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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **15AE3008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Unmanned Aircraft Systems** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | The smallest avionics suite, which also incorporates all subsystems functions, weighs 0.02kg, lighting weight 0.09 Kg. The structural mass fraction is 0.2, the battery energy storage mass fraction is 0.2, and the electric motor and propeller mass fraction is 0.1. Except for the payload, all weights are fully accounted for within these parameters. What is the maximum payload capacity of the UAV? | CO2 | 10 |
| b. | Briefly explain the Applications for UAV. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | Briefly explain classifications of UAV. | CO1 | 15 |
| b. | Find the Mean chord, Aspect ratio and taper ration of wing shown in below.  CR = 5 cm  4 cm  CT = 1.5 cm  10 cm |  | 5 |
| 3. | a. | Briefly explain types of Hardware accelerator. | CO1 | 15 |
|  | b. | Explain communication unit in UAV. | CO1 | 5 |
|  | c. | Explain LIDAR. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Drive the turning radius equation with figure for both wind and absence of wind conditions. | CO2 | 10 |
|  | b. | Write down the kinematic equation relating to position and velocity | CO2 | 10 |
| 5. |  | Briefly explain the Payload types of unmanned aircraft system. List out the necessary payload requirement for UAV used for agriculture. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Discuss the different types of Power Sources for Unmanned Aircraft Applications. | CO1 | 20 |
| 7. |  | Design the high altitude mini UAV having 400 grams overall weight, velocity 15 m/s at 4000m altitude. Discuss size, aerofoil section, wing design and tail design. | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Briefly explain roles of UAV in Naval and Army. | CO1 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | Discuss the future prospects and challenges of UAV. | CO1 | 20 |

ALL THE BEST