Central Institute of technology Kokrajhar

(Deemed to be University)

B. Tech. End-Semester Examination 2025

Non Destructive Testing (UIE813)

Time: 3 Hr. Full Marks: 100

Symbols have their usual significance

*Answer **any five** questions.*

1 a) Explain the working principles for Ultrasonic testing. Mention its advantages and limitations. 8+6

b) Explain, how ultrasonic testing method can be used to measure the thickness of a material? 6

2 a) Explain the working principles for magnetic flux leakage testing. Mention its merits and demerits. 8+6

b) Explain the working principles of magnetic flux leakage testing (MFLT)? 6

3 Explain the six stages of working principles for liquid penetrant testing (LPT). Mention its merits and demerits. Where this LPT can be used? 8+6+6

4 (a) Calculate the beam spread when using a 2.75 MHz, 0.475inch diameter transducer to inspect a component made of brass. The sound velocity in brass is 0.1675×10^6 inch/second. 8

(b) For the Fig.4b), calculate the two distances (x_1 and x_2) in this ultrasonic level measurement application given echo times of 6.25 ns and 85.8 ns, respectively. Also determine the echo times when two distances are 4.56 m and 7.89 m, respectively. Assume that the velocity of light in free space is 3×10^8 m/s. 12

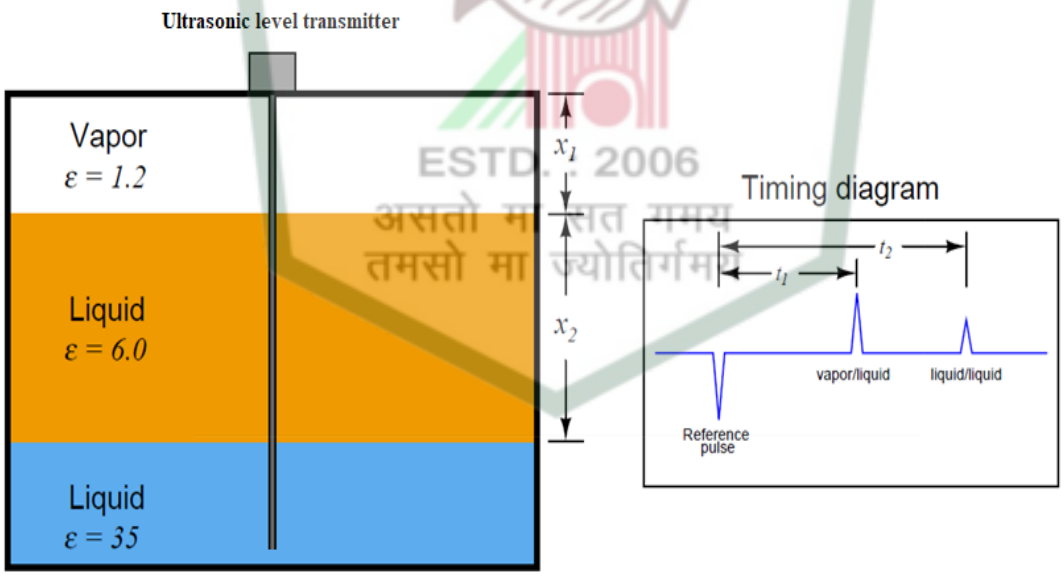

Fig. 4b)

5 a) What do you mean by non-destructing testing (NDT)? Give four examples. 4

b) What are the different types of testing techniques? Mention the application areas for each

technique. 6

c) Why it is important for industries? What are the application areas of NDT? 5

d) Mention the advantages and disadvantages of NDT? 5

6 a) Explain the working principles for eddy current testing. Mention its advantages and limitations. 8+6

b) Explain, briefly, how grounded wave testing works with a schematic diagram. 6

7 Write a short note on the following (any two): 2x10 =20

a) Thermal testing

b) Microwave testing

c) Radiographic testing