

GCSE REVISION QUESTIONS

ELECTRONIC PRODUCTS

N HUMPHREY

GCSE ELECTRONIC PRODUCTS REVISION

Whilst Electronics is essentially a practical subject, an understanding of the theory is essential if progress is to be made.

Whilst there are a number of revision guides for the other areas of Design and Technology, to date there have been no revision guides produced for GCSE Electronic Products.

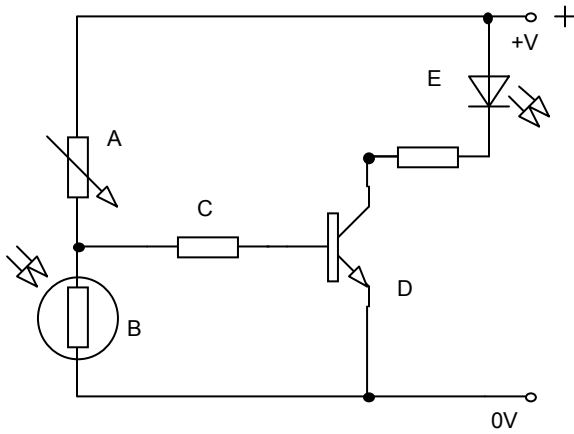
One of the most effective ways to prepare for examinations is to practice examination style questions. With this in mind the author has set out to produce a revision guide based on past GCSE questions and on typical questions where pupils need to demonstrate their knowledge and understanding.

Questions cover component identification, resistor colour code, calculations involving resistors and capacitors, case designing, Health and safety, electronics in society, case manufacturing and much more.

Many of the questions relate directly to practical work that should have been undertaken during the course.

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1. Name the components in the circuit below.



- A. _____
- B. _____
- C. _____
- D. _____
- E. _____

2. Name the two components that make up the potential divider.

3. Name the logic gate below



4. Complete the truth table below

A	B	P
0	0	
0		1
	0	1
1		1

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5. A lathe in a workshop will only work if **All** the following conditions are satisfied.

- i) Material is in the chuck.
- ii) A cutting tool is in the tool post.
- iii) The chuck guard is in place.

Draw a circuit diagram only using two input logic gates.

6. What does the 4th band on a resistor indicate _____

7. What does the term preferred value mean _____

8. Name two safety precautions when using a drilling machine

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9. Using the table below calculate the value of the following resistors

Colour	1 st Band	2 nd Band	3 rd Band
Black	0	0	-
Brown	1	1	0
Red	2	2	00
Orange	3	3	000
Yellow	4	4	0000
Green	5	5	00000
Blue	6	6	000000
Violet	7	7	0000000
Grey	8	8	
White	9	9	

- i) Brown Black Red Gold _____
- ii) Yellow Violet Orange Gold _____
- iii) Brown Black Green Gold _____

10. Describe the stages in manufacturing a PCB in a school workshop. Do not include the production of the artwork or the assembly of the PCB.

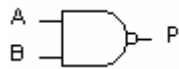
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11. Complete the following statements

Transistor Thyristor Diode Light Dependant Resistor
Capacitor Thermistor FET

- i) A _____ conducts current in one direction only
- ii) A _____ has a drain, gate and source.
- iii) A _____ is used to detect temperature

12. Name the logic gate below



ii) Complete the truth table below.

A	B	P
0	0	
0		1
	0	1
1	0	

13. i) On the IC shown below indicate pin 3 and pin 7.



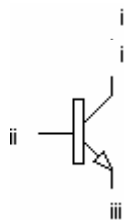
ii) Name two ways in which pin 1 of an IC can be identified.

14. Name two ways in which the cathode can be identified on an LED

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15. Using notes and sketches describe how you could stop the two legs of an LED from touching.

16. Name each of the connections on the transistor below. Name the part of the circuit that each of the connections is made to.



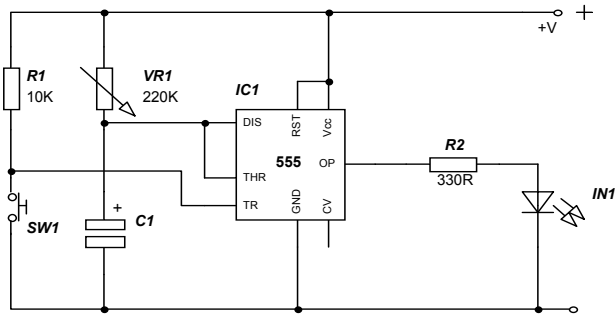
i) _____

ii) _____

iii) _____

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17.



i) Underline the name of the circuit above

Monostable Astable Bistable

ii) Name the two components that make up the timing part of the circuit

iii) Calculate the time delay ($T = R \times C$) given that $C = 100\mu\text{F}$ and $R = 220\text{K}$

18. What is meant by the term polarised _____

19. What does the term MDF stand for _____

20. What does the term CAD stand for

C _____ A _____ D _____

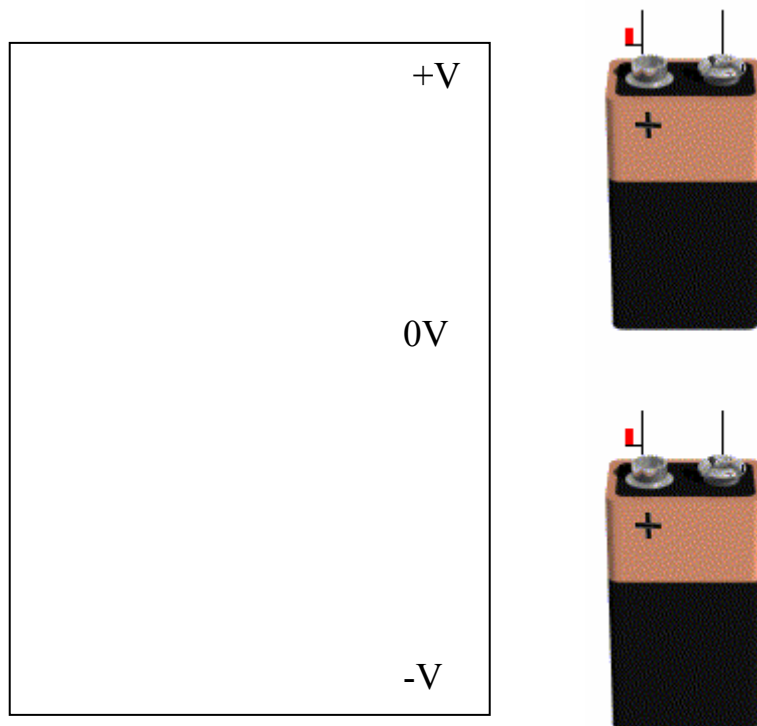
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21. You have been asked to design the logic part of an alarm system. The alarm will sound if any of the input sensors are activated as follows:

- A) If a pressure mat is stepped on
- B) If a PIR detector detects movement
- C) If a magnetic catch on a door is broken.

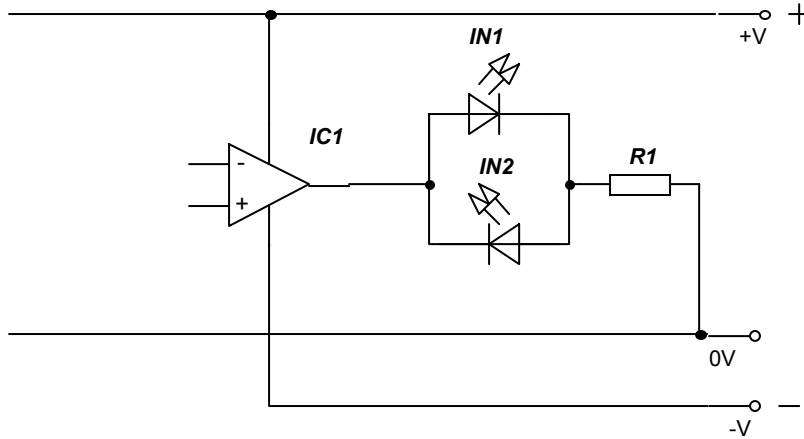
Using 2 input logic gates only draw the logic circuit below.

22. Connect the two batteries so as to produce a split rail power supply.



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23. The circuit below shows an Op amp used as a comparator



- i) Connect 2 resistors so as to fix the voltage at the inverting input.
- ii) Connect a thermistor and variable resistor so as to be able to adjust the voltage at the non inverting input.

24) A switch is required to turn the power supply on or off. A DPDT toggle switch has been chosen. What does DPDT stand for.

D _____ P _____ D _____ T _____

25)

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26. You have been asked to design a case for a games timer. Using notes and sketches show the following:

- a) How the timer is activated.
- b) The type of output and where it is located.
- c) How the battery is fixed into the case.
- d) How different time intervals are obtained.

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27. Using notes and sketches show how the case you designed in the previous question could be manufactured in a school workshop.

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28. You have been asked to write a simple program for a PIC to operate 4 lights in a flashing light sequence using the commands High, Low, Wait, Out, GoTo

Sequence	Your program
Red (output 1)	
1 second	
Blue (output 2)	
1 second	
Green (output 3)	
1 second	
Amber (output 4)	
1 second	
All lights on	
1 second	
All lights off	
1 second	
Start sequence again	

29. Portable music systems such as the Walkman, Discman and mp3 players are popular electronic products.

i) Name an advantage of these products under the following:

For the consumer _____

For the manufacturer _____

ii) Name a disadvantage

For the consumer _____

For Society _____

For Manufacturers _____

iii) List two possible future developments in portable music products

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30. Why is there pressure on manufacturers of electronic products to recycle products at the end of their life

31. Name a safety precaution when using a soldering iron _____

32. Name a safety precaution when drilling a PCB _____

33. Name a quality check you would carry out when drilling a PCB _____

34. Name a safety precaution when using PCB chemicals _____

35. You have been asked to design a plant watering system for a greenhouse. Using only two input Logic gates design a circuit that meets the following

- i) when it is dark
- ii) when the plants are dry
- iii) an override switch is used.

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36. Describe one advantage of computers for people _____

37. Describe one advantage of computers for society _____

38. Describe one disadvantage of computers for people _____

39. Describe one disadvantage of computers for society _____

40. What is a conductor _____

41. What is an insulator _____

42. Name a suitable material for making the course for a steady hand game _____

43. Why have you chosen this material _____

44. Name a suitable material for manufacturing the handle for a steady hand game _____

45. Why have you chosen this material _____

46. When connecting a battery snap to a PCB the red wire is the _____
connection. The black wire is the _____ connection.

47. What is the sponge on a soldering iron stand used for _____

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48. Describe how you would make a solder joint _____

49. Design a case for an electronic dice. Using notes and sketches show the following:

- a) The type of output
- b) How the dice is activated.
- c) How the battery is fixed into the case

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50. Using the table below calculate the value of the following resistors

Colour	1 st Band	2 nd Band	3 rd Band
Black	0	0	-
Brown	1	1	0
Red	2	2	00
Orange	3	3	000
Yellow	4	4	0000
Green	5	5	00000
Blue	6	6	000000
Violet	7	7	0000000
Grey	8	8	
White	9	9	

i) Brown Black Orange Gold _____

ii) Yellow Violet Red Gold _____

iii) Brown Black Black Gold _____

51. Resistors are manufactured in a range of preferred values. The E12 range is shown below. Choose the nearest resistor available to the value given in the question

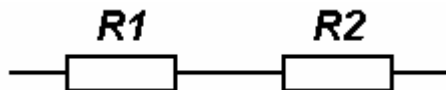
E12 range 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82 and their multiples.

i) 300R _____

ii) 2K5 _____

iii) 95R _____

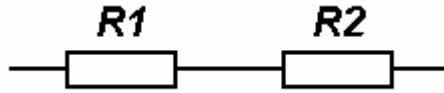
52.



Look at the diagram above. The two resistors are said to be connected in _____

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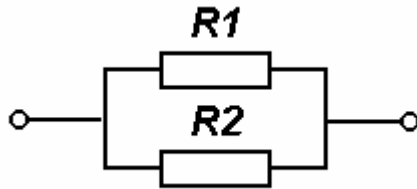
53. Given that the formula to calculate the total resistance is $R_{\text{total}} = R_1 + R_2$



If the total resistance is 20K and R2 is 10K find the value for R1

54. In the circuit below calculate the total resistance given that

$$\frac{1}{R_{\text{total}}} = \frac{1}{R_1} + \frac{1}{R_2}$$



i) R1 is 8R and R2 is 8R what is the total resistance

ii) R1 is 8R and R2 is 4R what is the total resistance

55. Give two advantages of using PIC's

i) _____

ii) _____

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56. Write a simple program to control the sequence of a traffic light

Light sequence	Program
Red	High 0

57. Using the formula $V_{out} = V_s \times R2 / (R1 + R2)$ Find V_{out} when V_s is 9V and $R1$ is 1K and $R2$ is 10K

