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Question Paper Code : X86532

M.E./M.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021
Second Semester
Computer Integrated Manufacturing
CM5251 – ADVANCES IN METROLOGY AND INSPECTION
(Common to M.E. Manufacturing Engineering)
(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Difference between precision and accuracy.

2. What are the uses of measurement ?

3. Define the term Roughness.

4. What is a R_a and R_z value ?

5. Write the advantage of using laser beam interferometry.

6. What is the purpose of retro-reflectors in LASER interferometers ?

7. Mention the advantages of computer aided inspection.

8. What is laser micrometer ?

9. Define image segmentation.

10. How computer are used in image processing ?

PART – B   (5×13=65 Marks)

11. a) What are the various possible sources of errors in measurements ? Explain
       in detail.

                                (OR)

    b) Define and write a short note on a) Interchangeability b) Selective assembly.

12. a) Explain non contact type roughness measuring device with neat sketch.

(OR)

b) How 3D object surface roughness are measured ? Brief with a suitable example.

13. a) Sketch and describe the optical system of a laser interferometer.

(OR)

b) Explain in detail the various methods of testing accuracy of horizontal milling machine and lathe using LASER Interferometer.

14. a) Explain the calibration of three co-ordinate measuring machine with sketch and state the advantages of CMM.

(OR)

b) Describe in detail of the function and application of machine vision system.

15. a) With a suitable example explain the stages in image processing techniques and methods.

(OR)

b) Write a case study about computer image system on Casting Manufacturing industry and how to reduce errors in it ?

PART – C   (1×15=15 Marks)

16. a) In the measurement of surface roughness, heights of 20 successive peaks and valleys measured from a datum are as follows :
45, 25, 35, 40, 25, 16, 40, 22 25, 34, 25, 40, 20, 36, 28, 18, 20, 25, 30, 38.
If the measurements were made over a length of 20 mm, determine the CLA and RMS values of the surface.

(OR)

b) Explain the principle and working of Taylor Hobsan Talysurf with block diagram.

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