Register Number:……..

KUMARAGURU
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**B.E DEGREE EXAMINATIONS: APRIL / MAY 2023**

(Regulation 2018)

Seventh Semester

**AERONAUTICAL ENGINEERING**

U18AEE0012: Non Destructive Testing

**COURSE OUTCOMES**

**CO1:** Identify various methods of Non-destructive testing (NDT) to test the material integrity used in engineering application.
**CO2:** Apply different NDT processes in aerospace industry
**CO3:** Utilize Thermal inspection, Optical holography NDT methods for aerospace applications
**CO4:** Distinguish various defect types and select the appropriate NDT methods for better evaluation

**Time: Three Hours** **Maximum Marks: 100**

**Answer all the Questions:-**
**PART A (10 x 2 = 20 Marks)**
**(Answer not more than 40 words)**

| | | | |
|---|---|---|---|
| 1. | State the importance of NDT in quality assurance | CO1 | [$K_3$] |
| 2. | List out the advantages of composite materials. | CO1 | [$K_3$] |
| 3. | What are the defects in welding? | CO2 | [$K_3$] |
| 4. | Define radioactive decay. | CO2 | [$K_2$] |
| 5. | List out the advantages of ultrasonic testing. | CO2 | [$K_2$] |
| 6. | Mention the different modes of ultrasonic wave propagation | CO3 | [$K_2$] |
| 7. | What is meant by penetrant dwell time? | CO3 | [$K_2$] |
| 8. | Give the limitations of Magnetic particle inspection | CO4 | [$K_2$] |
| 9. | Define thermography. | CO4 | [$K_2$] |
| 10. | Define Holography | CO4 | [$K_2$] |

**Answer any FIVE Questions:-**
**PART B (5 x 16 = 80 Marks)**
**(Answer not more than 400 words)**

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) | State the uses and advantages of Non-Destructive Testing procedures | 8 | CO1 | [$K_3$] |
| | b) | Briefly discuss visual inspection techniques and coin tapping technique for composite structures and adhesive bonds | 8 | CO1 | [$K_3$] |
| 12. | a) | With a neat sketch, explain the process of X- ray production technique. | 8 | CO2 | [$K_3$] |
| | b) | Explain crack detection in a material using gamma ray radiography. List the advantages of radiographic inspection | 8 | CO2 | [$K_3$] |
| 13. | | Describe the different types of scan used in ultrasonic testing. Discuss the factors affecting ultrasonic inspection. | 16 | CO3 | [$K_4$] |
| 14. | | Explain the step by step process involved in liquid penetrant inspection with neat sketch | 16 | CO3 | [$K_4$] |
| 15. | | Define Electromagnetism. With a neat sketch, explain the working principle of eddy current testing. Discuss the factors affecting eddy currents. | 16 | CO3 | [$K_3$] |
| 16. | | Define acoustics. Describe the working of acoustic emission technique with a neat sketch. Discuss the sources of acoustic emission in composites. | 16 | CO4 | [$K_4$] |

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