crystal growth. Derive the relation for Thomson equation for melt Growth.
- 2 Write the Answer ANY TWO of the following $(7\times2=14)$
 - (a) (i) What is differences between Bridgman Method and Czochralski Method for Crystal Growth.
 - (ii) Which method is used for growth of Sapphire Crystal? Why?

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- (b) (i) Explain the Crystal grown by Zone refining Method.
 - (ii) Write the Advantages and disadvantages of this Method.

	(c)	(i)	Explain KCl crystal grown by Czochralski Method.			
		(ii)	How to grown KCl crystal on (111) plane.			
3	Wri	Write the Answer ANY TWO of the following (7×2=14)				
	(a)	(i)	What is gel?			
		(ii)	What is the importance of temperature in solubility?			
		(iii)	What are the Advantages and disadvantages of gel?			
	(b)	(i)	Discuss on Crystal Grown by Hydrothermal method.			
		(ii)	Which parameters are affected on crystal grown by Aqueous solution method?			
	(c)	(i)	Explain KDP Crystal grown by solution method.			
		(ii)	Which types of crystals are grown by solution method?			
4	Wri	Write the Answer ANY TWO of the following (7×2=14)				
	(a)	(i)	Explain Vapor phase Epitaxy.			
		(ii)	What is the different between CVD and CVT?			
	(b)	(i)	Define vapor growth. Write the types of vapor growth method.			
		(ii)	What are the limitations of chemical vapor deposition method?			
	(c)	(i)	Explain CdTe thin film grown by Electrode position Method.			
		(ii)	Which type crystals are not growing by vapor growth.			
5	Wri	Write the Answer ANY TWO of the following				
	(a)	(i)	How to calculate the activation energy for grown crystal from Thermal Gravimetric Analysis (TGA)?			
		(ii)	Write the types of X-ray diffraction method.			
	(b)	(i)	Write the stages of qualitative Analysis.			
		(ii)	Discuss on qualitative and chemical Analysis for grown crystal.			
	(c)	(i)	What is the used on optical Microscopy for grown crystal?			
		(ii)	How to calculate Energy band gap and conductivity for grown material ?			