Printed Pages: 02 **Sub Code: EME062**

Paper Id: **140225** **Roll No.** | | | | | | | | | | |

B TECH
(SEM VIII) THEORY EXAMINATION 2018-19
NON-DESTRUCTIVE TESTING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

a. State various properties of Liquid penetrants.
b. Explain Oil whitening Test.
c. What are the limitations of visual inspection?
d. What are various forging defects?
e. Differentiate between destructive and nondestructive testing with suitable examples.
f. Explain Photoelectric and Compton Effect.
g. Explain Angle beam technique.
h. What are the different sources of X-rays?
i. Write a short note on multi frequency eddy current testing.
j. What are the advantages and limitations of liquid penetrant inspection?

SECTION B

2. Attempt any *three* of the following: **10x3=30**

a. How risk assessment of radiation is made? Enlist some general practices followed against radiation protection and biological effects of radiation.
b. Discuss the *NDT* methods used for inspection of fatigue cracks in machine parts. How these inspections can be carried out?
c. Cleaning of work surface after penetrant application is very crucial; justify. Also describe the key features of Zyglo method.
d. Explain how acoustic impedance of material affects ultrasonic inspection. With the help of neat sketch explain the working of a piezoelectric transducer.
e. Explain the working principle and steps involved in liquid penetrant test for detecting surface defect on the heat-treated object.

SECTION C

3. Attempt any *one* part of the following: **10x1=10**

a. Discuss any three common NDT method used since ages.
b. Explain any six defects inspected by non-destructive testing methods.

4. Attempt any *one* part of the following: **10x1=10**

a. What do you mean developers and what are its types? What are the standards applicable to liquid penetrant testing?
b. Discuss in brief about skin effect. List out the steps involved in magnetic particle inspection using dry magnetic powder.

5. Attempt any *one* part of the following: 10x1=10

a. Discuss the radiation hazards association with radiological inspection and various preventive measures taken to prevent exposure.

b. What are the advantages of gamma ray radiography over x ray radiography?

6. Attempt any *one* part of the following: 10x1=10

a. Explain the different kind of sound waves used in ultrasonic inspection. With a neat sketch explain the working of a piezoelectric transducer also Explain the A-scan and B-scan representation of ultrasonic inspection data.

b. How ultrasonic testing can help in medical diagnosis and inspecting welded joints?

7. Attempt any *one* part of the following: 10x1=10

a. Select a suitable *NDT* method for inspection of following defects an d give reasons for your selection.

(*i*) Porosity in a material

(*ii*) Quench cracks in a weld

b. Describe the inspection of rails by eddy current testing.