Code No: R05412104 **R05** **Set No. 2**

IV B.Tech I Semester Examinations,November 2010
AIRCRAFT MATERIALS AND COMPOSITES
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Briefly classify ceramic matrix composites and give examples.
   (b) Discuss in detail continuous fiber reinforced ceramic matrix composites.[3+13]
2. What are aramid fibres? How are they manufactured. Discuss their properties and applications. [16]
3. (a) List and explain the parameters which affect the fracture toughness of a material.
   (b) Explain the role of different penetrant test methods. What are emulsifiers? Discuss. [6+10]
4. (a) Write the computational procedure for the determination of lamina strength.
   (b) Explain how a composites (FRA) elastic constant is found theorietically, when the fibres are in transverse and in longitudinal direction. [8+8]
5. (a) What are the limitations of Griffith's theory of fracture when applied to metals? what is the Orowan modification Griffiths theory?
   (b) Discuss briefly the gamma ray radiographic method and compare it with x-ray radiography. [8+8]
6. (a) Ni & Co either singly or in combination are added to steels in varying proportions to produce a wide range of super alloys. List out the most important of these alloys, give their properties and typical applications.
   (b) Name any two wrought super alloys. Give their composition, microsturcture properties and applications. [10+6]
7. (a) What types of alloys are included under the general heading, light alloys? List the uses of high purity and commercial pure aluminium.
   (b) What alloying elements are commonly used in commercial aluminium alloys? Explain their effect. [6+10]
8. Discuss the mechanisms of fracture in the following cases:
   (a) Brittle matrix system
   (b) Ductile matrix system. [8+8]

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Code No: R05412104 **R05** **Set No. 4**

IV B.Tech I Semester Examinations,November 2010
AIRCRAFT MATERIALS AND COMPOSITES
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What types of alloys are included under the general heading, light alloys? List the uses of high purity and commercial pure aluminium.
   (b) What alloying elements are commonly used in commercial aluminium alloys? Explain their effect. [6+10]
2. (a) Write the computational procedure for the determination of lamina strength.
   (b) Explain how a composites (FRA) elastic constant is found theorietically, when the fibres are in transverse and in longitudinal direction. [8+8]
3. (a) List and explain the parameters which affect the fracture toughness of a material.
   (b) Explain the role of different penetrant test methods. What are emulsifiers? Discuss. [6+10]
4. (a) Ni & Co either singly or in combination are added to steels in varying proportions to produce a wide range of super alloys. List out the most important of these alloys, give their properties and typical applications.
   (b) Name any two wrought super alloys. Give their composition, microsturcture properties and applications. [10+6]
5. Discuss the mechanisms of fracture in the following cases:
   (a) Brittle matrix system
   (b) Ductile matrix system. [8+8]
6. (a) Briefly classify ceramic matrix composites and give examples.
   (b) Discuss in detail continuous fiber reinforced ceramic matrix composites.[3+13]
7. (a) What are the limitations of Griffith's theory of fracture when applied to metals? what is the Orowan modification Griffiths theory?
   (b) Discuss briefly the gamma ray radiographic method and compare it with x-ray radiography. [8+8]
8. What are aramid fibres? How are they manufactured. Discuss their properties and applications. [16]

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Code No: R05412104 **R05** **Set No. 1**

IV B.Tech I Semester Examinations,November 2010
AIRCRAFT MATERIALS AND COMPOSITES
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What types of alloys are included under the general heading, light alloys? List the uses of high purity and commercial pure aluminium.
   (b) What alloying elements are commonly used in commercial aluminium alloys? Explain their effect. [6+10]
2. (a) Ni & Co either singly or in combination are added to steels in varying proportions to produce a wide range of super alloys. List out the most important of these alloys, give their properties and typical applications.
   (b) Name any two wrought super alloys. Give their composition, microsturcture properties and applications. [10+6]
3. What are aramid fibres? How are they manufactured. Discuss their properties and applications. [16]
4. (a) What are the limitations of Griffith's theory of fracture when applied to metals? what is the Orowan modification Griffiths theory?
   (b) Discuss briefly the gamma ray radiographic method and compare it with x-ray radiography. [8+8]
5. (a) Write the computational procedure for the determination of lamina strength.
   (b) Explain how a composites (FRA) elastic constant is found theorietically, when the fibres are in transverse and in longitudinal direction. [8+8]
6. (a) Briefly classify ceramic matrix composites and give examples.
   (b) Discuss in detail continuous fiber reinforced ceramic matrix composites.[3+13]
7. Discuss the mechanisms of fracture in the following cases:
   (a) Brittle matrix system
   (b) Ductile matrix system. [8+8]
8. (a) List and explain the parameters which affect the fracture toughness of a material.
   (b) Explain the role of different penetrant test methods. What are emulsifiers? Discuss. [6+10]

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Code No: R05412104 **R05** **Set No. 3**

IV B.Tech I Semester Examinations,November 2010
AIRCRAFT MATERIALS AND COMPOSITES
Aeronautical Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. What are aramid fibres? How are they manufactured. Discuss their properties and applications. [16]
2. (a) Briefly classify ceramic matrix composites and give examples.
   (b) Discuss in detail continuous fiber reinforced ceramic matrix composites. [3+13]
3. (a) What are the limitations of Griffith's theory of fracture when applied to metals? what is the Orowan modification Griffiths theory?
   (b) Discuss briefly the gamma ray radiographic method and compare it with x-ray radiography. [8+8]
4. (a) Write the computational procedure for the determination of lamina strength.
   (b) Explain how a composites (FRA) elastic constant is found theorietically, when the fibres are in transverse and in longitudinal direction. [8+8]
5. Discuss the mechanisms of fracture in the following cases:
   (a) Brittle matrix system
   (b) Ductile matrix system. [8+8]
6. (a) Ni & Co either singly or in combination are added to steels in varying proportions to produce a wide range of super alloys. List out the most important of these alloys, give their properties and typical applications.
   (b) Name any two wrought super alloys. Give their composition, microsturcture properties and applications. [10+6]
7. (a) What types of alloys are included under the general heading, light alloys? List the uses of high purity and commercial pure aluminium.
   (b) What alloying elements are commonly used in commercial aluminium alloys? Explain their effect. [6+10]
8. (a) List and explain the parameters which affect the fracture toughness of a material.
   (b) Explain the role of different penetrant test methods. What are emulsifiers? Discuss. [6+10]

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