Code No: RR312106 | RR | SET-1

B. Tech III Year I Semester Examinations, December - 2011
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. Explain the aerodynamics and thermodynamics of an external compression supersonic air inlet. Give one example of supersonic inlet. [16]

2. What are the basic requirements of a fuel injection system? Explain the working of a typical fuel injection system of a turbine engine with the help of a neat sketch. [16]

3.a) Write a note on 'choking of centrifugal compressor'.
b) Distinguish between choked flows and un-choked flows. [8+8]

4. Consider a conical spike type supersonic air inlet with fixed geometry for optimum performance at a particular Mach number. Describe its aerodynamics and thermodynamics at the design Mach number. What happens when the operating Mach number falls short of the design Mach number? [16]

5. Write a short notes on
a) Surging in axial flow compressor.
b) Centrifugal and axial flow compressors.
c) Thrust reversal.
d) Flame stabilization. [16]

6.a) Sketch and explain the velocity triangles for various stages of centrifugal flow compressor.
b) Explain the working of a 4 stroke reciprocating engine using neat sketches.[16]

7. Consider an air standard Brayton cycle, where the air enters the compressor at 0.15 MPa, 25^{o} C. it leaves the compressor at 0.45 MPa. TIT is 1000^{o}C. Determine pressure and temperature at each point in the cycle. Work out the efficiency of its compressor, turbine and overall engine. [16]

8. Explain the working of turbo jet, turbo fan and turbo prop engines using neat sketches. Obtain the thrust equation for a jet engine. [16]

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Code No: RR312106 | RR | SET-2

B. Tech III Year I Semester Examinations, December - 2011
AEROSPACE PROPULSION - II
(AERONAUTICAL ENGINEERING)

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

Answer any five questions
All questions carry equal marks

1.a) Write a note on 'choking of centrifugal compressor'.
b) Distinguish between choked flows and un-choked flows. [8+8]

2. Consider a conical spike type supersonic air inlet with fixed geometry for optimum performance at a particular Mach number. Describe its aerodynamics and thermodynamics at the design Mach number. What happens when the operating Mach number falls short of the design Mach number? [16]

3. Write short notes on
a) Surging in axial flow compressor.
b) Centrifugal and axial flow compressors.
c) Thrust reversal.
d) Flame stabilization. [16]

4.a) Sketch and explain the velocity triangles for various stages of centrifugal flow compressor.
b) Explain the working of a 4 stroke reciprocating engine using neat sketches.[16]

5. Consider an air standard Brayton cycle, where the air enters the compressor at 0.15 MPa, 25^{o} C. it leaves the compressor at 0.45 MPa. TIT is 1000^{o}C. Determine pressure and temperature at each point in the cycle. Work out the efficiency of its compressor, turbine and overall engine. [16]

6. Explain the working of turbo jet, turbo fan and turbo prop engines using neat sketches. Obtain the thrust equation for a jet engine. [16]

7. Explain the aerodynamics and thermodynamics of an external compression supersonic air inlet. Give one example of supersonic inlet. [16]

8. What are the basic requirements of a fuel injection system? Explain the working of a typical fuel injection system of a turbine engine with the help of a neat sketch. [16]

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Code No: RR312106	RR	SET-3

B. Tech III Year I Semester Examinations, December - 2011
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. Write short notes on
   a) Surging in axial flow compressor.
   b) Centrifugal and axial flow compressors.
   c) Thrust reversal.
   d) Flame stabilization. [16]

2.a) Sketch and explain the velocity triangles for various stages of centrifugal flow compressor.
   b) Explain the working of a 4 stroke reciprocating engine using neat sketches.[16]

3. Consider an air standard Brayton cycle, where the air enters the compressor at 0.15 MPa, 25^{o} C. it leaves the compressor at 0.45 MPa. TIT is 1000^{o}C. Determine pressure and temperature at each point in the cycle. Work out the efficiency of its compressor, turbine and overall engine. [16]

4. Explain the working of turbo jet, turbo fan and turbo prop engines using neat sketches. Obtain the thrust equation for a jet engine. [16]

5. Explain the aerodynamics and thermodynamics of an external compression supersonic air inlet. Give one example of supersonic inlet. [16]

6. What are the basic requirements of a fuel injection system? Explain the working of a typical fuel injection system of a turbine engine with the help of a neat sketch. [16]

7.a) Write a note on ‘choking of centrifugal compressor’.
   b) Distinguish between choked flows and un-choked flows. [8+8]

8. Consider a conical spike type supersonic air inlet with fixed geometry for optimum performance at a particular Mach number. Describe its aerodynamics and thermodynamics at the design Mach number. What happens when the operating Mach number falls short of the design Mach number? [16]

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Code No: RR312106	RR	SET-4

B. Tech III Year I Semester Examinations, December - 2011
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. Consider an air standard Brayton cycle, where the air enters the compressor at 0.15 MPa, 25^{o} C. it leaves the compressor at 0.45 MPa. TIT is 1000^{o}C. Determine pressure and temperature at each point in the cycle. Work out the efficiency of its compressor, turbine and overall engine. [16]

2. Explain the working of turbo jet, turbo fan and turbo prop engines using neat sketches. Obtain the thrust equation for a jet engine. [16]

3. Explain the aerodynamics and thermodynamics of an external compression supersonic air inlet. Give one example of supersonic inlet. [16]

4. What are the basic requirements of a fuel injection system? Explain the working of a typical fuel injection system of a turbine engine with the help of a neat sketch. [16]

5.a) Write a note on 'choking of centrifugal compressor'.
b) Distinguish between choked flows and un-choked flows. [8+8]

6. Consider a conical spike type supersonic air inlet with fixed geometry for optimum performance at a particular Mach number. Describe its aerodynamics and thermodynamics at the design Mach number. What happens when the operating Mach number falls short of the design Mach number? [16]

7. Write short notes on
a) Surging in axial flow compressor.
b) Centrifugal and axial flow compressors.
c) Thrust reversal.
d) Flame stabilization. [16]

8.a) Sketch and explain the velocity triangles for various stages of centrifugal flow compressor.
b) Explain the working of a 4 stroke reciprocating engine using neat sketches.[16]

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