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10AE662

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Aircraft Materials

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO full questions from each part.**

PART – A

- 1 a. Explain the requirement of aircraft materials and factors to be considered in the selection of materials for airframes. (10 Marks)
- b. With a neat graphical representation, explain the applications and trends in usage of materials in aero engines. (10 Marks)
- 2 a. Explain the different types of heat treatment carried out on super alloys. (10 Marks)
- b. Briefly explain any five low alloy steels. (10 Marks)
- 3 a. What are composites? Differentiate composite with that of alloys and mention the properties of composites. (10 Marks)
- b. Explain the following:
 - i) Natural of hybrid composites
 - ii) Metal-matrix composites
 - iii) Carbon-carbon composites
 - iv) Polymer matrix composites. (10 Marks)
- 4 a. i) Write a note on physical characteristics of commonly used by polymer material.
ii) Give the typical mechanical and physical properties of aircraft quality glass. (10 Marks)
- b. Define adhesives and sealants. Give their application in aircraft. (10 Marks)

PART – B

- 5 a. Give the aerospace application of ablative and super conducting materials. (10 Marks)
- b. Explain the following: i) Ablation process ii) Superconduction. (10 Marks)
- 6 a. Briefly explain about the aircraft painting process, with types of paints and its importance. (10 Marks)
- b. Write notes on the following:
 - i) Joining processes for wood (03 Marks)
 - ii) Terminologies in aircraft fabrics (03 Marks)
 - iii) Common defects in wood (03 Marks)
 - iv) Importance of doping. (01 Marks)
- 7 a. Explain the following corrosion protection process:
 - i) Cleaning operation ii) Plating operation. (10 Marks)
- b. Discuss about the various methods used for removal of corrosion from aircraft metals. (10 Marks)
- 8 a. Name the different types of propellant and gives its general and describe properties. (10 Marks)
- b. Examine the mechanical characterization of solid propellants using uni-axial, strip-biaxial and tubular tests. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.