

Hall Ticket No.

Question Paper Code: AME512



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-I

B.Tech V Semester End Examinations, November - 2019

Regulations: R16

PRECISION ENGINEERING

(Mechanical Engineering)

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) What are the test methods for radial spindle rotation error? [7M]
b) Write briefly different parallelism checking methods. [7M]
2. a) What are the different methods to check flatness? [7M]
b) Explain the NMTBA specification in NC system. [7M]

UNIT – II

3. a) Explain nature of deformation in a machine tool. [7M]
b) What is the significance of forced vibration in various machine tools? [7M]
4. a) Classify thermal effects in micromachining. [7M]
b) What are thermal deformations in machine tools? [7M]

UNIT – III

5. a) How nano materials are synthesized? [7M]
b) Write different micro-machining methods with sketches? [7M]
6. a) Explain top down approach in manufacturing of nano materials. [7M]
b) Explain constrained surface technique in micro-stereo lithography. [7M]

UNIT – IV

7. a) Explain different measurement methods in production processes. [7M]
b) What are the features of mechanical measuring systems? [7M]
8. a) Explain vertical resolution of profile instrument. [7M]
b) How laser interferometer works? [7M]

UNIT – V

9. a) What are the parameters that influence the resolution of DPN? [7M]
b) What are the steps to be followed in photo lithography? [7M]
10. a) Explain ion beam lithography with neat sketch. [7M]
b) Explain optical lithography with neat sketch. [7M]



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COURSE OBJECTIVES:

The course should enable the students to:

I	Understand the BIS code fits and tolerances for geometrical dimensioning and tolerance (GD &T).
II	Understand the principal application of different measuring instruments.
III	Summarize the application of latest manufacturing techniques (nano).

COURSE OUTCOMES (COs):

CO 1	Describes the General concept of accuracy, dimensional wear of cutting tools, clamping errors & setting errors, location of rectangular prism & cylinder, basic type of tests, measuring instruments used for testing machine tools, alignment tests, straightness, flatness, parallelism, squareness, Circularity, cylindricity.
CO 2	Describes the Influence of static stiffness, thermal effects, compliance of work piece, Influence of vibration on accuracy.
CO 3	Describes Top down and bottom up approach, development of Nanotechnology, precision and micro-machining, Stereo microlithography.
CO 4	Describes Nano Measuring Systems such as mechanical measuring systems, optical measuring systems, electron beam measuring systems, pattern recognition and inspection systems.
CO 5	Describes various types of Lithography such as Photolithography, nano lithography, electron beam lithography, ion Beam lithography, optical lithography, LIGA process, dip pen lithography, deep UV.

COURSE LEARNING OUTCOMES (CLOs):

AME512.01	Describes the General concept of accuracy,
AME512.02	Describe dimensional wear of cutting tools, clamping errors & setting errors
AME512.03	Describes how to location of rectangular prism & cylinder.
AME512.04	Describes basic type of tests and measuring instruments used for testing machine tools.
AME512.05	Describes the Influence of static stiffness.
AME512.06	Describes thermal effects and methods of decreasing thermal effects,
AME512.07	Describes the compliance of work piece
AME512.08	Describes the Influence of vibration on accuracy.
AME512.09	Describes the importance of Top down and bottom up approach,
AME512.10	Explains the development of Nanotechnology, precision and micro-machining, Stereo microlithography.
AME512.11	Explains the development of precision and micro-machining.
AME512.12	Explains the development Stereo microlithography.
AME512.13	Classify the various Nano Measuring systems.
AME512.14	Discuss the various Mechanical measuring systems
AME512.15	Discuss the optical measuring systems, electron beam measuring system.
AME512.16	Discuss the pattern recognition and inspection systems.
AME512.17	Classify the various Lithography's.
AME512.18	Describe the importance of Nano lithography & electron beam lithography
AME512.19	Describe the importance of ion Beam lithography & optical lithography
AME512.20	Explain LIGA Process, Dip Pen Lithography & deep UV

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No	Course Learning Outcomes			Course Outcomes	Bloom's Taxonomy Level
1	a	AME512.01	What are the test methods for radial spindle rotation error?	CO 1	Understand
	b	AME512.02	Write briefly different parallelism checking methods.	CO 1	Understand
2	a	AME512.03	What are the different methods to check flatness?	CO 1	Understand
	b	AME512.04	Explain the NMTBA specification in NC system.	CO 1	Understand
3	a	AME512.05	Explain nature of deformation in a machine tool.	CO 2	Remember
	b	AME512.06	What is the significance of forced vibration in various machine tools?	CO 2	Understand
4	a	AME512.08	Classify thermal effects in micromachining.	CO 2	Remember
	b	AME512.07	What are thermal deformations in machine tools?	CO 2	Understand
5	a	AME512.09	How nano materials are synthesized?	CO 3	Remember
	b	AME512.10	Write different micro-machining methods with sketches?	CO 3	Remember
6	a	AME512.11	Explain top down approach in manufacturing of nano materials.	CO 3	Understand
	b	AME512.12	Explain constrained surface technique in micro-stereo lithography.	CO 3	Understand
7	a	AME512.13	Explain different measurement methods in production processes.	CO 4	Remember
	b	AME512.14	What are the features of mechanical measuring systems?	CO 4	Understand
8	a	AME512.15	Explain vertical resolution of profile instrument.	CO 4	Understand
	b	AME512.16	How laser interferometer works?	CO 4	Remember
9	a	AME512.17	What are the parameters that influence the resolution of DPN?	CO 5	Understand
	b	AME512.18	What are the steps to be followed in photo lithography?	CO 5	Remember
10	a	AME512.19	Explain ion beam lithography with neat sketch.	CO 5	Understand
	b	AME512.20	Explain optical lithography with neat sketch.	CO 5	Understand

Signature of Course Coordinator

HOD, ME