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INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

M.Tech I Semester End Examinations (Regular) - February, 2017

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) Discuss the various errors in machine tools [7M]
 (b) Explain the concept of accuracy of machine tool [7M]
2. (a) Explain about spindle rotation accuracy [7M]
 (b) Discuss the significance of spindle rotation error for machine tools. [7M]

UNIT – II

3. (a) Discuss about grouped datum system with spigot and recess. [8M]
 (b) Differentiate between datum and datum systems [6M]
4. (a) Explain grouped datum plane with pins and holes with neat sketch. [8M]
 (b) Discuss about degrees of freedom for datum systems [6M]

UNIT – III

5. (a) Explain about process capability. [8M]
 (b) Distinguish between C_p and C_{pk} . [6M]
6. (a) Define fits. Describe the various types of fits in brief. [10M]
 (b) Differentiate between [4M]
 - i. tolerance and allowance
 - ii. maximum and minimum metal conditions

UNIT – IV

7. Determine the tolerances on the hole and the shaft for a precision running fit designated by $50H_7g_6$. [14M]
 50mm lies between the range 30-50mm

The fundamental deviation of g shaft $= -2.5D^{0.34}$

The multipliers for grades 7 and 6 are 16i and 10i

State the actual maximum and minimum size of the hole and shaft and maximum and minimum clearances

8. (a) What is meant by datum feature? and How single and two datum features are indicated on drawing? [8M]
(b) What are the uses of tolerance chart? [6M]

UNIT – V

9. (a) Write a brief note on laser as a means of alignment testing. [6M]
(b) Sketch and describe the optical system of the N.P.L flatness interferometer. [8M]
10. (a) Describe briefly about co-ordinate measuring machine (CMM). [8M]
(b) State the advantages and possible sources of errors in CMM. [6M]