

EEP Exam

by Oliver Overton

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Olly Overton Electronics exam OME course

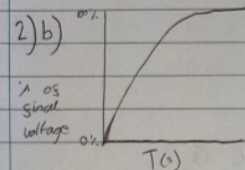
1)a) $10\text{ms} \times 4 = 40\text{ms}$

1)b) 2V 10ms $f = 1/t = 1/0.04 = 25\text{Hz}$

1)c) $V_{PK} = 4 \times 2 = 8\text{V}$

1)d) $8 \times 0.7071 = 8\sqrt{2} \times 0.7071 = 2.83\text{V}$

2)a) $V_C = V_S(1 - e^{-t/\tau})$ $10 \times (1 - e^{-4/(100 \times 10^{-6})})$
 $T = 2 \times 10^{-3}$ $10 \times (1 - e^{-4/2 \times 10^{-3}}) = 10\text{V}$



2)c) $E = \frac{1}{2} CV^2$
 $E = 0.5 \times (20 \times 10^{-6}) \times V_C =$
 $E = 0.5 \times (20 \times 10^{-6}) \times 10 = 1 \times 10^{-4}\text{J}$

2)d) $T = RC = 100 \times (20 \times 10^{-6}) = 2 \times 10^{-3}$
 $5 \times 10^{-6} = 10(1 - e^{-t/(2 \times 10^{-3})})$ ~~0.25~~
 $0.25 \times 10^{-3} = 0.5 \times 100 \times V$
 $5.44 \times 10^{-3}\text{s}$

3) AND, OR, NOT, NAND, NOR, XNOR, XOR

NAND = $\overline{A \cdot B}$

NOR = $\overline{A + B}$

XOR = $(A \cdot \overline{B}) + (\overline{A} \cdot B)$

XNOR = $\overline{(A \cdot B) + (\overline{A} \cdot B)}$

AND = $A \cdot B$

OR = $A + B$

NOT = $\overline{A}$

AND

A	B	Q
0	0	0
0	1	0
1	0	0
1	1	1

OR

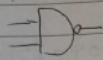
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	1

NOT

A	Q
0	1
1	0

3) CONTINUED

NAND



A	B	Q
0	0	1
0	1	1
1	0	1
1	1	0

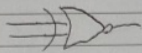
NOR



A	B	Q
0	0	1
0	1	0
1	0	0
1	1	0

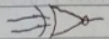
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XOR



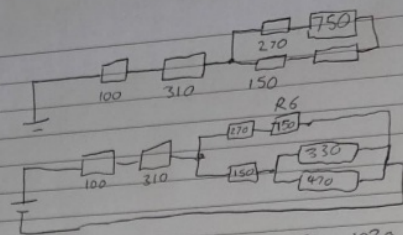
A	B	Q
0	0	0
0	1	1
1	0	1
1	1	0

XNOR



A	B	Q
0	0	1
0	1	0
1	0	0
1	1	1

Q4)



a) $100 + 310 = 410 \Omega$ $270 + 750 = 1020$

$\frac{1}{330} + \frac{1}{470} = \frac{1}{193.88 \Omega}$ $193.88 \Omega + 150 = 343.88$

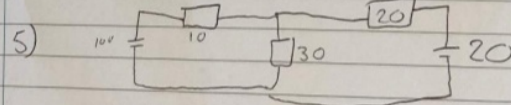
$\frac{1}{1020} + \frac{1}{343.88} = \frac{1}{257.18 \Omega}$ $257.18 \Omega + 410 = 667.18 \Omega$

4)b) $V = IR$
 $15 = I \times 667.18$
 $\frac{15}{667.18} = 0.022 A$

4)c) $0.022 \times 410 = 9.02$ $0.022 \times 343.88 = 7.587$
 $10.4 - 4.8 = 5.6 A$

4)d) $P = IV$
 $P = 0.022 \times 15 = 0.33 W$

4)e) $P = I^2 R$ $0.022^2 = (4.84 \times 10^{-4}) \times 470 = 0.23 W$



$10 = I \times 7.5$

$1.3 A$

$20 = I \times R$

$20 = I \times 12$

1.6

$R = \frac{1}{\frac{1}{30} + \frac{1}{20}} = 12$

$2.96 A$

EEP Exam

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

Instructor

48/100

PAGE 1



Comment 1

Total marks 24

Marks available 50

$24/50 \times 100 = 48\%$



Comment 2

Question 1

a) 1 Mark

b) 1 Mark

c) 1 Mark

d) 2 Marks

Q1 total 5 Marks



Comment 3

Question 2

a) 1 Mark - error in time constant

b) 2 Marks

c) 1 Mark - V not squared

d) 1 Mark

Q2 total 5 Marks

PAGE 2



Comment 4

Question 3 = 6 Marks

Incorrect boolean equations for xor and xnor. Should be circle plus for xor and circle plus with bar for xnor

PAGE 3



Comment 5

Question 4

a) 4 Marks

b) 2 Marks

c) 0 Marks - incorrect current used

d) 2 Marks

e) 0 Marks - incorrect current used

f) 0 Marks

Q4 total 8 Marks



Comment 6

Question 5 - 0 Marks