

2011 Technological Studies

Standard Grade General

Finalised Marking Instructions

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3. A pneumatic cheese press is shown.



Marks

RNA

3 2

1 0

1

0

KU

An incomplete circuit diagram for the cheese press is shown below.

- (a) Complete the diagram by:
 - (i) selecting the correct pneumatic symbols from the table to form the 3/2, Push Button, Spring Return Valve;



					Marks	
				KU	RNA	
3.	(cont	inue	d)			
	Pneumatic systems are in common everyday use.					
	(b)	(b) State the name of the pneumatic symbols shown below.				
				2 1		
		1	Shuttle (Valve) 2 Restrictor 3 Solenoid	0		
	Safet	y is a	always important when working with pneumatics.			
	(c) State two safety precautions which must be followed when working with pneumatics.					
		1	Safety goggles/ensure air lines are securely fixed	2		
		2	Do not direct compressed air at anyone/in contact with skin	1 0		
	(d)	Sta	te two advantages of using compressed air as an energy source rather than			
	()	hyd	Iraulics (oil) or electricity.			
		1	Clean	2		
		2	Readily available/economical/reliable	1 0		
			Do not accept cheap			



				Marks	
				KU	RNA
4.	(conti	nued			
	(
	(c)	The	mechanism shown below is used in an alternative can crusher.		
			B B		
		(1)	Chata the name of monto (A) and (B)	0	
		(1)	State the name of parts (A) and (B).	2	
			A Rack B Pinion	0	
			1 KU for incorrect order		
		(ii)	State the change in type of motion.		
			Linear to Rotary	2	
			or	1	
			Rotary to Linear	0	

Marks KU **RNA** 5. A technician is investigating the circuit below. 390 Ω 1.5 kΩ റ 270 Ω Calculate the total resistance of the **parallel** branch. (a) (i) 390×270 **1 RNA for substitution** R_n 390 + 270 105300 R_n 2 660 1 159·5 Ω 1 RNA for correct answer from given working 0 R_p (ii) Calculate the total circuit resistance. FTE from (a) (i) **R**_T = 1500 + 159.5**1 RNA for substitution** 2 1 1 RNA for correct answer from given working 0 = **1659·5** Ω (b) Complete, with reference to the Data Booklet, the table below by inserting the missing colour bands for the resistors. correct rows **Resistor Value** Colour band 1 Colour band 2 Colour band 3 1 1·5 Ω Green Red Brown 270 Ω Red Violet 1 **Brown** 3 2 390Ω White Brown 1 Orange 1 0 There are many different types of resistor. (c) State the name of the electronic symbols shown below. 3 2 1 Variable resistor 2 Thermistor 3 Light Dependent 1 **Resistor (LDR)** 0 (not pot)

Marks KU **RNA** (continued) 5. The technician sets up a circuit as shown below. Power Supply Resistor R 0.025 A 11.50 V онма OHMS VOLTS VOLTS Using the meter readings above: (d) calculate the resistance of resistor R. $\frac{V}{I}$ R = 11.5**1 RNA for substitution** = 2 0.025 1 460 Ω 1 RNA for correct answer from given working 0 = Draw the circuit symbol for: (e) (i) an ammeter 1 А 0 (ii) a voltmeter. 1 V 0



		Ma	Marks		
The	diagram below shows all the ways in which heat is lost from a house.	KU	RNA		
(a)	State two methods to reduce energy loss within the house.				
	1 Loft insulation/cavity wall insulation/etc	2			
	2 Triple or double glazing/draught excluders/etc	1 0			
(b)	 Complete the energy conversion statements for each of the given products using the list below. Potential Kinetic Heat Chemical Electrical 				
	Nuclear Sound Light Magnetic				
	(i) Gas cooker		2 1		
	Chemical energy is converted to heat energy	ergy.	0		
	(ii) A wind-up radio		2 1		
	Kinetic energy is converted to sound energy	ergy.	0		
	(iii) Washing machine		2 1		
	Electrical energy is converted to kinetic or energy is converted to heat	ergy.	0		
Winc	is a renewable energy source used to generate electricity.				
(c)	State two other sources of renewable energy.				
	4 Maria hudro eta	2			
	wave, hydro etc	1			

8. A warning system on a school minibus is operated by a microcontroller



Marks

RNA

KU

Part of the control program includes a sub-procedure 'warning' which will activate when the minibus' reverse gear is engaged.

The sequence is as follows:

- a buzzer and lights go on;
- a delay of 1/2 second;
- the buzzer and lights go off;
- a delay of ½ second;
- only when the reverse gear is disengaged the sequence ends and returns to the main program

Input Connection	Pin	Output Connection
	7	
	6	
	5	Buzzer
	4	
	3	Lights
	2	
Reverse gear sensor	1	
	0	



[END OF MARKING INSTRUCTIONS]