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GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER - VIII (NEW SYLLABUS) EXAMINATION- SUMMER 2018

Subject Code: 2183901 **Date: 04-05-2018**

Subject Name: Nanolithography

Time:10:30 AM to 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Define Positive resist.	**03**
	(b)	Explain the chemistry of Acid- Catalysed DUV resist.	**04**
	(c)	Write a note on steps involved in adhesion promotion. with a diagram	**07**
Q.2	**(a)**	Define Negative resist.	**03**
	(b)	Explain the factors which affect the development of XRL.	**04**
	(c)	Explain how X-ray lithography works as a shadow printing technique.	**07**
		OR	
	(c)	Explain the phenomena of Poisson's spot in lithography.	**07**
Q.3	**(a)**	What does the measurement of residual thickness measurement indicate?	**03**
	(b)	Give the historical background for nanoimprint.	**04**
	(c)	Explain peeling demolding principle with a diagram.	**07**
		OR	
Q.3	**(a)**	Differentiate between the filling regime and planar regime.	**03**
	(b)	Give an account on use of nanoimprint in the 19th century.	**04**
	(c)	Explain in detail how fabrication of mould is done.	**07**
Q.4	**(a)**	Define CD Measurement.	**03**
	(b)	Explain the concept of local measurement and average local measurement in terms of CD	**04**
	(c)	Write a general note on Grating optical diffractometry.	**07**
		OR	
Q.4	**(a)**	What are the factors which affect the accuracy measurement in lithography.	**03**
	(b)	Explain how measurement reproducibility is important in terms of the CD.	**04**
	(c)	Give the principle of Scatterometry and explain the lightning scheme used in it.	**07**
Q.5	**(a)**	Mention the field where CD-SEM and X-SEM where use.	**03**
	(b)	Compare X-SEM v/s AFM 3D.	**04**
	(c)	Depending on needs explain the various type of lithography techniques in detail.	**07**
		OR	
Q.5	**(a)**	Write various techniques used in 1D, 2D and 3D.	**03**
	(b)	Give the difference between HRXRL and DXRL	**04**
	(c)	Evaluation of morphological damage generated by the primary electron beam from CD-SEM.	**07**

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