Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18AE2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **AEROSPACE MATERIALS AND PROCESSES** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10 X 1 = 10 MARKS)** | | | |
| 1. | Define lattice parameter. | CO1 | 1 |
| 2. | Infer the free energy of a solid solution when ΔH > 0. | CO1 | 1 |
| 3. | Define malleability. | CO2 | 1 |
| 4. | Define fusibility. | CO2 | 1 |
| 5. | List the properties of austenitic stainless steel. | CO3 | 1 |
| 6. | State two major properties of tool steel. | CO3 | 1 |
| 7. | Nickel Copper alloys are also called as \_\_\_\_\_\_\_\_\_\_\_\_\_\_. | CO4 | 1 |
| 8. | Define beryllium bronze. | CO4 | 1 |
| 9. | Define magnesium zinc binary alloy system. | CO5 | 1 |
| 10. | Vanadium has the largest influence on beta titanium. (True or False) | CO5 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | |
| 11. | Indicate the conditions for obtaining substitutional solid solubility. | CO1 | 3 |
| 12. | State the elastic and proportional limit. | CO2 | 3 |
| 13. | Outline your knowledge on dead mild steel. | CO3 | 3 |
| 14. | Classify brass. | CO4 | 3 |
| 15. | State the effect of adding yittrium with magnesium. | CO5 | 3 |
| 16. | Classify aluminium alloys. | CO6 | 3 |

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|  | **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | |
| 17. |  | Enumerate the following:  i) Optical Microscope. ii) Electron Microscope. iii) Scanning Electron Microscope. | CO1 | 12 |
| 18. |  | Enumerate the following:  i) Hydrostatic testing ii) Fatigue testing | CO2 | 12 |
| 19. |  | Mention the characteristics of the following with examples.   1. Medium carbon steel. 2. High carbon steel | CO3  CO3 | 4  8 |
| 20. |  | Describe the extraction and refining process of copper. | CO4 | 12 |
| 21. | a. | Describe your knowledge on Magnesium alloy designations. | CO5 | 6 |
| b. | Ennumerate the physical properties and production of titanium. | CO5 | 6 |
| 22. | a. | Discuss about flattening test. | CO2 | 4 |
| b. | Illustrate impact testing techniques. | CO2 | 6 |
| c. | Illustrate a face centred cubic crystal with a neat sketch. | CO1 | 2 |
| 23. |  | List the effect of adding following alloying elements to steel.  i) Nickel and Silicon ii) Titanium and Vanadium iii) Manganese and Tungsten | CO3 | 12 |
|  |  | **Compulsory:** | | |
| 24. |  | Enumerate the defects produced during the following process.  i) Extrusion ii) Heat treatment iii) Forging iv) Casting. | CO6 | 12 |