

--	--	--	--	--	--	--	--	--	--



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Supplementary) - July, 2018

Regulation: IARE-R16

## PRECISION ENGINEERING

(CAD/CAM)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

### UNIT – I

1. (a) State the formula for tolerance grade for any diameter  $< 500\text{mm}$ . What are the considerations in the development of this? [7M]
- (b) A hole is bored to the limits of  $50.03$  to  $50.00\text{mm}$  diameter and the shaft which is to fit the hole is machined to the limits  $50.02\text{mm}$  to  $49.98\text{mm}$  [7M]
  - i. State the allowance for this fit and value for maximum clearance.
  - ii. If a limit and fit system was used for arriving the above dimensions, what was the fundamental deviation of hole? What type of shaft it could be?
2. (a) Explain with a neat sketch the various ways by which the tolerance frame is connected to tolerance feature. [7M]
- (b) Explain with a neat sketch the construction of main spindle for machine tool. [7M]

### UNIT – II

3. (a) Give a brief classification of datum system and explain two mutually perpendicular grouped datum planes. [7M]
- (b) Discuss the steps involved in computational of transnational accuracy. [7M]
4. (a) Explain with a neat sketch data system with pin and hole and list out any four advantages. [7M]
- (b) Write short notes on geometric analysis of spigot and recess pair. [7M]

### UNIT – III

5. (a) Discuss the relation between tolerance grades and machining process. [7M]
- (b) Briefly discuss about process capability metrics in design of tolerance work sheet. [7M]
6. (a) Explain geometric tolerance frame with a suitable example. [7M]
- (b) Write short notes on [7M]
  - i. Feature tolerance
  - ii. Cost aspect

#### UNIT – IV

7. (a) Explain the preparation of process drawings for various operations with a suitable example. [7M]  
(b) Elaborate different manufacturing considerations in component design. [7M]
8. (a) Define and explain the tolerance work sheet with a neat sketch. [7M]  
(b) Explain the design features to facilitate machining in detail. [7M]

#### UNIT – V

9. (a) Discuss the laser optical measuring system with a neat sketch. [7M]  
(b) Explain briefly about the working of 3 axis coordinate system. [7M]
10. (a) Explain the working system of Computational Machine Measurement(CMM) and its applications [7M]  
.  
(b) Explain in process measurement of position of processing on machine measurement of dimensional features. [7M]