Code No: 07A52104 **R07** **Set No. 2**

III B.Tech I Semester Examinations,December 2011
AEROSPACE PROPULSION-I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. What is meant by low degree of reaction and high degree of reaction? How do you differentiate these two? [16]

2. Explain about the limitations of the following in gas turbine combustors with their relative importance

   (a) Pressure.
   (b) Temperature.
   (c) Inlet air velocities.
   (d) Flame speeds.
   (e) Light gauge heat resistant sheets.

   [16]

3. (a) Enumerate four fundamental laws frequently used in dealing with problems and operation of rotary components like gas turbines.
   (b) Explain important thermodynamic properties used in the understanding of gas turbines. [8+8]

4. Discuss briefly the contingencies experienced due to ignition process inside combustors. [16]

5. (a) A centrifugal air compressor delivers 20 kg/s of air with a total head pressure ratio of 4:1. The speed of compressor is 12000 rpm. Inlet total temperature is 15^0C, slip factor 0.9, power inlet factor 1.04, and the total head isentropic efficiency as 80%. Calculate overall diameter of the impeller.
   (b) Briefly explain how a centrifugal compressor diffuser is designed. [8+8]

6. Explain the concept of thrust reversing using clamshell reverse type of arrangement with neat sketch. [16]

7. What are subsonic inlets? Explain the significance of nacelle in subsonic inlets. [16]

8. Derive normal shock wave relations for a calorifically perfect gas. [16]

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Code No: 07A52104 **R07** **Set No. 4**

III B.Tech I Semester Examinations,December 2011
AEROSPACE PROPULSION-I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain about the limitations of the following in gas turbine combustors with their relative importance
   (a) Pressure.
   (b) Temperature.
   (c) Inlet air velocities.
   (d) Flame speeds.
   (e) Light gauge heat resistant sheets.
   [16]
2. What is meant by low degree of reaction and high degree of reaction? How do you differentiate these two? [16]
3. Derive normal shock wave relations for a calorifically perfect gas. [16]
4. Explain the concept of thrust reversing using clamshell reverse type of arrangement with neat sketch.
   [16]
5. What are subsonic inlets? Explain the significance of nacelle in subsonic inlets.
   [16]
6. (a) Enumerate four fundamental laws frequently used in dealing with problems and operation of rotary components like gas turbines.
   (b) Explain important thermodynamic properties used in the understanding of gas turbines. [8+8]
7. (a) A centrifugal air compressor delivers 20 kg/s of air with a total head pressure ratio of 4:1. The speed of compressor is 12000 rpm. Inlet total temperature is 15^0C, slip factor 0.9, power inlet factor 1.04, and the total head isentropic efficiency as 80%. Calculate overall diameter of the impeller.
   (b) Briefly explain how a centrifugal compressor diffuser is designed. [8+8]
8. Discuss briefly the contingencies experienced due to ignition process inside combustors. [16]

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Code No: 07A52104 **R07** **Set No. 1**

III B.Tech I Semester Examinations,December 2011
AEROSPACE PROPULSION-I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain about the limitations of the following in gas turbine combustors with their relative importance
   (a) Pressure.
   (b) Temperature.
   (c) Inlet air velocities.
   (d) Flame speeds.
   (e) Light gauge heat resistant sheets.
   [16]
2. What is meant by low degree of reaction and high degree of reaction? How do you differentiate these two? [16]
3. What are subsonic inlets? Explain the significance of nacelle in subsonic inlets. [16]
4. (a) A centrifugal air compressor delivers 20 kg/s of air with a total head pressure ratio of 4:1. The speed of compressor is 12000 rpm. Inlet total temperature is 15^0C, slip factor 0.9, power inlet factor 1.04, and the total head isentropic efficiency as 80%. Calculate overall diameter of the impeller.
   (b) Briefly explain how a centrifugal compressor diffuser is designed. [8+8]
5. Explain the concept of thrust reversing using clamshell reverse type of arrangement with neat sketch. [16]
6. Derive normal shock wave relations for a calorifically perfect gas. [16]
7. (a) Enumerate four fundamental laws frequently used in dealing with problems and operation of rotary components like gas turbines.
   (b) Explain important thermodynamic properties used in the understanding of gas turbines. [8+8]
8. Discuss briefly the contingencies experienced due to ignition process inside combustors. [16]

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Code No: 07A52104 **R07** **Set No. 3**

III B.Tech I Semester Examinations,December 2011
AEROSPACE PROPULSION-I
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the concept of thrust reversing using clamshell reverse type of arrangement with neat sketch. [16]

2. (a) A centrifugal air compressor delivers 20 kg/s of air with a total head pressure ratio of 4:1. The speed of compressor is 12000 rpm. Inlet total temperature is 15^0C, slip factor 0.9, power inlet factor 1.04, and the total head isentropic efficiency as 80%. Calculate overall diameter of the impeller.
   (b) Briefly explain how a centrifugal compressor diffuser is designed. [8+8]

3. Explain about the limitations of the following in gas turbine combustors with their relative importance
   (a) Pressure.
   (b) Temperature.
   (c) Inlet air velocities.
   (d) Flame speeds.
   (e) Light gauge heat resistant sheets. [16]

4. What is meant by low degree of reaction and high degree of reaction? How do you differentiate these two? [16]

5. Discuss briefly the contingencies experienced due to ignition process inside combustors. [16]

6. Derive normal shock wave relations for a calorifically perfect gas. [16]

7. What are subsonic inlets? Explain the significance of nacelle in subsonic inlets. [16]

8. (a) Enumerate four fundamental laws frequently used in dealing with problems and operation of rotary components like gas turbines.
   (b) Explain important thermodynamic properties used in the understanding of gas turbines. [8+8]

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