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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| **Code :** | **14AE2022** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ROCKET PROPULSION** | **Max. marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | | **Questions** | | **Course**  **Outcome** | **Marks** |
| 1. |  | With a neat sketch explain the operating principle of a solid propellant  rocket motor. | | | CO1 | 20 |
| (OR) | | | | | | |
| 2. |  | What are the interrelated requirements of the grain for a solid rocket motor? | | | CO2 | 20 |
| 3. | a. | | A rocket projectile has the following characteristics: Initial mass 260 kg  Mass after rocket operation Payload 130 kg  Rocket operating duration 4.0 sec  Average specific impulse of propellant 235 sec  Determine the vehicle's mass ratio, propellant mass fraction, propellant flow rate, thrust, thrust-to-weight ratio, acceleration of vehicle, effective exhaust velocity, total impulse. | | CO1 | 15 |
|  | b. | | The following measurements were made in a sea level test of a solid propellant rocket motor:  Burn duration 45 sec  Initial mass before test 1200 kg  Mass of rocket motor after test 215 kg  Determine the mass flow rate of the engine? | | CO1 | 5 |
| (OR) | | | | | | |
| 4. | a. | | What are altitute compensating nozzle? | | CO2 | 5 |
|  | b. | | Explain the annular nozzle with a neat sketch. | | CO2 | 15 |
| 5. | With a neat sketch explain turbo pump feed system in a liquid rocket engine. | | | | CO2 | 20 |
| (OR) | | | | | | |
| 6. | Write a short note on   1. ramjet intake 2. combustion in ramjet | | | | CO1 | 20 |
| 7. | Explain nuclear rocket engine with the help of a neat sketch. State its advantages and disadvantages. | | | | CO2 | 20 |
| (OR) | | | | | | |
| 8. | a. | | What are Integral ram rocket? | | CO1 | 5 |
|  | b. | | Explain with a neat sketch the differents parts of an intergral ram rocket | | CO1 | 15 |
| **Compulsory:** | | | | | | |
| 9. |  | | | Explain the various safety provisions in a modern test facility. | CO2 | 20 |