Name	Index No	newsspot.co.ke
1020/102	Claudidatata Sian	

1920/103 BASIC ELECTRONICS November 2015 Time: 3 hours

Candidate's	Signature	
Date		



THE KENYA NATIONAL EXAMINATIONS COUNCIL

CRAFT CERTIFICATE IN INFORMATION STUDIES

BASIC ELECTRONICS

3 hours

INSTRUCTIONS TO CANDIDATES

Write your name and index number in the spaces provided above.

Sign and write the date of examination in the spaces provided above.

Answer All questions in section A and any FOUR in section B.

Candidates should answer the questions in English.

For Examiner's Use Only

Section	Question	Maximum score	Candidate's score
A	1 - 10	40	
	11	15	
	12	15	
В	13	15	
	14	15	
	15	15	
		Total score	

This paper consists of 12 printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

Turn over

SECTION A (40 marks)

Answer ALL the questions in this section in the spaces provided.

the aid of a sketch, outline variable capacitor symbols.	(4 marks
in two disadvantages of BCD in comparison to binary num	ber system. (4 marks)
	number systems: (2 marks
mine the hexadecimal equivalent for each of the following 5 7 2 ₈ ;	
	(2 mai
	the aid of a sketch, outline variable capacitor symbols. in two disadvantages of BCD in comparison to binary num mine the hexadecimal equivalent for each of the following 5 7 28;

5.	Calculate each of the	following octal	arithmetic
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(i) 453 + 444;

(2 marks)

(ii) 765 - 301.

(2 marks)

6. A conductor wire of length 24 m has a resistivity of 8 x $10^{-4} \Omega$ m and cross sectional area of 1.6 x 10^{-2} m². Determine the:

(i) resistance of the wire in Ω ;

(2 marks)

(ii) conductivity of the wire.

(2 marks)

7. Explain two standard sign values for packed BCD used in computers.

(4 marks)

Using one's complement, determine 1111 1001 ₂ – 1110 1000 ₂ .	newsspot.co.ke (4 ma
•	
Bipolar transistors have distinct regions of operation. Outline four of junction biases.	of these regions defined b
Draw a truth table for an exclusive OR (XOR) gate.	(4 mark

SECTION B (60 marks)

Answer any FOUR questions in this section in the spaces provided.

1.	(a)	(i)	Explain two disadvantages of <i>flash memory</i> as used in computers. (4 marks)
		(ii)	Differentiate between asynchronous and synchronous as a character of Static RAM. (4 marks
	(b)	(i)	Determine the BCD equivalent of 1100 1111 1010 1001 ₂ . (3 marks)
		(ii)	A potential difference of 10 V is connected to a uniform resistance wire of lengt 0.4 m and cross sectional area of $16 \times 10^{-8} \text{ m}^2$ with resistivity of $3.2 \times 10^{-6} \Omega \text{ m}$. Determine of the current flowing through the wire. (4 marks

5

(a)	(i)	Outline three components that should be included in a DC ci	rcuit. (3 m
			<u></u>
			··-
	(ii)	Explain two functions of the neutron in an atom.	(4 ma
	(11)	DAPIGNIC TWO TONOGONS OF the Mountain and an area.	,
•••			
	<u> · · · · · · · · · · · · · · · · · ·</u>		
			+
		- Halamel	
		nateletine	
(b)	(i)	Using BCD, determine 342 + 213, giving the answer in Exce	ess-3 code.
(0)	(1)	Osing DOD, determine 5 12 × 213, g. ving and answer and	(3 ma
			-
_		A MARKET	-,-
			
			<u>, </u>
			
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(ii) Figure 1 shows an arrangement of logical gates. Construct a truth table showing the outputs R, S and T. (5 marks)

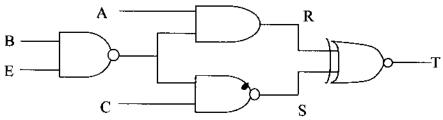
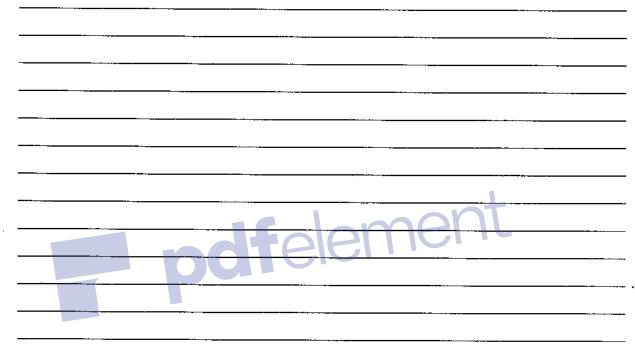
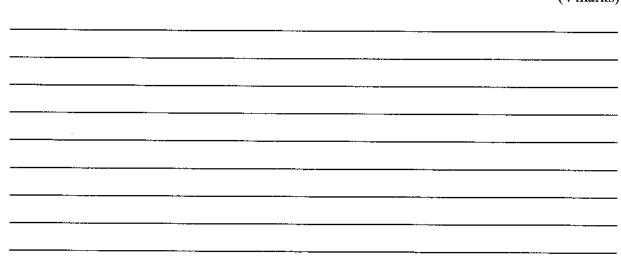


Figure 1



13. (a) (i) With the aid of sketches, outline **four** waveform shapes used in signals. (4 marks)



	(11)	A cui	resistor R (Ω)	(2 marks)
			•	
		H.	power in R in W (microwatts)	(3 marks)
— b)			h of the following binary arithmetic operations giving your answivalent:	wer in
	(i)	1001	0000+ 0100 1101; Selement	(3 marks)
_				
	(ii)	1111	0100 1100 0001.	(3 marks)
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		• ————————————————————————————————————	
	(ii)	Differentiate between <i>N-type</i> and <i>P-type</i> semiconductor materials.	(4 ma
	····		
(b)	(i)	Using laws of Boolean algebra, evaluate. $\overline{ABC} + \overline{ABC} + AB\overline{C} + ABC$	(5 m
		parelerie	

(ii) Figure 2 shows a simple electric circuit with four resistors of resistance R $_1$ (8 R $_2$ (6 Ω), R $_3$ (4 Ω), and R $_4$ (8 Ω) and voltage of 80 V. Determine the supply current I $_1$. (4 marks)

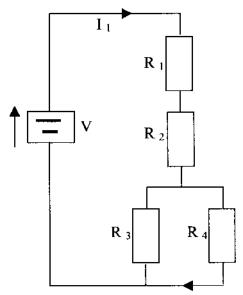


Figure 2



(a) (i) Outline three uses of extrinsic semiconductors. (3 marks)

15.

	(ii)	Using the K-map, simplify the function $\sum m$ (0, 2, 8, 10). (5 m)
		•
(b)	(i)	Improper management of memory is a common cause of bugs. Outline three
		such types of bugs. (3 marks
		
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		is langent
		- ATEIRITE
	(ii)	Lights in a room are controlled by three windows M, N and O. The light enters
	(11)	whenever windows M, N and O are in different positions. When M and O are in
		same positions, light enters on condition that window N is high.
		Draw a truth table to represent the information. (4 marks
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