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 :** | **14AE2027** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NAVIGATION, GUIDANCE & CONTROL** | **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. | Explain the following terms   1. Navigation by pilotage 2. Dead Reckoning 3. ADF & NDB 4. TACAN | 1  1  1  1 | **5**  **5**  **5**  **5** |
| **(OR)** | | | | |
| 2. | a. | Explain in detail basic VFR navigation techniques. | 1 | **10** |
| b. | What are the radio navigation types? Explain in detail. | 1 | **10** |
| 3. | a. | Explain the two different approach guidance systems in detail. | 1 | **20** |
| **(OR)** | | | | |
| 4. | a. | The characteristic polynomial of a system of a system is s7 + 9 s6 + 24 s5 + 24 s4 + 24 s3 + 24 s2 + 23s + 15 = 0. Determine the location of roots on s-plane and hence the stability of the system. | 2 | **10** |
|  | b. | State the Routh Hurwitz criterion and solve s5 + s4 + 2s3 + 2s2 + 3s + 5 = 5. | 2 | **10** |
| 5. | a. | Comment on inertial navigation systems, their sensors and the different co-ordinate frames. | 2 | **20** |
| **(OR)** | | | | |
| 6. | a. | What are autopilot systems? What are the sensors used? Explain longitudinal, lateral and missile autopilot systems. | 2 | **20** |
| 7. | a. | Solve the following with the method root locus and analyse the stability of the system  G(s) = | 2 | **20** |
| **(OR)** | | | | |
| 8. | a. | How does the interception of missiles with its targets work? Explain the methods by which it is guided. | 2 | **20** |
|  | | **Compulsory:** |  |  |
| 9. | a. | What are pitch and yaw orientation control systems. Explain in Detail. | 2 | **20** |

ALL THE BEST