

STUDENT EDUCATION NUMBER



GOVERNMENT OF SAMOA  
MINISTRY OF EDUCATION, SPORTS AND CULTURE

# Samoa Secondary Leaving Certificate

# DESIGN TECHNOLOGY

## 2018

## QUESTION and ANSWER BOOKLET

Time allowed: 3 Hours & 10 minutes

### INSTRUCTIONS

1. You have 10 minutes to read before you start the exam.
2. Write your Student Education Number (SEN) in the space provided on the top left hand corner of this page.
3. Answer ALL QUESTIONS. Write your answers in the spaces provided in this booklet.
4. If you need more space, ask the Supervisor for extra paper. Write your SEN on all extra sheets used and clearly number the questions. Attach the extra sheets at the appropriate place in the booklet.

STRANDS		Page	Time (min)	Weighting
<b>STRAND 1:</b>	DRAWING AND DESIGNING	2	45	25
<b>STRAND 2:</b>	HAND AND POWER TOOLS	6	27	15
<b>STRAND 3:</b>	MATERIALS	8	36	20
<b>STRAND 4:</b>	PROCESSING	14	54	30
<b>STRAND 5:</b>	TECHNOLOGY	25	18	10
<b>TOTAL</b>			<b>180</b>	<b>100</b>

Check that this booklet contains pages 2-27 in the correct order and that none of these pages is blank.  
**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

1. State the design problem for your independent project this year.

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SL 1

2. Identify the design solution that will best solve the problem stated above.

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SL 1

3. Sketch the best solution for problem stated above and provide dimensions.

SL 2

4. Define the term **border line**.

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SL 1

5. Name the two types of lettering and numbering used in technical drawing.

A. \_\_\_\_\_

B. \_\_\_\_\_

SL 1

6. What is the difference between a Cabinet and Cavalier drawing?

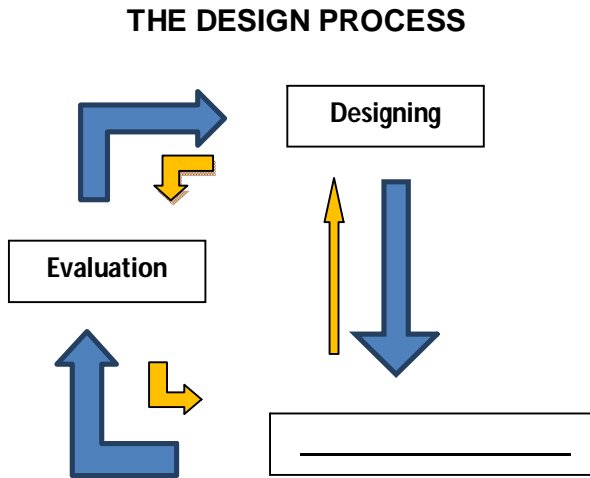
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SL 1

7. Name the missing stage of the design process in the diagram.



SL 2

8. Explain the purpose of the anti-clockwise arrows shown in the diagram above.

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SL 3

9. Discuss the importance of the specification before starting the building of a project.

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SL 4

10. Convert the following units and provide calculations.

(i) 12 feet = \_\_\_\_\_ mm

(2) 90 cm = \_\_\_\_\_ inches

SL 3

11. What is the difference between Orthographic and a Pictorial drawing.

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SL 3

12. Discuss the differences between a 1<sup>st</sup> and 3<sup>rd</sup> angle projection.

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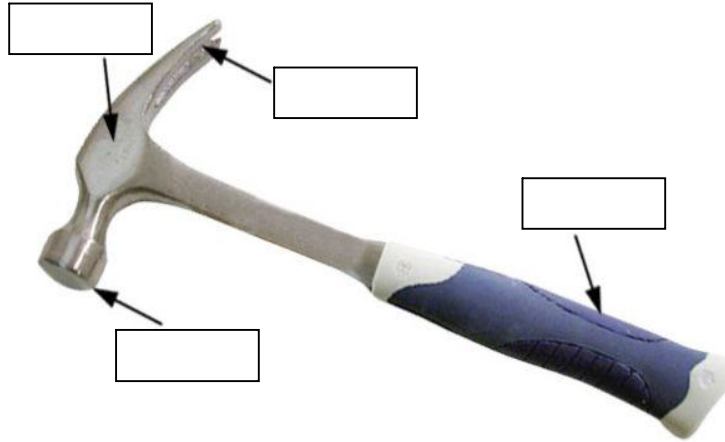
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SL 3

13. Label parts of the claw hammer below.



SL 1

14. Name a tool that is used to mark parallel lines across and along the timber.

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SL 1

15. Which tool is most suitable for holding large work while gluing for a long period of time. (Circle the right answer).

- A. Sash Clamp
- B. Quick Action Clamp
- C. G Clamp
- D. Vice

SL 1

16. Describe the usage of a *pincebar*.

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SL 2

17. Explain TWO differences between portable and cordless tools.

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SL 3

18. List FOUR personal protective equipment that you need to wear when operating a skill saw.

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SL 3

19. Discuss the importance of understanding different types of tools and their uses.

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SL 4

**INSTRUCTION:** ANSWER **Option 1** – Wood Materials **OR** **Option 2** – Metal Materials.

**OPTION 1: Wood Materials**

**20.** Sketch a *thunder shake defect*.

SL 1

**21.** Differentiate between local timber and overseas timber.

SL 3

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**22.** Name a ONE defect in timber warping.

SL 1

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**23.** Name ONE method of drying timber.

SL 1

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24. Draw a cross section diagram of a tree trunk.

SL 2

25. Define the term *toughness*.

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SL 1

26. Evaluate the quality of local and overseas timber in Samoa.

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SL 4

27. Discuss the process of *timber conversion*.

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SL 4

28. Explain the differences between *Twist and Spring*.

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SL 3

**IF YOU HAVE ANSWERED OPTION 1, DO NOT DO OPTION 2**

**OPTION 2: Metal Materials**

**‘Metal is an important resource material used in metal and construction work.’**

**29.** Name ONE type of non-ferrous metal.

\_\_\_\_\_

SL 1

**30.** Give ONE property of the metal you named in Number 29.

\_\_\_\_\_

SL 1

**31.** Select the best lubricant to loosen a rusty bolt and nut from a metal.

\_\_\_\_\_

SL 1

**32.** Discuss how the lubricant in your answer for Number 31 is applied.

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SL 3

33. Select the most suitable size of metal used in building the chassis of a car.

\_\_\_\_\_

SL 1

34. List the different type of metal materials that can be used in constructing a coffee table project.

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

SL 2

35. Describe the BEST method for *preserving metal*.

\_\_\_\_\_

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SL 3

36. Evaluate the quality of a non-ferrous metal in terms of strength, durability, hardness and ability to withstand stress.

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SL 4

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**37.** Evaluate THREE differences between the properties of wood and metal materials.

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SL 4

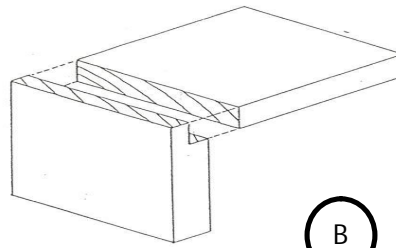
**INSTRUCTION:** ANSWER **Option 1** – Wood Technology **OR** **Option 2** – Small Engine and Automotive Mechanics.

**OPTION 1: Wood Technology**

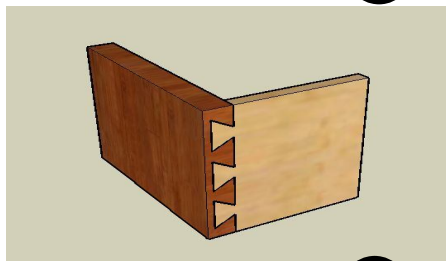
Study the diagram below to answer Number 38.



A



B



C



D

38. Name the types of Joints shown in the diagram above.

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

D. \_\_\_\_\_

SL 1

SL 1

SL 1

SL 1

39. Name the tool used to check the squareness of a project.

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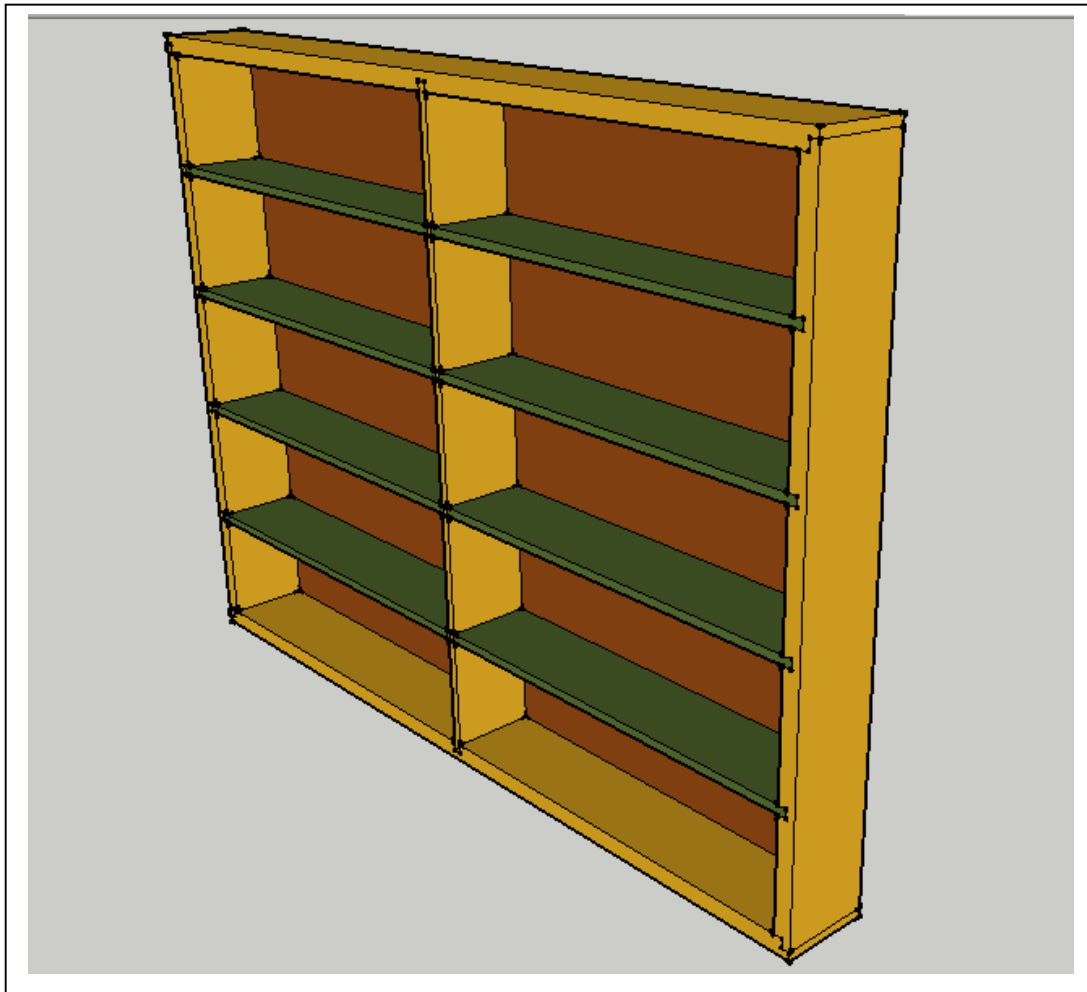
SL 1

40. Explain the process for making a *Corner Halving Joint*.

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SL 3

Use the diagram and your own knowledge to answer Number 41 and 42.





<b>Aspect</b>	<b>sizes</b>
Top	40 X 300
Bottom	40 X 300
Sides	40 X 300
Middle divider	20 X 300
Shelves	20 X 300
Back	10 mm Plywood
<b>Joint Used</b>	
Shoulder Lap Joint for the outer Frame	20 mm lap
Tongue and Groove for Shelves	20 mm groove on each side/top/bottom and 5 mm groove joint in the middle
<b>Project Measurement</b>	
Length	1200mm
Width	310 mm
Height	1000 mm
Vertical / Horizontal Space between Shelves	168 mm x 550 mm

**41** Construct a cutting list based on the drawing and information above.

	No. of Pieces	Length	Width	Thickness	Total
Top					
Bottom					
Sides					
Middle divider					
Shelves					
Back					

<b>SL 4</b>

42. Using the Table, calculate the total length of material needed for the project when placing an order at Bluebird Lumber .

SL 4

43. The cost for a 50 x 300 at Bluebird is \$15.00 per meter, \$14.00 for a 20 x 300 per meter and \$80 for 100mm plywood.

Do a costing of the materials needed for the Book Shelf (do not include screws, varnish, glue and nails).

SL 2

44. Give TWO types of drawings found in an Oblique Drawing.

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SL 1

45. An American gave a dimension of 3' x 6' to an Australian to cut a piece of plywood but the Australian only reads meters and millimeters.

What is the measurement in millimeters when converting a 3' x 6' into metric system?

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SL 1

46. What is the best way to fix a damaged surface of a timber with a claw hammer?

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SL 1

47. Sketch a box using a Two-Point Perspective.

SL 2

48. Explain *hardness* in properties of timber.

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SL 3

49. Clearly explain the process involved in sharpening a chisel.

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SL 4

**IF YOU HAVE ANSWERED OPTION 1, DO NOT DO OPTION 2**

**OPTION 2: Small Engine and Automotive Mechanics**

**50.** How many valves are there in an *eight cylinder engine*?

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SL 1

**51.** Define the following parts of an engine.

(a) *Valve*

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SL 1

(b) *Cylinder*

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SL 1

(c) *Piston*

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SL 1

**52.** Name a *common tool* used to service an engine.

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SL 1

**53.** How should tools be properly stored?

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SL 1

**54.** Describe the order of the 2 stroke cycle engine.

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SL 2

**55.** Describe how you would service a small engine.

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SL 2

**56.** Explain the main component of a 4 stroke engine.

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<b>SL 3</b>

**57.** Explain how to reduce excessive black smoke from engine exhaust.

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<b>SL 3</b>

**58.** Discuss how an engine operates.

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<b>SL 4</b>

59. Discuss the environmental impact of the motor vehicle industry in Samoa.

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SL 4

60. Name the missing parts of the vehicle below.



SL 1

SL 1

61. Discuss the purpose of a *serpentine belt* in a car.

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SL 4



Read carefully and then answer in the spaces below.

62. What is the advantage of using timber in building?

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SL 1

63. List TWO disadvantages of using timber in buildings.

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SL 2

64. Explain the process of *seasoning* timber.

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SL 3

**65.** Discuss TWO disadvantages of today's technology on the environment.

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SL 4

STUDENT EDUCATION NUMBER									

## DESIGN TECHNOLOGY

2018

(For Scorers only)

CURRICULUM STRANDS	Scores	Weighting
<b>STRAND 1: DESIGNING AND DRAWING</b>		25
<b>STRAND 2: TOOLS AND SAFETY</b>		15
<b>STRAND 3: MATERIALS</b>		20
<b>STRAND 4: PROCESSING</b>		30
<b>STRAND 5: TECHNOLOGY</b>		10
<b>TOTAL</b>		<b>100</b>