



VII SEMESTER B. TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, NOVEMBER 2018

SUBJECT: NON DESTRUCTIVE TESTING [PE-V] [MME 4024]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Draw neat and proportionate sketches where ever necessary

- 1A. What are the advantages of NDT over destructive type of tests 2
- 1B. Mention the different forms of developers used in liquid penetrate testing and also list their advantages and disadvantages 3
- 1C. List six important characteristics of good penetrant 3
- 1D. Briefly explain the functions of developer in liquid penetrate testing 2

- 2A. Briefly explain with a sketch the magnetic field orientation and flaw detectability in magnetic particle testing (MPT) 3
- 2B. Explain wet method and dry method of magnetic particle inspection, How particles size effects on test results? 3
- 2C. Define the terms (i) Fill factor, (ii) Skin effect, (iii) Lift of factor and (iv) Edge effect. 4

- 3A. Briefly explain with a sketch the geometric un-sharpness in radiography and various factors controlling it. 3
- 3B. Write a note on application of image quality indicators in radiography 3
- 3C. Find the geometrical un-sharpness to test 100 mm material by an X-ray inspection system with the following settings: source size 30 micron, distance from source to bottom surface of the material is 1000 mm, distance between top surface of material to detector 170 mm. 2
- 3D. A Copper - Titanium bonded plate of total thickness 4 cm consists of copper bonding to titanium. An X-ray beam at approximately 100 Kv is reduced in intensity by 99% on

traversing the plate. What are the thickness of copper and titanium present? Take μ for Copper 4.077 and 1.244 for Titanium.

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- 4A. Mention the advantages and disadvantages of Ultrasonic testing 4
- 4B. With neat diagram briefly explain angle beam and direct beam methods of ultrasonic testing 4
- 4C. Briefly explain how the acoustic emission testing is different to other nondestructive testing (NDT) techniques? 2
- 5A. Write short notes on
 - I. Electromagnetic acoustic transducers
 - II. Couplants 2
- 5B. Explain with a schematic diagram of acoustic emission testing system 3
- 5C. Discuss the general factors to be considered while selecting NDT 3
- 5D. Explain any two types of thermal detectors 2