

**RISHIKUL SANATAN COLLEGE**  
**YEAR 12 - APPLIED TECHNOLOGY WORKSHEET**  
**QUESTION PAPER**

**INSTRUCTIONS**

1. Write all your answers in the Answer Book provided.
2. Answer all Questions with Blue or Black ballpoint pen and use pencils for all drawings.
3. You may use a calculator, provided it is silent, battery operated and non- programmable.
4. The paper is divided into three sections.

**All questions are compulsory.**

**SUMMARY OF QUESTIONS**

<b>SECTION</b>	<b>GUIDELINES</b>	<b>TOTAL MARK</b>	<b>SUGGESTED TIME</b>
A	There are <b>twenty</b> multiple choice questions. <b>All questions are compulsory</b>	<b>20</b>	60mins
B	There are <b>three</b> questions. <b>All questions are compulsory.</b>	<b>60</b>	70 mins
C	There is <b>one</b> <b>Compulsory Question.</b>	<b>20</b>	50 mins
	<b>TOTAL</b>	<b>100</b>	<b>180 minutes</b>

## SHEET 2

### SECTION A

(20 MARKS)

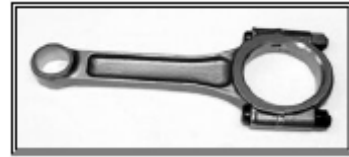
All the questions in this section are compulsory

**Use your Note Book and make notes on all the options given.**

1. Which of the following metals is classified as a ferrous metal?
  - A. tin
  - B. iron
  - C. lead
  - D. aluminium
2. Trees which are classified as hardwood can be identified by their
  - A. broad leaves.
  - B. coloured leaves.
  - C. leaf arrangement.
  - D. needle-shaped leaves.
3. The material which is used as an insulator in electrical wiring is
  - A. glass.
  - B. wood.
  - C. plastic.
  - D. carbon.
4. During combustion in a two stroke engine, compression takes place when
  - A. fuel ignites and pushes the piston.
  - B. the piston returns to the top of the cycle.
  - C. fresh fuel is sucked into the engine by the inlet.
  - D. unburnt gases are expelled with the exhaust fumes.
5. Which of the following is formed RSC TERM 1 A/TECH PAPER - JM when two or more metals are combined to form a new metal?
  - A. Alloy.
  - B. Pure metal.
  - C. Ferrous metals.
  - D. Non-ferrous metals.
6. Resistance in an electrical circuit is measured in
  - A. ohms.
  - B. volts.
  - C. ampere.
  - D. coulombs.
7. The **correct** footwear that will protect the foot from injury while working in a workshop is
  - A. leather boots.
  - B. covered boots.
  - C. high-cut boots.
  - D. steel cap boots.

8. What part of a combustion engine is shown below?

- A. piston ring
- B. rocker gear
- C. cylinder head
- D. connecting rod

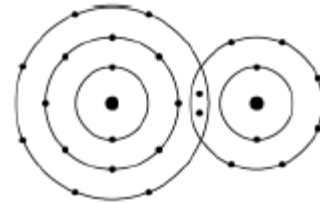


9. The **main** objective of the design process is to

- A. solve a problem.
- B. solve the specification.
- C. produce the correct dimensions.
- D. produce many possible solutions.

10. Which type of bonding is **best** described by the diagram given below?

- A. Ionic bonding
- B. Metallic bonding
- C. Covalent bonding
- D. Van der waals bonding



11. In design, big and small elements, black and white text, squares and circles, can all create

- A. unity in design.
- B. balance in design.
- C. contrast in design.
- D. repetition in design.

12. The confined space in which combustion occurs in an internal-combustion engine is called the

- A. exhaust.
- B. cylinder.
- C. chamber.
- D. carburetor.

13. The portable electric machine that concrete and can remove paint and rust

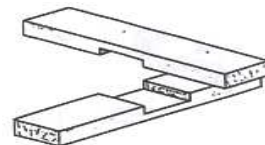
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can cut metal surfaces, tiles, is the

- A. buffer.
- B. router.
- C. orbital Sander.
- D. angle Grinder.

14. What type of joint is shown in the diagram on the right?

- A. dowell
- B. dovetail
- C. cross-halving
- D. mortise and tenon



15. In a two-stroke petrol engine, the part that mixes the fuel and the air is the

- A. cylinder.
- B. inlet port.
- C. carburettor.
- D. combustion chamber.

16. Which type of bonding is formed by a strong **electrostatic attraction** between opposite charges?

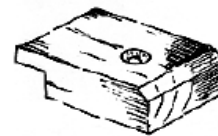
- A. Ionic bonding
- B. Metallic bonding
- C. Covalent bonding
- D. Van der waals bonding

17. The distance covered by the movement of the piston from the TDC to the BDC is known as the

- A. bore.
- B. stroke.
- C. revolution.
- D. compression.

18. The method of fixing table top shown on the right is a

- A. metal button
- B. pocket screwing
- C. wooden button
- D. nailing



19. A sharp edge or corner on a piece of timber is known as

- A. base
- B. arris
- C. edging
- D. flush

20. The voltage induced by a two-stroke engine is produced by the

- A. magneto.
- B. spark plug.
- C. induction coil.
- D. high tension wire.

**SECTION B**

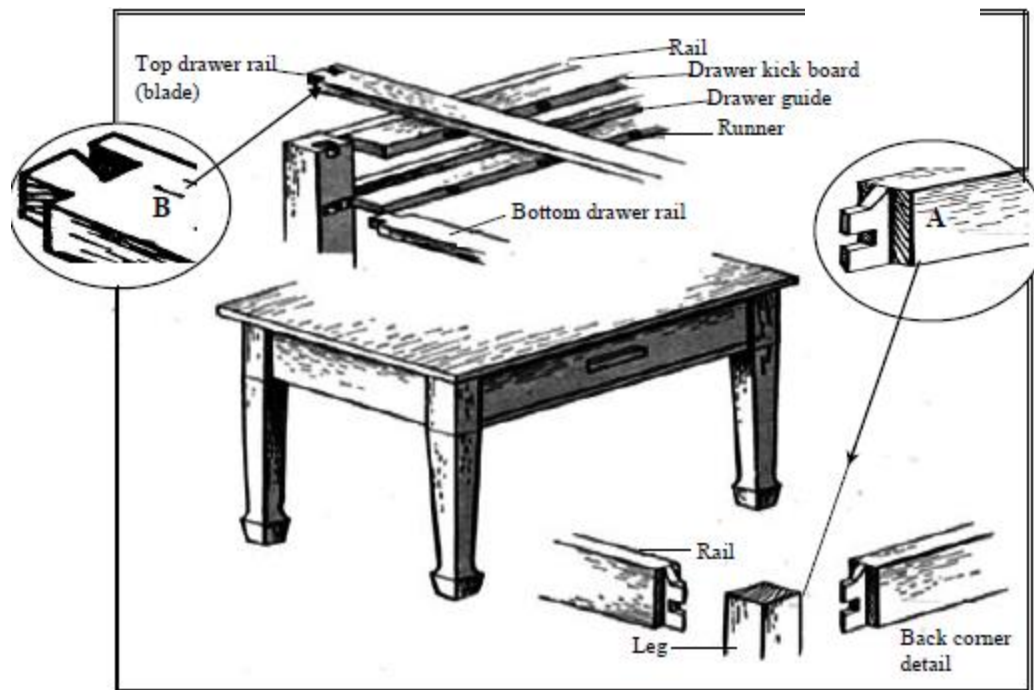
**(60 MARKS)**

The **three** questions in this section are all compulsory. Each question is worth **20 marks**

**QUESTION 1**

**(20 marks)**

(a) Study the diagram of a table given below and answer the questions that follow.



- (i) Name the joints labelled **A**. **(1 mark)**
- (ii) Explain **one** advantage of using the joint labelled **B**. **(1 mark)**
- (iii) Explain the purpose of the drawer guide. **(1 mark)**
- (iv) Explain the **main** steps of constructing the joint labelled **B**. **(2 marks)**
- (b) (i) Explain the purpose of sanding sealers in the finishing process. **(1 mark)**
- (ii) Explain why the back member of a drawer is narrower in width compared to the side and front members. **(1 mark)**
- (iii) State **three** reasons for using varnish for finishing a *dakua* tabletop. **(3 marks)**
- (iv) Explain how narrow strips of timber can be joined to form a large tabletop. **(1½ marks)**

(vi) Explain why screwing of tabletops to table frames is preferred over nailing. (1 mark)

(vii) State the **three** fastening methods using screws to fix a tabletop to the table frame. (3 marks)

(c) (i) Name a finish that can be applied to the plywood top. (1 mark)

(ii) All timber is obtained from trees that are generally classified as either softwoods or hardwoods. Give two differences between a softwood tree and a hardwood tree. (2 marks)

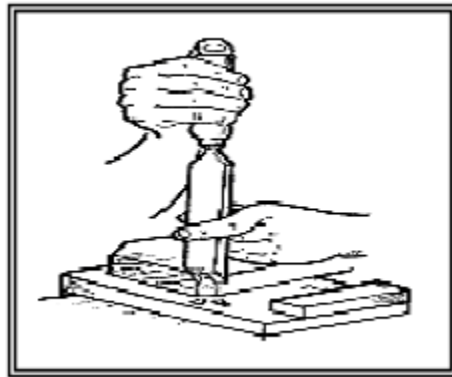
(iii) State a function of the cambium layer in a growing tree. (1½ marks)

## SECTION B

### QUESTION 2

(20 marks)

(a) Study the diagram given below and answer the questions that follow.



(i) Name the woodworking hand tool shown in the diagram. (1 mark)

(ii) Explain the process carried out in the diagram. (1 mark)

(iii) Explain the purpose of the process. (1 mark)

(b) Manufactured boards such as the core boards and abrasives are commonly used in school workshops.

(i) Describe a core board. (1 mark)

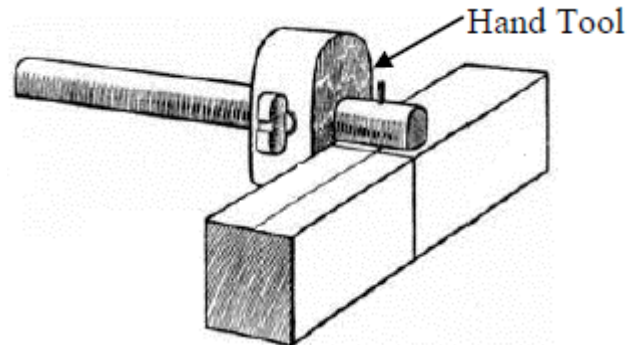
(ii) Explain the **main** advantage of a core board. (1 mark)

(iii) List the **four** features one must consider when buying abrasives at the hardware shop. (2 marks)

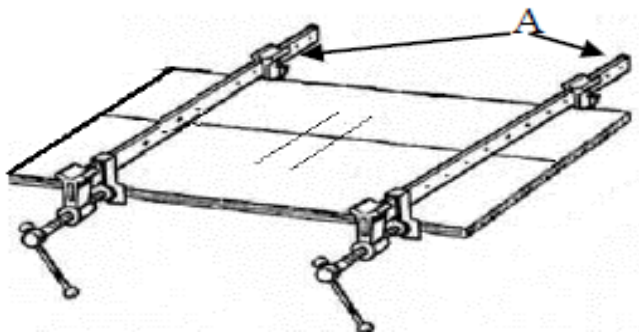
(c) Study the diagram given below

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and answer the questions that follow.



- (i) Name the hand tool shown in the diagram. **(1 mark)**
- (ii) Explain the **process** being carried out. **(1 mark)**
- (iii) Sketch the blade of a rip saw, showing the teeth and label the teeth angles. **(2 marks)**
- (iv) Explain the **safe** method of extracting long nails from timber with minimum effort. **(1 mark)**
- (vi) With the help of a sketch, explain how to use a square to test an edge of a piece of timber for squareness. **(2 marks)**
- (d) (i) Describe what a manufactured board is and name **one** type of manufactured boards. **(2 marks)**
- (ii) Give **two** advantages of manufactured boards. **(1 mark)**
- (e) Study the diagram of a woodworking process and answer the questions that follow.



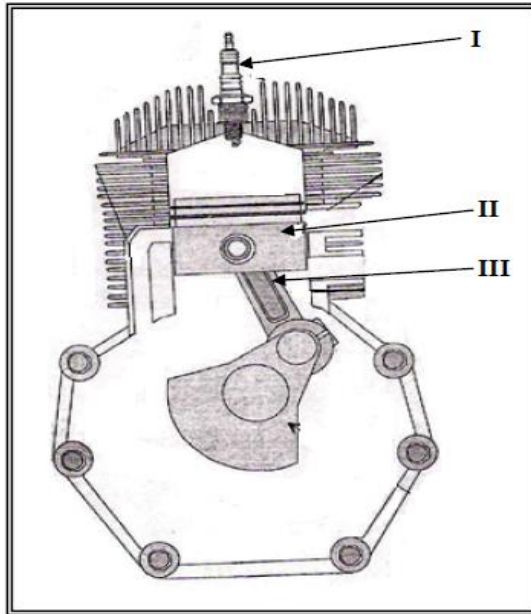
- (i) Name the woodworking tools labeled **A** in the diagram. **(1 mark)**
- (ii) Explain the process being carried out. **(1 mark)**
- (iii) Explain a fault in the process carried out. **(1 mark)**

**SECTION B**

**QUESTION 3**

**(20 marks)**

The diagram given below shows parts of a two stroke engine.  
Study the diagram and answer the following questions.



(i) Name the parts labelled **II** and **III** in the diagram. **(2 marks)**

(ii) What is the purpose of part **I** in the diagram? **(1 mark)**

(iii) Explain briefly the purpose of the following parts in a small engine:

1. Piston
2. Carburettor
3. Fuel pump

**(3 marks)**

(iv) Explain how a two- stroke engine is lubricated and cooled. **(2 marks)**

(vi) Name the parts that provide the following functions in a two- stroke engine:

- I. Surrounds and protects all other parts of the engine.
- II. Traps dirt and sediment from the gas before it is delivered to the carburetor.
- III. Ignites the air and fuel mixture.

**(3 marks)**

(vii) Explain **one** possible problem which can arise if the air filter is blocked. **(1 mark)**

(ii) Explain the function of the crankshaft in a two-stroke engine. **(1 mark)**

(iii) State **three** advantages of a two-stroke engine over a four-stroke engine. **(3 marks)**



•  
(d) (i) Explain briefly the functions of the following parts of a small engine:

1. Cylinder Head
2. Crankshaft
3. Muffler

**(3 marks)**

(ii) Name the component that creates electricity in the two stroke engine.

**(1 mark)**

**SECTION C                      DESIGNING                      (20 MARKS)**

**Problem**

Desktop computers have been the preferred type of home computing device which consists of a central processing unit (CPU), a monitor and the keyboard. While desktop computers are likely to remain in an average household, the setting up of all the components at one convenient place for the user remains an issue.

**Design Brief**

Design a computer table that can be used at home.

**Specification:**

The computer table should:

- have sufficient space for writing;
- have moveable keyboard compartment;
- have shelves to store note pads and stationery;
- have provision for cables to be installed neatly;
- have provisions for a standard size monitor and CPU; and
- been made from the combination of the three main materials (wood, metal and plastic).

**Requirements**

(a) Produce **three** pictorial **freehand** sketches of possible solutions. Label the parts and list important points. **(6 marks)**

(b) Make a pictorial drawing of the final solution from the **three possible solutions**. **(3 marks)**

(c) Make a detailed drawing of **one** component. **(4 marks)**

(d) List the materials needed for the construction of the computer table. **(4 marks)**

(e) Evaluate your design under the following headings:

(i) Cost

(ii) Functionality

(iii) Availability of materials

**(3 marks)**

**THE END**