



- 7 a. For a given mass ratio ' $\mu$ ' and specific Impulse ' $I$ ', how does the burnout velocity of a single – stage rocket vary with the thrust ratio ' $R$ '. Assume vertical flight. Discuss the performance of a single – stage rocket engine, by deriving some expression. (12 Marks)
- b. Determine the burnout speed of a rocket launched vertically, using a fuel of specific impulse 250 sec and a mass fraction of 0.22 with  $R = 3$ . (08 Marks)
- 8 a. Briefly explain Life support system for manned mission. (10 Marks)
- b. What are the generalized requirements of materials for spacecraft? (05 Marks)
- c. How materials for space craft can be selected? (05 Marks)

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