

# THAPAR UNIVERSITY PATIALA

End Semester Examination (May 2007)

## MS-106 Advanced Technique for Materials Characterization

NOTE; Attempt all questions in a sequence

Time : 3 hrs.

MM: 36

- 1.(a) What is AFM? What information do we get from it?  
(b) What are Kikuchi lines? What is its physical significance?  
(c) What is the typical diameter of probe in AFM? (2,3,1)
2. (a) With the help of ray diagram explain the working of TEM  
(b) What is Moire pattern in TEM? Explain with neat sketch  
(c) What is the typical size of fringes obtained for different planes in TEM? (2,3,1)
- 3.(a) What is dark and bright field microscopy? What are benefits of it? Explain with suitable illustration.  
(b) What are different techniques  
(c) What is etchant used for thinning of steel sample in TEM? (3,2,1)
4. (a) When two dislocations are moving in different direction which get arrested at some point, what will be their structural features observed under TEM? Draw it.  
(b) For HCP structure how the dislocation line will appear? Give reason for it.  
(c) How the fine screw dislocation will appear in TEM micrograph? Draw them. (2,2,2)
5. (a) How diffusion pump works in SEM? Explain.  
(b) What do you mean by filament life? How it can be enhanced?  
(c) What are SE and BSE? What is their role in imaging system? (3,2,1)
6. (a) The enclosed micrograph Fig.1(( a to d) pertain to a failed sample. Explain the features separately for each one.( Fig.1)  
(b) What does the arrow in fig.2( a & b) indicate? Which type of micrograph are these(a & b)?  
(c) What do the structural features of fig.2(c & d) are? Simply try to recognize them. (3,1½, 1½)





