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

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**End Semester Examination – Nov/Dec – 2018**

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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. |  | What are the characteristic the propellant should posses for a solid propellant rocket motor? | CO1 | 20 |
| (OR) | | | | |
| 2. | a. | How is regressive, neutral and progressive burning of the solid motor achieved? Explain with the aid of a diagram. | CO2 | 15 |
| b. | State five advantages and disadvantages of solid propellant rocket. | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | How rocket propulsion differs from jet propulsion? | CO1 | 6 |
| b. | What are the types of nozzles used for rocket propulsion? Explain about each one briefly. | CO2 | 14 |
| (OR) | | | | |
| 4. | a. | What are the losses encountered in real nozzle? | CO1 | 10 |
| b. | What are the different types of annular nozzle? | CO1 | 10 |
|  |  |  |  |  |
| 5. | a. | With a neat sketch explain the working principle of turbo-pump feed system in a liquid propellant rocket engine. | CO2 | 15 |
| b. | State the advantage and disadvantage of liquid propellant engines. | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | Draw the thermodynamic cycle of ram jet engine. | CO1 | 4 |
| b. | Explain in detail the working principle of ramjet engine with neat sketches. | CO2 | 16 |
|  |  |  |  |  |
| 7. | a. | Draw the schematic diagram of hybrid rocket. | CO1 | 5 |
| b. | Explain the working principle of hybrid rocket. | CO2 | 10 |
| c. | List out the limitations of hybrid rocket. | CO1 | 5 |
| (OR) | | | | |
| 8. |  | Explain in detail the safety precaution taken before testing a static rocket motor? | CO2 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Write short note on  a. Additives. b. Particle size parameter. c. Organic oxidizers. | CO2 | 5+5+10 |