METROLOGY AND NON DESTRUCTIVE TESTING (3 – 1 – 0 : 4)

1. **MEASURING MACHINES** **9**

Tool Maker's microscope - Co-ordinate measuring machines - Universal measuring machine - Laser viewers for production profile checks - Image shearing microscope - Use of computers - Machine vision technology - Microprocessors in metrology.

2. STATISTICAL QUALITY CONTROL **9**

Data presentation - Statistical measures and tools - Process capability - Confidence and tolerence limits - Control charts for variables and for fraction defectives - Theory of probability - Sampling - ABC standard - Realibility and life testing.

3. LIQUID PENETRANT AND MAGNETIC PARTICLE TESTS **9**

Characteristics of liquid penetrants - different washable systems - Developers - applications - Methods of production of magnetic fields - Principles of operation of magnetic particle test - Applications - Advantages and limitations.

4. RADIOGRAPHY **9**

Sources of ray-x-ray production - properties of d and x rays - film characteristics - exposure charts - contrasts - operational characteristics of x ray equipment - applications.

5. ULTRASONIC AND ACOUSTIC EMISSION TECHNIQUES **9**

Production of ultrasonic waves - different types of waves - general characteristics of waves - pulse echo method - A, B, C scans - Principles of acoustic emission techniques - Advantages and limitations - Instrumentation - applications.

Total No of periods: 45

References:

1. JAIN, R.K. " Engineering Metrology ", Khanna Publishers, 1997.

2. Barry Hull and Vernon John, " Non Destructive Testing ", MacMillan, 1988.

3. American Society for Metals, " Metals Hand Book ", Vol.II, 1976.

4. Progress in Acoustic Emission, " Proceedings of 10th International Acoustic Emission Symposium ", Japanese Society for NDI, 1990.

Web References:

1. www.metrologytooling.com

2. www.sisndt.com

3. www.iuk'tu-harburg.de