KUMARAGURU
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Register Number: …….

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2013)

Fourth Semester

AERONAUTICAL ENGINEERING

U13AET405: Aircraft Materials and Processes

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

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Propeller hub of an aircraft made of _____ steel.
   a) Chrome-Vanadium b) Chrome-Nickel
   c) Chrome-Molybdenum d) Nickel-Cadmium
2. The property of metal being liquefied by heat is _____.
3. _____ is called as K Monel.
   a) Nickel-copper b) Chrome-Nickel
   c) Nickel-Copper-Aluminium d) Nickel-Cadmium-Copper
4. _____ Alloys are non- sparking and non magnetic.
5. Temperature at which a normal conductor loses its resistivity and becomes a superconductor is called as_____
   a) Absolute temperature b) Stagnation point
   c) Freezing point. d) Transition Temperature
6. _____ are used in re-entry rockets and space vehicles to isolate and protect them from hyperthermal effects of the environment.
7. The mixture of pigment and varnish is called as_____.
   a) Lacquer b) Enamel
   c) Paralketone d) Marine Glue
8. _____ method used for artificial seasoning of an aircraft wood.
9. _____ is the process of heating the parts in the zinc oxide atmosphere.
   a) Sherardizing b) Parkerizing
   c) Coslettizing d) Bonderizing
10. The stress level below which, the material does not fail for any number of cyclic loading is called as_____.

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. What are smart materials?
12. Define gage length.
13. Name the surface treatment process used for aluminium alloys.
14. List any four properties of super alloys.
15. What is super conductivity?
16. What is ablation?
17. Define composite.
18. What is doping? Why it is required?
19. Define creep.
20. What is called stress corrosion?

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. Describe the ablation process with neat sketch. List the properties and applications of ablative materials.

22. a) Explain the Engineering and economic consideration for selecting materials for aircraft use.

(OR)

b) Explain the following:

(i) Radigraphy. (5)

(ii) Impact Test. (5)

(iii) Hydrostatic Test. (4)

23. a) List the properties of the following alloys.

(i) Aluminium alloy. (7)

(ii) Titanium Alloy. (7)

(OR)

b) Explain the heat treatment and surface treatment process of super alloys.

24. a) (i) Describe the factors affecting the strength of an aircraft wood. (7)

(ii) Explain the properties, application and advantages of Cellulose-Nitrate dope. (7)

(OR)

b) Describe the properties and application of the following paints

(i) Acid resistant paint (4)

(ii) Bituminous paint (5)

(iii) Varnish (5)

25. a) Explain any three plating process used to prevent the corrosion with neat sketch.

(OR)

b) Describe the mechanism of the following:

(i) Fatigue. (7)

(ii) Creep. (7)

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