E102A Fitting Assignment

SECTION A **50 MARKS**

For each question in part A, identify the response you consider best answers the question by placing its identifying letter in the space provided on the **separate answer sheet**.

1 MARK awarded for each correct answer.

1) When using a stock and die to produce a thread, a second cut is often made with the die nut flipped 180°. This is done to:

   a) ensure that the thread depth is the same over the entire length

   b) allow the cut to be made in two passes to prevent over-heating

   c) reduce the pressure applied to the cutting teeth

   d) break off the material forming in the flutes of the die

2) "Manual metal arc", "MIG" and "TIG" are:

   a) brazing methods

   b) chemical adhesives

   c) soldering methods

   d) welding methods

3) Flux used when soldering electrical conductors must:

   a) be non-corrosive

   b) contain acid

   c) have low alkalinity

   d) include a binding agent

4) When marking out sheetmetal, the **datum edge method** is used because:

   a) it saves time, and therefore money

   b) it is the safest method when using sheetmetal

   c) it gives a greater degree of accuracy

   d) it allows one edge of the work to be marked

5) The edges of sheetmetal are often folded at 90° to:

a) make the sheet more rigid
b) minimise wastage
c) indicate a datum edge
d) create a safe edge

6) In an **isometric** sketch, at what angle to the horizontal are receding lines drawn?

a) 15°
b) 30°
c) 45°
d) 60°

7) When a pop-rivet mandrel doesn't break with the first squeeze of the handles:

a) the rivet is defective and should be removed by drilling
b) the mandrel should be removed using a pair of pliers
c) open the handles, slide the nose down the mandrel and squeeze again
d) the material can no longer be fastened correctly

8) The term used to describe a hole that a screw will fit through without binding is called a:

a) countersink hole
b) threading hole
c) tapping hole
d) clearance hole

9) Screwdrivers used for electrical maintenance work must have:

a) captive screw facilities
b) a red handle
c) a parallel tip
d) an insulated shank

10) Hand taps are usually provided in sets of three to allow:

a) cutting of different pitch threads
b) threading of different materials
c) progressive tapping of blind holes
d) spare taps in case of breakage

11) As a spanner's size increases, so does it's length. This is to:

a) apply greater turning effort to larger sized nuts and bolts
b) reduce the chances of breaking the bolt being tightened
c) allow the operator more room to move
d) increase the distance the hand must travel in case of slippage

12) The **datum edge method** of marking out requires all measurements to be taken:

a) from a single point
b) from a common edge
c) using a standard tolerance
d) using a datum rule

13) When joining sheet-metal by pop-riveting, it's important to match the rivet material with the type of metal to be joined to minimise the risk of:

a) material damage
b) the rivet being only half set
c) leakage through the joint
d) corrosion occurring

14) **Deburring** of sheet-metal can be performed using a:

a) file
b) centre punch
c) hacksaw
d) cold chisel

15) If a piece of sheetmetal has been **galvanised**, this means that:

a) it has a prepared surface for marking out
b) it has been given a corrosion resistant coating
c) the material has been designed for spot welding
d) it has a surface that can be readily painted

16) Identify the tool shown in Figure 1:

a) club hammer
b) ball pein hammer
c) mash hammer
d) soft face hammer

Figure 1

17) To scribe an arc on a metal surface, the most appropriate tool would be:

a) dividers
b) jenny calipers
c) a scriber
d) a surface gauge

18) Which of the following materials provides the highest degree of protection against corrosion while also providing good mechanical strength?

a) Stainless steel
b) Aluminium
c) Zincalume
d) Colourbond steel

19) Identify the tool shown in Figure 2:

a) cable cutters
b) combination pliers
c) side cutters
d) tin snips

Figure 2

20) Identify the item shown in Figure 3:

a) internal circlip
b) external circlip
c) wave washer
d) spring washer

Figure 3

21) The process of **silver soldering** requires a high temperature. This is usually achieved using:

a) an induction furnace

b) a high powered soldering iron

c) an oxy-acetylene set

d) liquid petroleum gas

22) Prior to dismantling an electric motor, the end shields should be marked to indicate their original position to allow for correct re-assembly. These marks are called:

a) indicator marks

b) punch marks

c) reassembly marks

d) witness marks

23) The most appropriate drill bit for drilling a 20mm hole through a piece of timber would be a:

a) spade bit

b) high speed twist drill

c) tungsten tip drill bit

d) jobber drill bit

24) Identify the screw head type shown in Figure 4:

a) allen head

b) cheese head

c) countersunk head

d) cup head

Figure 4

25) Identify the item shown in Figure 5:

a) split pin
b) roll pin (or spring pin)
c) tapered key
d) drift rod

Figure 5

26) The following photo shows the belt and spindle arrangement used for speed adjustment on a bench drilling machine…

How would you **increase** the speed of the drilling machine?

a) Move the belt up at both ends
b) Move the belt down at both ends
c) Move the belt up at the motor end only
d) Move the belt down at the motor end only

27) Identify the power tool shown in Figure 6:

a) battery driver drill
b) pistol grip drill
c) impact drill
d) rotary hammer drill

Figure 6

28) Identify the tool shown in Figure 7:

a) vice grips
b) multigrips
c) combination pliers
d) shifting spanner

Figure 7

29) Identify the power tool shown in Figure 8:

a) angle grinder
b) circular saw
c) jig saw
d) wall chaser

Figure 8

30) Identify the item shown in Figure 10:

a) flat washer
b) spring washer
c) star washer
d) tabbed washer

Figure 10

31) Identify the tool shown in Figure 11:

a) dividers
b) inside calipers
c) jenny calipers
d) outside calipers

Figure 11

32) Identify the tool shown in Figure 12:

a) external circlip pliers
b) flat nose pliers
c) internal circlip pliers
d) long nose pliers

Figure 12

33) Identify the tool shown in Figure 14:

a) combination pliers
b) gas pliers
c) multigrips
d) vice grips

Figure 14

34) Flux is used when soft soldering to:

a) improves the conductivity of the joint
b) remove oxides from the metal surfaces being joined
c) act as a binding agent to strengthen the joint
d) help the solder to melt when heated

35) If a twist drill is sharpened **without** lip clearance, the drill bit will:

a) cut too quickly
b) drill over-sized holes
c) overheat rapidly
d) drill under-sized holes

36) Pilot holes are normally drilled:

a) when working with brittle material
b) in every type of drilling operation
c) by hand only
d) before drilling large holes

37) With regard to soft soldering, the process of **tinning** usually refers to:

a) coating the soldering iron with solder prior to joining
b) twisting conductors together before soldering
c) the use of non-corrosive flux when soldering
d) the application of solder to individual parts before joining

38) When soldering using resin core solder, care should be taken to avoid:

a) resin coming into contact with the skin
b) touching the solder with bare hands
c) inhaling fumes produced during soldering
d) applying excessive heat to the solder

39) When tapping or threading, the cutting tool should be backed off a quarter of a turn at regular intervals to:

a) break-off material chips forming in the flutes

b) prevent the cutting tool from overheating

c) relieve pressure on the cutting teeth of the tool

d) allow the cutting compound to penetrate effectively

40) Establishing a **job procedure** before starting a job:

a) ensures that difficult work can be sub-contracted to other companies

b) allows you to check if equipment will be available for use when you need it

c) helps employers to keep track of their employee's exact location

d) will ensure that material will always be delivered to the job at exactly the right time

41) A diagram commonly used to show how a piece of equipment is assembled is called:

a) a composite view

b) an exploded view

c) an isometric view

d) an oblique view

42) Identify the tool shown in Figure 15:

a) centre punch

b) drift punch

c) dolly punch

d) impact driver

Figure 15

43) Identify the tool shown in Figure 17:

a) cable cutters
b) vice grips
c) side cutters
d) tin snips

Figure 17

44) Identify the tool shown in Figure 18:

a) ball pein hammer
b) club hammer
c) mash hammer
d) soft face hammer

Figure 18

45) The part of a twist drill that does the cutting is called the:

a) lip
b) flank
c) land
d) flute

46) The depth gauge on a Bench Drilling Machine is typically used when drilling:

a) deep holes
b) large holes
c) blind holes
d) through holes

47) Identify the tool shown in Figure 20:

a) bearing puller
b) combination set
c) multigrips
d) outside calipers

Figure 20

48) Identify the tool shown in Figure 21:

a) combination spanner
b) open ended spanner
c) ring spanner
d) shifting spanner

Figure 21

49) Identify the tool shown in Figure 22:

a) pipe threader
b) stock and die
c) tap wrench
d) thread gauge

Figure 22

50) Identify the tool shown in Figure 23:

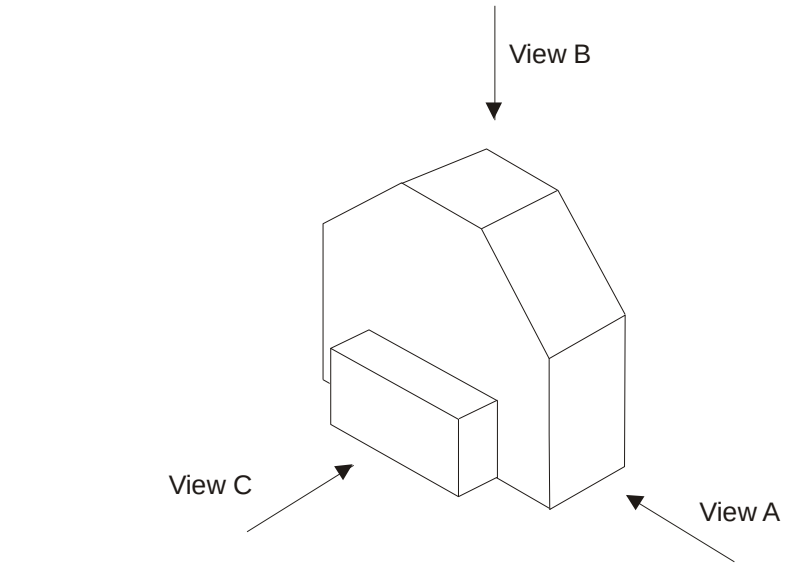
a) feeler gauge
b) spark gap gauge
c) surface gauge
d) thread gauge

Figure 23

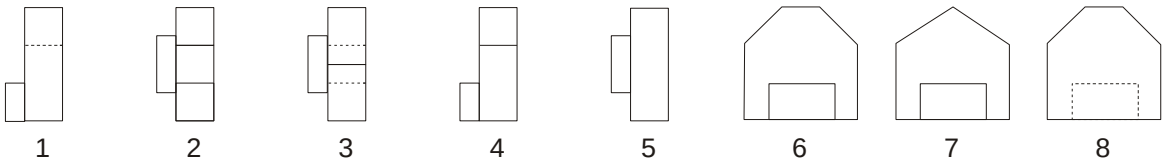
SECTION B **30 marks**

Blank spaces in the following statements represent missing words, phrases or quantities. Write the appropriate word, phrase or quantity in the spaces provided on the answer sheet.

1. Select the correct views of the following object from the drawing shown below and write the drawing number for each view in the table provided.



View	*Drawing No.*
A	
B	
C	



/3

2. Before doing any practical work, it's important to spend time planning. From the options listed below, select those that may result from not planning. ? *(Select **ALL** that apply. If you make a wrong selection you will score **zero** for this question*)

- ☐ **Work being done wrongly**
- ☐ **Lost work time**
- ☐ **Wasted materials**
- ☐ **Equipment not being available**
- ☐ **Injuries to workers**

/3

3. List two important considerations when fitting a blade to a **hacksaw**.

(i)

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(ii)

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/2

4. What is the main difference between a **hand** file and a **flat** file?

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.....

/1

5. List three things you would be able to tell about a thread that was specified as M8 x 1.25.

(i)

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(ii)

.....

(iii)

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/3

6. Where there is no tapping chart available, what size tapping hole would you need to drill for an **M10 x 1.5** thread?

Tapping hole size..... /1

7. Which of the following precautions apply when using chemical adhesives? *(Select **ALL** that apply. If you make a wrong selection you will score **zero** for this question*)

- ☐ **Smell the product before use**
- ☐ **Apply in a ventilated area if possible**
- ☐ **Wear appropriate PPE**
- ☐ **Read the product label for Safety Directions**

/1

8. List at least three (3) things to be checked before using a portable electric power tool.

(i)
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(ii)
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(iii)
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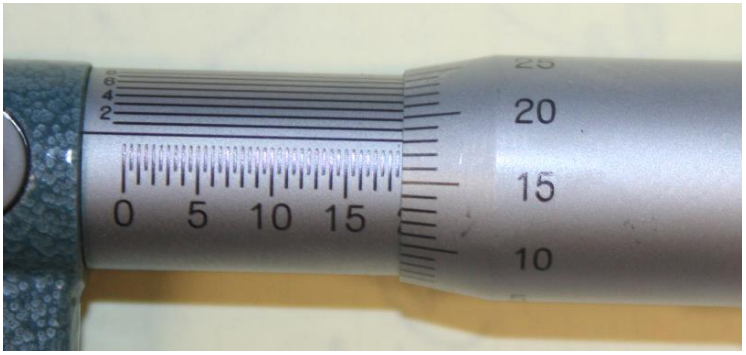
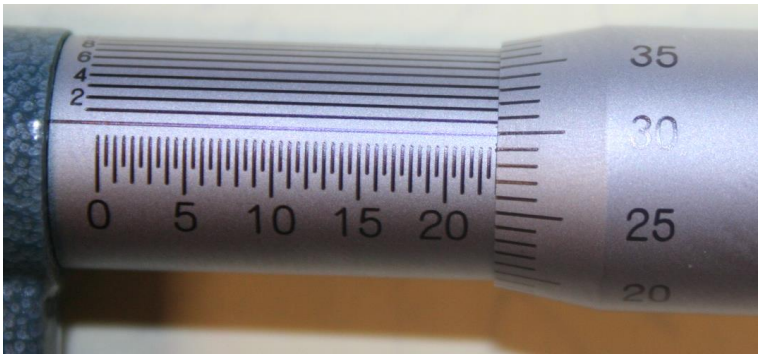
/3

9. Determine the following micrometer reading...



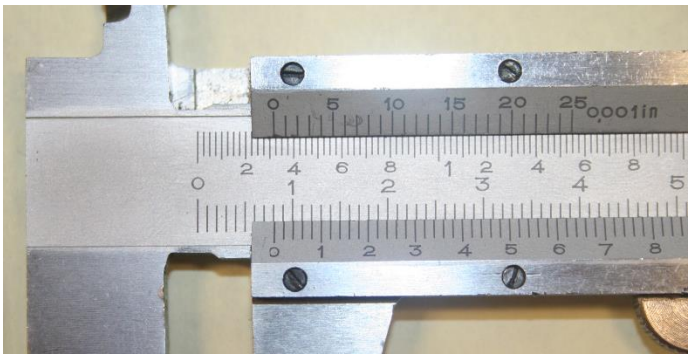
Reading .....
...../1

10. Determine the following micrometer reading...



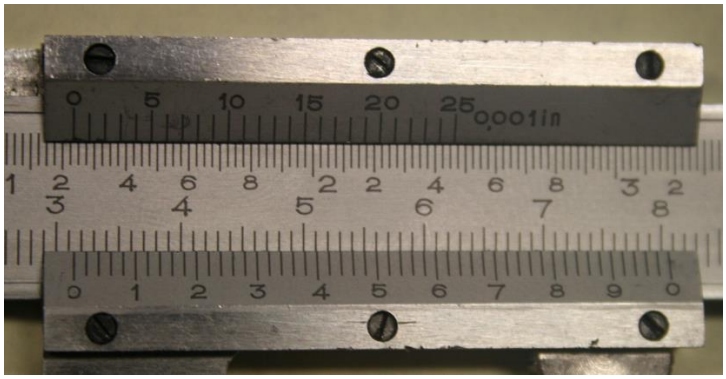
Reading.....
...../1

11. Determine the following vernier caliper reading...



Reading.....
...../1

12. Determine the following vernier caliper reading...



Reading.....
...../1

13. A piece of electrical equipment is to be manufactured from a set of engineering drawings. Listed below are a number of dimensions taken from the drawings. For each dimension, determine the maximum and minimum allowable dimensions on the finished product based on the allowable tolerances given.

Dimension	Tolerance	Maximum dimension	Minimum dimension
300 mm	± 1mm		
160 mm	± 0.5mm		
20 mm	+ 0mm – 2mm		

/3

14. Select a suitable portable electric power tool for the following tasks…

Installing screws into softwood

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Drilling a 13mm hole into hardwood

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Cutting a square hole in a panel to fit a meter

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/3

15. List three (3) safety precautions that need to be taken when soft soldering…

(i)

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(ii)

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(iii)

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.....

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/3

***************** END OF EXAMINATION*****************