Register Number:……..

KUMARAGURU college of technology
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**B.E DEGREE EXAMINATIONS: APRIL /MAY 2024**

(Regulation 2018)

Fourth Semester

**AERONAUTICAL ENGINEERING**

U18AET4005: Aircraft Hardware and Materials

**COURSE OUTCOMES**

CO1: Analyze the properties of different aircraft materials.

CO2: Identify the various types of composite and non-metallic materials for aircraft construction.

CO3: Apply suitable hardware materials for different parts of the aircraft.

CO4: Identify the appropriate cables and connectors for various aircraft applications.

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

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

| | | | |
|---|---|---|---|
| 1. | Write about the steel numbering system in an aviation industry. | CO1 | [$K_2$] |
| 2. | Mention the plating methods used for corrosion protection. | CO1 | [$K_1$] |
| 3. | What are the advantages of using composite materials for aircraft construction? | CO2 | [$K_2$] |
| 4. | Brief the purposes of the fabric covering on an aircraft. | CO2 | [$K_2$] |
| 5. | Differentiate between Bolts and Screws | CO3 | [$K_2$] |
| 6. | List out the types of Fasteners in aerospace industry. | CO3 | [$K_1$] |
| 7. | How to crimp electrical connector? | CO4 | [$K_2$] |
| 8. | Where are the turnbuckles used in an aircraft? | CO4 | [$K_2$] |
| 9. | Define gear ratio. | CO4 | [$K_1$] |
| 10. | What is the significance of using spring in aircraft? | CO4 | [$K_2$] |

**Answer any FIVE Questions:-**

**PART B (5 x 16 = 80 Marks)**

**(Answer not more than 400 words)**

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) | Illustrate the heat treatment of steel. | 8 | CO1 | [$K_2$] |
| | b) | Explain the types of testing in aircraft materials. | 8 | CO1 | [$K_2$] |

| | | | | | |
|---|---|---|---|---|---|
| 12. | a) | Give details on the seasoning of wood and its types. | 8 | CO2 | [$K_2$] |
| | b) | Brief the doping procedure on the aircraft. What are the non-metallic materials used in aircraft? | 8 | CO2 | [$K_2$] |
| 13. | a) | Elaborate the bolt part number AN3DD5A | 4 | CO3 | [$K_2$] |
| | b) | Describe the types of special purpose bolts used in aircraft. | 12 | CO3 | [$K_2$] |
| 14. | a) | How do the different non-self-locking nuts differ in design and function? | 8 | CO3 | [$K_2$] |
| | b) | Compare the types of bearings used in aircraft. | 8 | CO3 | [$K_2$] |
| 15. | a) | Compare the operations of various cables used in an aircraft. | 10 | CO4 | [$K_2$] |
| | b) | Demonstrate the factors affecting the selection of the materials in the electrical wire/cable. | 6 | CO4 | [$K_2$] |
| 16. | a) | Mention the types of gears and springs used in aircraft applications. | 10 | CO3 | [$K_2$] |
| | b) | Summarize the mechanical features of aircraft electrical connectors. | 6 | CO4 | [$K_2$] |

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