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B TECH
(SEM VIII) THEORY EXAMINATION 2017-18
NON DESTRUCTIVE TESTING

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

Note: **1.** Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

a) Define NDT.

b) What do you mean by defects?

c) Enlist various fields of application for Non-Destructive Testing.

d) Enlist the various equipment involved in visual inspection.

e) Define Dwell time.

f) What do you mean by Nature of radiation?

g) Mention recommendations in film handling.

h) Which type of probe is used for restricted spaces and why?

i) Define Eddy current.

j) What is optical inspection?

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a) What is Machine Vision? Discuss in brief about the Human Eye.

b) What is Radiography? Discuss in brief about X-ray Radiography and Y-ray Radiography with suitable applications of both.

c) What do you mean by Destructive testing method? Explain any one in brief. Differentiate it with NDT.

d) Derive Bragg's equation for detecting interplanar spacing and interatomic spacing of material by reflection of X-Ray to the crystal plane.

e) Discuss Zyglo Fluorescent Penetrant Test, also discuss steps involved, Application, Advantages limitations.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a) With the help of a case study state the process of ultrasonic testing techniques. Also discuss the advantages, disadvantages, limitation and application of ultrasonic testing.

b) Explain in brief:

i. Ringing test and chalk test.

ii. Magnetic particle testing.

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4. Attempt any *one* part of the following: 10 x 1 = 10

a) Differentiate between A scan B scan and C scan representation of ultrasonic inspection data.

b) Discuss the working principle of EMAT. What are its advantages over traditional transducers?

5. Attempt any *one* part of the following: 10 x 1 = 10

a) Calculate the Bragg's angle, if X-ray of wavelength 1.542Å deflected by plane (121) and interatomic spacing is 2.43Å. Assume first order reflection.

b) Discuss various types of probes used in ultrasonic testing. Explain the various factors affecting pulse generated from ultrasonic probe. Also discuss the importance of couplant.

6. Attempt any *one* part of the following: 10 x 1 = 10

a) With neat sketch explain the principle and working of eddy current inspection. Write five application of eddy current inspection

b) Discuss in brief

i. Photoelectric effect.

ii. Sources of radiation in radiographic testing.

iii. Scattering factor.

7. Attempt any *one* part of the following: 10 x 1 = 10

a) Explain the basic processing steps of a liquid penetrant inspection? What are the properties the penetrants must have in order to work well?

b) Explain in brief about the rail inspection by eddy current testing method. Discuss the types of probes used in eddy current testing method.

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