GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER–1 (NEW) EXAMINATION – WINTER 2018

Subject Code: 3710808   **Date: 04/01/2019**
Subject Name: Advanced Metrology and Experimental Techniques
Time: 02:30 PM To 05:00 PM   **Total Marks: 70**

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

Q.1	**(a)**	What is the difference between Accuracy and Precision ? State necessity of high precision measurement.	**07**
	(b)	Write note on "Inaccuracy due to thermal aspects."	**07**
Q.2	**(a)**	(i) Why Surface finish is important in engineering applications?	**03**
		(ii) Explain the following terms : Roughness, Waviness and Form	**04**
	(b)	With suitable example, discuss Experimental Design Protocol.	**07**
		OR	
	(b)	Which methods are used for improving accuracy? Discuss them briefly.	**07**
Q.3	**(a)**	Explain advanced techniques used in Metrology briefly.	**07**
	(b)	Explain Types of Experimental errors and their causes.	**07**
		OR	
Q.3	**(a)**	What do you mean by Co-ordinate Metrology? Explain CMM configurations briefly.	**07**
	(b)	What do you understand by Image enhancement? Explain gray scale models used for machine vision system.	**07**
Q.4	**(a)**	Explain overview of Image processing briefly.	**07**
	(b)	The following results are observed using pressure gauge : 2.96, 2.97, 2.98, 3.00, 3.01, 3.02, 3.03, 3.04, 3.05, 3.06 Pascal Calculate Arithmetic mean, Average deviation, Standard deviation and Variance.	**07**
		OR	
Q.4	**(a)**	Discuss how LASER interferometer can be used for distance measurement.	**07**
Q.4	**(b)**	Describe Chi-Square Test of Goodness of fit.	**07**
Q.5	**(a)**	State basic principle of Holography. Explain double exposure holographic interferometery.	**07**
	(b)	Discuss significant aspects of LASER Metrology.	**07**
		OR	
Q.5	**(a)**	Discuss different types of experiments.	**07**
	(b)	Explain in brief Probe sensor and Displacement device used in CMM.	**07**

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