BOARD OF STUDIES
NEW SOUTH WALES

2003 HSC Engineering Studies
Marking Guidelines

Question 11 (a)

Outcomes assessed: H1.1, H2.2, H4.3

MARKING GUIDELINES

Criteria	Marks
• Applies all four knowledge areas appropriately to aircraft design or construction	4
• Applies three knowledge areas appropriately to aircraft design or construction OR • Loosely associates all four knowledge areas	3
• Applies two knowledge areas appropriately to aircraft design or construction OR • Loosely associates three knowledge areas	2
• Applies only one knowledge area appropriately to aircraft design or construction OR • Loosely associates two knowledge areas	1

Question 11 (b) (i)

Outcomes assessed: H1.1, H2.1

MARKING GUIDELINES

Criteria	Marks
• Outlines well how improvements to materials have affected two features	3
• Outlines well how improvements to materials have affected one feature OR • Outlines basically how improvements to materials have affected two features	2
• Outlines basically how improvements to materials have affected one feature	1

Question 11 (b) (ii)

Outcomes assessed: H1.1, H2.2, H4.2

MARKING GUIDELINES

Criteria	Marks
• Discuss well the societal effects of changes to two features	3
• Discusses well the societal effects of changes to one feature OR • Outlines two societal effects	2
• Outlines one societal effect	1

Question 12 (a) (i)

Outcomes assessed: H3.1, H6.1, H6.2

MARKING GUIDELINES

Criteria	Marks
• Correct equations, working and/or answer	2
• Some understanding but incorrect answer	1

Question 12 (a) (ii)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• Two benefits, with explanation	2
• One benefit, with explanation OR • Lists two benefits with little or no explanation	1

Question 12 (a) (iii)

Outcomes assessed: H1.2, H2.1, H6.2

MARKING GUIDELINES

Criteria	Marks
• Answer discussing two factors	3
• An answer discussing one factor OR • States two factors	2
• States one factor	1

Question 12 (b)

Outcomes assessed: H3.1, H3.3

MARKING GUIDELINES

Criteria	Marks
• Good overall shape with some minor errors using a pictorial method	3
• Reasonable overall shape with some minor errors of a pictorial method	2
• Some aspects of major components in relative position	1

Question 13 (a)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• A description of the structure and resultant properties through the rail	3
• Description of structure and one property OR • Description of two properties	2
• Outline of structure OR • Description of one property OR • Identification of two properties	1

Question 13 (b)

Outcomes assessed: H3.1, H6.1, H6.2

MARKING GUIDELINES

Criteria	Marks
• Correct equations, working and/or answer	3
• Demonstrates a general understanding with some minor errors	2
• Demonstrates a limited understanding of the question	1

Question 13 (c) (i)

Outcomes assessed: H4.1, H6.1, H6.2

MARKING GUIDELINES

Criteria	Marks
• Describes how the magnetic field of the coil causes the coil to rotate due to attraction and repulsion of components	2
• Displays a limited understanding of the operation of an electric motor	1

Question 13 (c) (ii)

Outcomes assessed: H6.1, H6.2

MARKING GUIDELINES

Criteria	Marks
• Describes two applications for electric motors in transport systems	2
• Describes only one application of electric motors in transport systems OR • Describes two types of electric motors used in transport systems without describing an application	1

Question 14 (a)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Using acceptable method and/or correct solution	2
• Acceptable method – minor errors	1

Question 14 (b) (i)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Correct diagram shape and appropriate label of values	2
• Correct diagram shape and incorrect label of values OR • Incorrect diagram shape and correct label of values (calculations) OR • Appropriate calculations not applied to a diagram	1

Question 14 (b) (ii)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Correct equations, working and/or answer	3
• Correct method – but minor errors in calculations	2
• Limited understanding of the question demonstrated	1

Question 14 (c)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• Names another manufacturing process and contrasts two properties with those of powder formed gears	3
• Names another manufacturing process and contrasts one property with those of powder formed gears	2
• Outlines the properties of powder formed gears OR • Names an alternative forming process	1

Question 15 (a)

Outcomes assessed: H3.2, H6.2

MARKING GUIDELINES

Criteria	Marks
• Good explanation of airspeed indicator operation	3
• Reasonable explanation of airspeed indicator operation	2
• Poor explanation of airspeed indicator operation	1

Question 15 (b) (i)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• Demonstrates a reasonable understanding that aluminium forms a protective oxide layer which prevents further corrosion	2
• Basically explains that aluminium forms a protective or oxide layer	1

Question 15 (b) (ii)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• Identifies both an advantage and a disadvantage	2
• Identifies either one advantage or one disadvantage	1

Question 15 (c) (i)

Outcomes assessed: H6.2, H3.2

MARKING GUIDELINES

Criteria	Marks
• A good comparison of the nature of stress both on the ground and in flight	3
• A reasonable comparison of the nature of stress both on the ground and in flight	2
• A basic comparison of the nature of stress both on the ground and in flight	1

Question 15 (c) (ii)

Outcomes assessed: H6.2, H3.1

MARKING GUIDELINES

Criteria	Marks
• Correct equations, working and/or answer	3
• Demonstrates a general understanding with some minor errors	2
• Demonstrates a limited understanding of the question	1

Question 15 (d)

Outcomes assessed: H3.2, H6.2

MARKING GUIDELINES

Criteria	Marks
• Outlines two conditions which cause stalling	2
• Outlines one condition which causes stalling	1

Question 16 (a) (i)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• States an application for each material and explains why each is used	4
• States two applications but gives poor reasons OR • States one application with two reasons OR • Provides two good explanations of properties OR • States two applications and gives one reason	3
• States one application and explains why it is used OR • Provides a limited explanation of two properties OR • States two applications	2
• States one application plus a limited explanation of properties OR • Provides a good explanation on one material property	1

Question 16 (a) (ii)

Outcomes assessed: H1.2, H2.1

MARKING GUIDELINES

Criteria	Marks
• Describes two problems associated with cold drawing for this use and describes a heat treatment process at the various stages	3
• Describes two problems but does not describe the heat treatment process OR • Describes one problem and describes the heat treatment process	2
• Describes one problem OR • Describes the treatment process	1

Question 16 (b)

Outcomes assessed:H2.2, H4.1, H4.2, H4.3

MARKING GUIDELINES

Criteria	Marks
• Two changes identified and related societal effect for each discussed	4
• Two changes identified and one related societal effect discussed OR • Discussion of two societal effects with implied technological changes OR • One change identified and two related societal effects discussed	3
• One change identified with one related societal effect discussed OR • Two changes identified with unrelated effect(s)	2
• One change identified and one unrelated effect OR • Two changes with no discussion given OR • Two effects of technological change listed	1

Question 16 (c) (i)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Description of transmission from mobile phone to mobile phone	2
• Description of transmission from mobile phone to tower	1

Question 16 (c) (ii)

Outcomes assessed: H4.3, H2.2

MARKING GUIDELINES

Criteria	Marks
• Explains one effect and states two situations	2
• States two situations OR • Explains one effect OR • States one effect and one situation	1

Question 17 (a)

Outcomes assessed: H3.2, H4.1, H4.3

MARKING GUIDELINES

Criteria	Marks
• Good outline of both issues	2
• Good outline of one appropriate issue OR • Identification of two issues	1

Question 17 (b)

Outcomes assessed: H3.1, H3.3

MARKING GUIDELINES

Criteria	Marks
• Correct assembly and proportion of components in two views (some latitude with accuracy)	4
• Reasonable assembly and proportion of components	3
• Basic assembly and proportion of components	2
• Poor assembly and proportion of components	1

Question 17 (c) (i)

Outcomes assessed: H2.1, H3.1

MARKING GUIDELINES

Criteria	Marks
• Makes clear the relationship between the size and shape of members and the nature of the forces (tension/compression) acting on them	2
• Poor explanation of relationship of shape and size of member to nature of forces acting	1

Question 17 (c) (ii)

Outcomes assessed: H1.2, H2.1, H2.2, H4.1, H4.3

MARKING GUIDELINES

Criteria	Marks
• Discussion of at least one development related to textiles in shade areas	2
• Discussion of one development	1

Question 18 (a)

Outcomes assessed: H3.3, H4.1, H5.2

MARKING GUIDELINES

Criteria	Marks
• Discusses at least two points about CAD vs traditional methods	3
• Identifies two points, without discussion OR • Discusses one point	2
• Identifies one point	1

Question 18 (b) (i)

Outcomes assessed: H1.2, H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
• Description of a suitable forming process	2
• Identification of a suitable process	1

Question 18 (b) (ii)

Outcomes assessed: H1.2, H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
• Outline of 2 or more appropriate reasons related to service	2
• Outline of 1 appropriate reason related to service OR • Outline of 2 or more reasons not related to service	1

Question 18 (c)

Outcomes assessed: H3.3, H3.1

MARKING GUIDELINES

Criteria	Marks
• Correctly answer the question	3
• Demonstrates a general understanding with some minor errors	2
• Demonstrates a limited understanding of the question	1