Register Number: …….

B.E DEGREE EXAMINATIONS: NOV / DEC 2010

Fifth Semester

MECHATRONICS ENGINEERING

U07MH505: Dimensional Metrology

Time: Three Hours **Maximum Marks: 100**

Answer All the Questions:-

PART A (1 x 10 = 10 Marks)

1. _____ is the Stylus probe Instruments used for surface finish

   a) Sigma Microtest b) Micro Interferometer

   c) Wallace surface Dynomometer d) none of these

2. Least count for Vernier caliper is

   a) 0.005 b) 0.01 c) 0.02 d) 0.002

3. Sliding fit is coming under

   a) Clearance fit b) Transition fit c) Interference fit d) loose fit

4. The concept Beam splitter is used in

   a) Profile projector b) Laser Interferometer c) CMM d) UMM

5. Which of the following method is used to determine average roughness?

   a) C.L.A method b) R.M.S method c) Ten point height method d) All the above

6. Which of the following surface inspection method is least reliable?

   a) Touch inspection b) Microscopic inspection c) Visual inspection d) Both a and c

7. couplant used in ultrasonic test is _____

   a) oil b) Glycerine c) Water d) Both a & b

8. In magnaflow method, fluroscent ferromagnetic powders are applied by

   a) Dry method b) Wet method c) Penetration method d) none of these

9. Soft keys are used in

   a) CMM b) Universal measuring machine c) Boring machine d) drilling machine

10._____ optical comparator involves double reflection

   a) Zeis ultra comparator b) Zies optotest comparator c) Dial gauge comparator d) LVDT

PART B (10 x 2 = 20 Marks)

11. State two types of tolerances?

12. What are the various types of linear measuring instruments?

13. List out any four angular measuring instrument used in metrology

14. What are the types of comparator?
15. What are the types of fits?
16. Write the types of coordinate measuring machines?
17. What are the methods used for measuring surface roughness?
18. What are the methods used for evaluating the surface finish?
19. What is wringing?
20. What is the principle of ultrasonic test?

PART C (5 x 14 = 70 Marks)

21. a) Control Charts for X and R are maintained for control of an important dimension of a component. The sub group size is settled as 5. The value of X and R are computed for each sub group and the values of $\sum X$ and $\sum R$ are computed for each sub group and the value of $\sum X$ and $\sum R$ after 25 sub groups are found, to be 614.8 and 120.0 respectively. Compute the values of 3 Sigma limits for the X chart and Assume $R = 2.326\sigma'$ (7+7)

(OR)

b) Explain the type of tolerances & classification of fits with example and sketch.

22. a) Explain the method of direct instrument method in surface evaluation?

(OR)

b) What is surface evaluation? Explain the method of inspection by comparison.

23. a) Explain about the machine vision systems.

(OR)

b) Explain the principle and working of autocollimator?

24. a) What is coordinate measuring machine and explain its types & application in detail

(OR)

b) Explain the principle and working of laser interferometer?

25. a) Explain any two types of Non destructive type testing in detail

(OR)

b) What is a sine bar? Explain the principle and working of sine bar with neat sketch.

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