Code No: R05322103 **R05** **Set No. 2**

III B.Tech II Semester Examinations,December 2010
AEROSPACE PROPULSION-II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Suppose you are planning to launch a pay load on a long journey to a planet, what type of light weight propulsion system would you suggest for the payload for its course correction? Explain the propulsion system. [16]
2. List one or more solid propellant combinations that would be suitable for the following:
   (a) Large booster for space vehicle
   (b) Infantry shoulderlaunched anti-tank projectile. [8+8]
3. Explain the distinct features, advantages and disadvantages of the following with respect to a solid rocket motor:
   (a) Jetvanes
   (b) Mechanical Probes
   (c) Hot gas injection
   (d) Moveable nozzle (flexible bearing) [4+4+4+4]
4. Explain the preliminary concepts in supersonic combustion. [16]
5. With a neat sketch show the nozzle geometric parameters and explain the following:
   (a) Thrust coefficient
   (b) Discharge coefficient [8+8]
6. Write detailed notes on the various losses incurred by the chosen cooling process and their effect on the turbine cycle efficiency. [16]
7. (a) For a free vortex turbine blade with an impulse hub show that the degree of reaction ($\wedge$) at any radius 'r' is related to the hub radius 'r_h' by the following relation:
   $\Lambda = 1 - (r - h / r)^2$
   (b) For such a turbine determine the degree of reaction at the mean and tip diameters when the root and tip diameters are 50 and 100cms respectively. [10+6]
8. Explain the propellant feed systems used in liquid propulsion rockets and compare them. [16]

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Code No: R05322103 **R05** **Set No. 4**

III B.Tech II Semester Examinations,December 2010
AEROSPACE PROPULSION-II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. With a neat sketch show the nozzle geometric parameters and explain the following:
   (a) Thrust coefficient
   (b) Discharge coefficient [8+8]
2. List one or more solid propellant combinations that would be suitable for the following:
   (a) Large booster for space vehicle
   (b) Infantry shoulderlaunched anti-tank projectile. [8+8]
3. (a) For a free vortex turbine blade with an impulse hub show that the degree of reaction ($\wedge$) at any radius 'r' is related to the hub radius 'r_h' by the following relation:
   $\Lambda = 1 - (r - h / r)^2$
   (b) For such a turbine determine the degree of reaction at the mean and tip diameters when the root and tip diameters are 50 and 100cms respectively. [10+6]
4. Write detailed notes on the various losses incurred by the chosen cooling process and their effect on the turbine cycle efficiency. [16]
5. Explain the distinct features, advantages and disadvantages of the following with respect to a solid rocket motor:
   (a) Jetvanes
   (b) Mechanical Probes
   (c) Hot gas injection
   (d) Moveable nozzle (flexible bearing) [4+4+4+4]
6. Explain the propellant feed systems used in liquid propulsion rockets and compare them. [16]
7. Suppose you are planning to launch a pay load on a long journey to a planet, what type of light weight propulsion system would you suggest for the payload for its course correction? Explain the propulsion system. [16]
8. Explain the preliminary concepts in supersonic combustion. [16]

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Code No: R05322103 **R05** **Set No. 1**

III B.Tech II Semester Examinations,December 2010
AEROSPACE PROPULSION-II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. List one or more solid propellant combinations that would be suitable for the following:
   (a) Large booster for space vehicle
   (b) Infantry shoulderlaunched anti-tank projectile. [8+8]
2. (a) For a free vortex turbine blade with an impulse hub show that the degree of reaction ($\wedge$) at any radius 'r' is related to the hub radius 'r_h' by the following relation:
   $\Lambda = 1 - (r - h / r)^2$
   (b) For such a turbine determine the degree of reaction at the mean and tip diameters when the root and tip diameters are 50 and 100cms respectively. [10+6]
3. Write detailed notes on the various losses incurred by the chosen cooling process and their effect on the turbine cycle efficiency. [16]
4. With a neat sketch show the nozzle geometric parameters and explain the following:
   (a) Thrust coefficient
   (b) Discharge coefficient [8+8]
5. Explain the distinct features, advantages and disadvantages of the following with respect to a solid rocket motor:
   (a) Jetvanes
   (b) Mechanical Probes
   (c) Hot gas injection
   (d) Moveable nozzle (flexible bearing) [4+4+4+4]
6. Explain the propellant feed systems used in liquid propulsion rockets and compare them. [16]
7. Explain the preliminary concepts in supersonic combustion. [16]
8. Suppose you are planning to launch a pay load on a long journey to a planet, what type of light weight propulsion system would you suggest for the payload for its course correction? Explain the propulsion system. [16]

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Code No: R05322103 **R05** **Set No. 3**

III B.Tech II Semester Examinations,December 2010
AEROSPACE PROPULSION-II
Aeronautical Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Suppose you are planning to launch a pay load on a long journey to a planet, what type of light weight propulsion system would you suggest for the payload for its course correction? Explain the propulsion system. [16]
2. Write detailed notes on the various losses incurred by the chosen cooling process and their effect on the turbine cycle efficiency. [16]
3. With a neat sketch show the nozzle geometric parameters and explain the following:
   (a) Thrust coefficient
   (b) Discharge coefficient [8+8]
4. Explain the propellant feed systems used in liquid propulsion rockets and compare them. [16]
5. (a) For a free vortex turbine blade with an impulse hub show that the degree of reaction ($\wedge$) at any radius 'r' is related to the hub radius 'r_h' by the following relation:
   Λ = 1- ($r-h$ / r)^2
   (b) For such a turbine determine the degree of reaction at the mean and tip diameters when the root and tip diameters are 50 and 100cms respectively. [10+6]
6. Explain the distinct features, advantages and disadvantages of the following with respect to a solid rocket motor:
   (a) Jetvanes
   (b) Mechanical Probes
   (c) Hot gas injection
   (d) Moveable nozzle (flexible bearing) [4+4+4+4]
7. List one or more solid propellant combinations that would be suitable for the following:
   (a) Large booster for space vehicle
   (b) Infantry shoulderlaunched anti-tank projectile. [8+8]
8. Explain the preliminary concepts in supersonic combustion. [16]

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