



Measurements

Question 1

(15 Marks)

- 1- What are the objectives of metrology?
- 2- What are the methods of measurement?
- 3- Compare between the systematic and random errors.
- 4- What is the importance of standardization and standardizing organization?
- 5- Classify the instruments used for linear measurements.

Question 2

(15 Marks)

- 6- List the screw thread measuring instruments and explain in detail one of them.
- 7- With the help of sketches, Explain measurement of thread minor and major diameters.
- 8- With the help of sketches, explain measurement of thread effective diameter using one wire method.
- 9- List the parameters used to measure surface roughness. Define the surface roughness and waviness.
- 10- With the help of sketches, Define the terms, Rq, Rt, Ry, Pc, and Sm which used in surface roughness measurements.

Question 2

(15 Marks)

- 11- What are the form tolerances that could be measured by form tester?
- 12- With the help of sketches, Explain parallelism, perpendicularity, and angularity tests.
- 13- With the help of sketches, Explain roundness, straightness, and flatness.
- 14- What are the specific parameters the could be measured by form tester?
- 15- What are the considerations should be taken for form measuring?

Question 2

(15 Marks)

- 16- what are properties of laser rather than ordinary light?
- 17- Using sketches, explain the types of CMM structures?
- 18- What are the applications of CMM?
- 19- Explain the basic principle of microscopy.
- 20- Why are the optical squares used for turning the line of sight by 90° from its original path instead of flat mirrors?

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