bcc	title	prefix/class-number.revision
	Technician Examination	TE/A-7

checked	authors	approval date	revision date
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approved		distribution	pages
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ABSTRACT and CONTENTS

This examination will be given to all applicants for the position of Technician and will be used as part of the evaluation of their qualifications for the job.

Included are:

bcc
TE/A-7
page 1

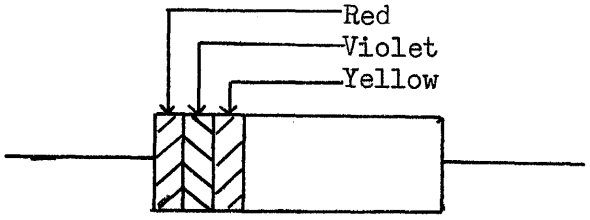
Name_____

Date_____

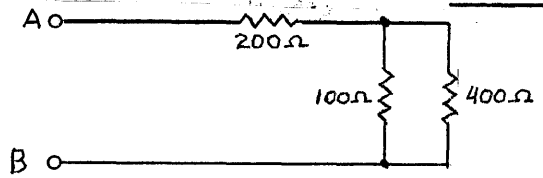
BERKELEY COMPUTER CORPORATION

TECHNICIAN EXAMINATION

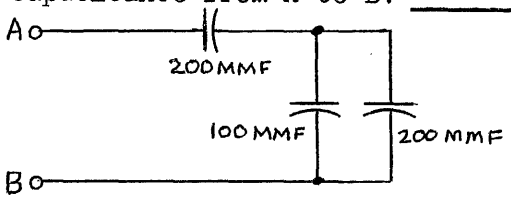
1. What is the value of the resistor color coded below? _____



2. What is the resistance from A to B? _____



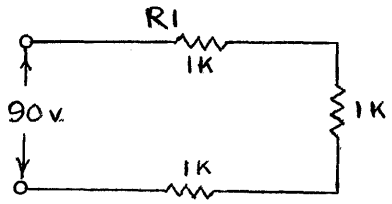
3. What is the capacitance from A to B? _____



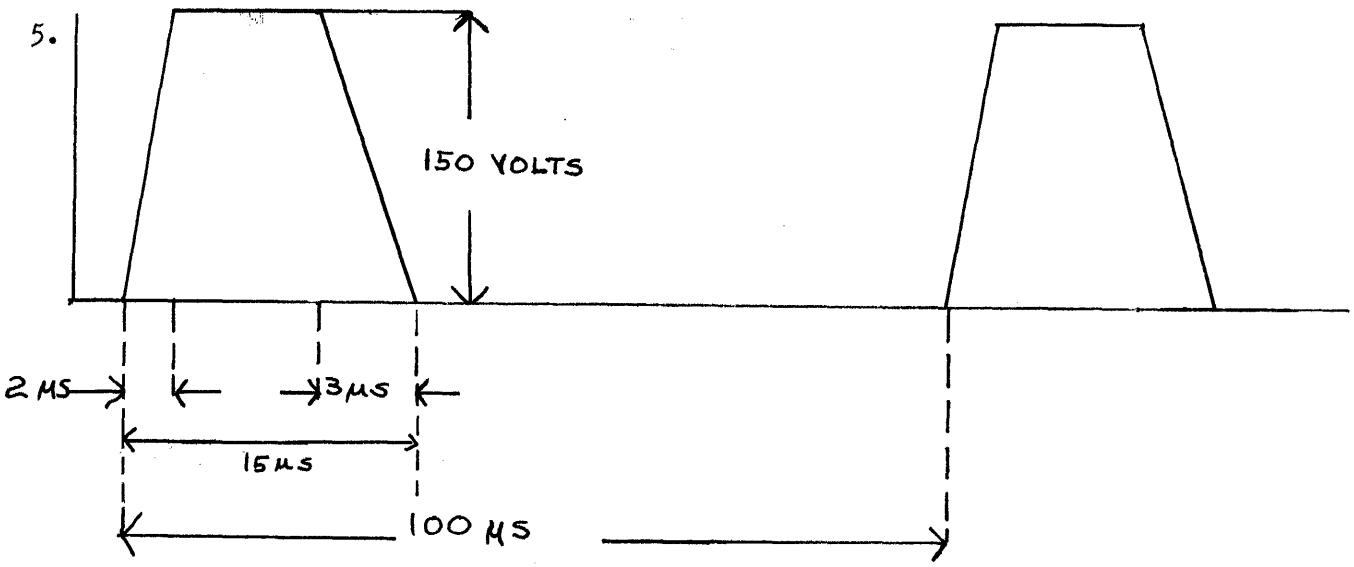
4. a) What current flows in the circuit below?_____

(1) b) What power is dissipated in R1? _____

c) What wattage rating would you select for R1? _____



5.



Referring to the above illustration, what is:

a) pulse height? _____

b) rise time? _____

c) fall time? _____

d) pulse duration? _____

e) pulse repetition frequency? _____

6. What is 33_{10} in binary? _____

7. What is 33_{10} in octal? _____

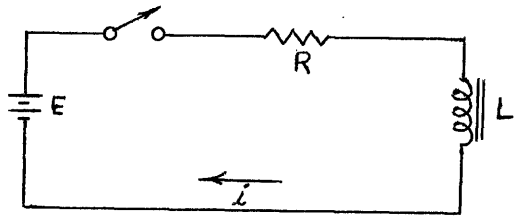
8. Show a combinatorial circuit for the following equation using only three NAND gates. $(A \cdot B) + (C \cdot D)$

9. Which has a larger diameter, a 6-32 screw or an 8-32 screw? _____

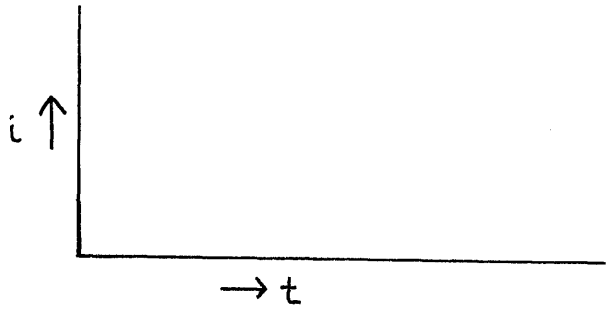
10. What does the "32" in 8-32 (as applied to screws) mean? _____

_____

11. In the diagram below, the switch is closed at t=0.



a) Sketch the shape of the current

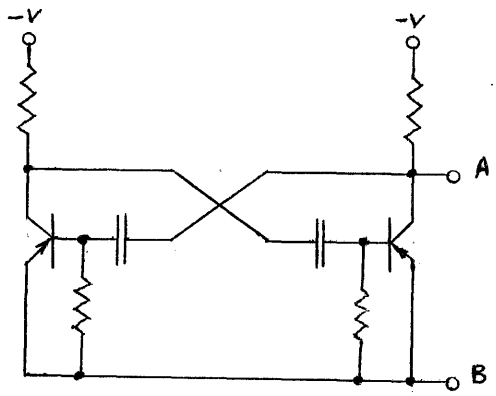


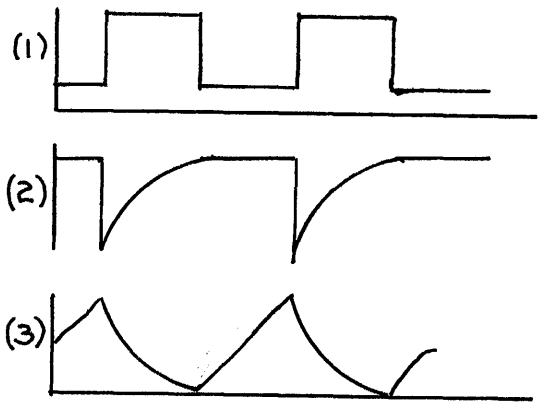
If E = 9V
R = 30
L = 5H

b) What is the value of the current i at t = 0? _____

c) What is the value of the current i at t = ∞ ? _____

12. Is the voltage from A to B represented by waveform 1,2 or 3? _____





13. If $4x + 6y = 100$ and $2x + 5y = 74$, what are the values of x and y?

x = _____

y = _____

14. In a four-wire core memory, what are the 4 wires used for?

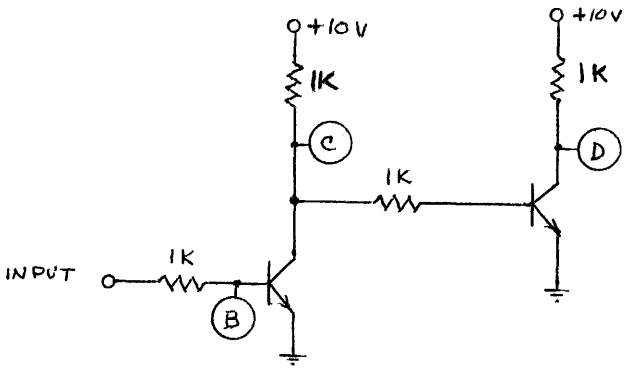
a) _____

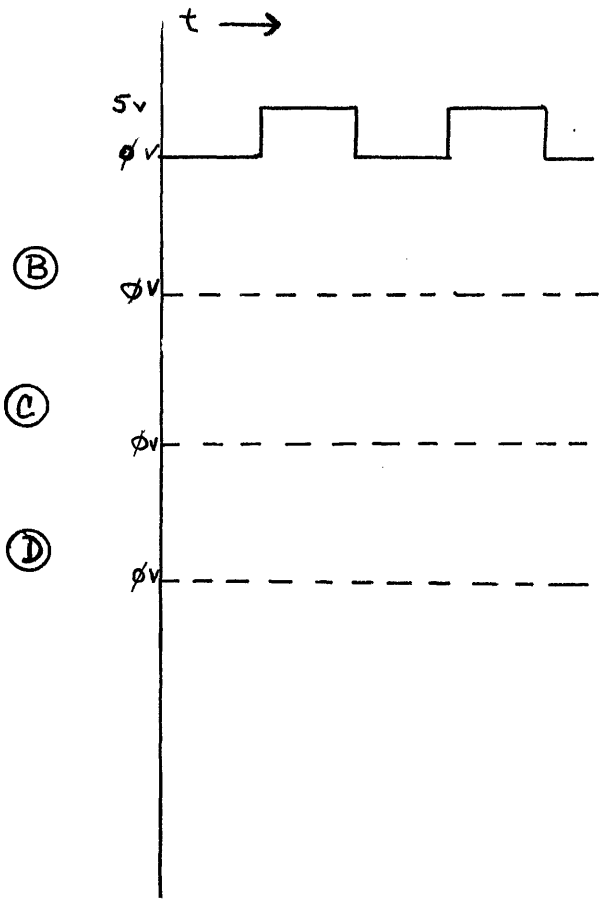
b) _____

c) _____

d) _____

15. The transistors have $\beta = \infty$. Sketch the voltages at Ⓑ, Ⓒ, Ⓓ for the input shown. Show all voltages.





TECHNICIAN EXAMINATION

ANSWERS

(1) 1. 270,000 Ω or 270K Ω

(1) 2. 280 Ω

(1) 3. 120 μμfd (120 pfd)

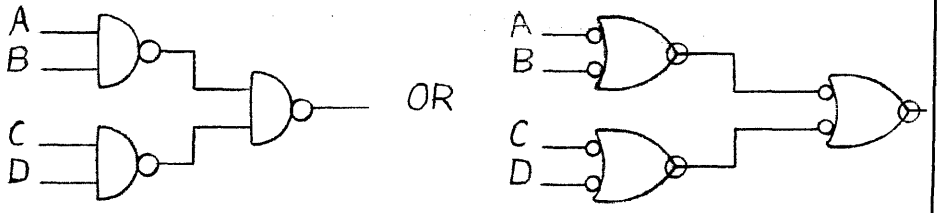
(3) 4. a) 30 ma or .03a
b) 0.9 watts
c) 2 watts (100% safety)
(1 watt also correct)

(5) 5. a) 150V
b) 2μsec
c) 3μsec
d) 15μsec
e) $f = \frac{1}{T} = \frac{1}{100 \times 10^{-6}} = \frac{1}{10^2 \cdot 10^{-6}} = \frac{1}{10^{-4}} = 10^4$ or 10 kc/sec

(1) 6. 100001

(1) 7. 41

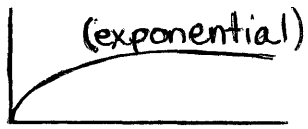
(3) 8.



(1) 9. 8-32

(1) 10. 32 threads/inch

(3) 11. a)



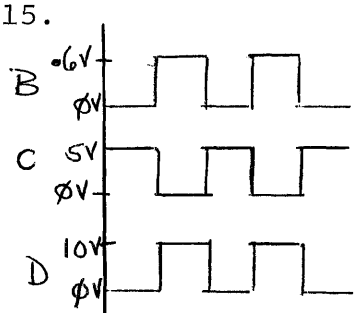
b) Ø
c) .3 amps

(2) 12. 1

(2) 13. x = 7, y = 12

(4) 14. X drive, Y drive, sense, inhibit

(6) 15.



1 point for each correct wave shape
1 point for each correct voltage

(B) .01-1 v
(C) can have base from 0-.5
(D) can have base from 0-.5

TOTAL = (35) Points

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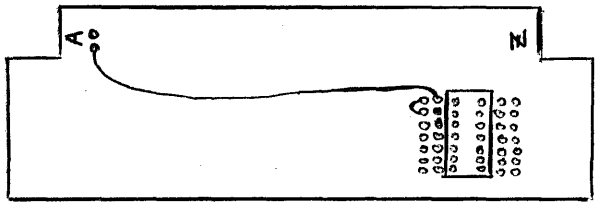
TECHNICIANS PRACTICAL EXAMINATION

1. Demonstrate Ability to Solder

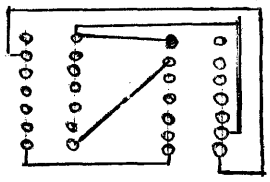
TEST: solder two wires
a) from pin A of card to pin 1 of socket furthest from pin A

b) from pin 1 of that socket to pin 2.



2. Demonstrate Ability to Wirewrap

TEST: wire wrap the 2 adjacent sockets as shown below:



3. Demonstrate Ability to Use Oscilloscope

TEST: set up 1 cycle of calibrator on scope with positive pulse first and full scale deflection.

TECHNICIAN EXAMINATION

PRACTICAL SETUP

1. Demonstrate Ability to Solder

Setup:
- 1 small Kluge board
- 1 pair wire strippers (heat or mechanical as desired)
- 1 soldering iron
- 28 gauge wire (Teflon single strand)
- 1 socket
- 1 circuit board holder

2. Demonstrate Ability to Wire Wrap

Setup:
- Teflon 26 or 28 gauge wire
- 1 wire wrap tool
- 1 pair wire strippers (heat or mechanical as desired)
- 1 pair needle nose pliers
- 1 small Kluge card with 2 W/W sockets in place
- 1 circuit board holder

3. Demonstrate Ability to Use Oscilloscope

Setup:
- 547 Tektronix scope on at least 1 minute
- all knobs to ccw position
- all vertical switches to their bottom position
- 2 horizontal switches near left bottom of scope to Gnd

TECHNICIAN EXAMINATION

PRACTICAL EXAMINATION CHECKLIST

1. Demonstrate Ability to Solder

a) does the applicant consider himself experienced at soldering?_____

b) how many solder joints are dull?_____

c) is the loop between pin 1 and pin 2 small?_____ (maximum 1/16" diameter)

d) how many wires do not come through the solder?_____ how many are not clipped very close to the solder?____

e) is there a minimal amount of wire showing between the end of the insulation and where the wire goes through the board?_____ (maximum 1/16")

2. Demonstrate Ability to Wire Wrap

a) does the applicant consider himself experienced at wire wrapping?_____

b) does the board have a neat appearance (are the wires the right length, are they flat against the board, etc.)?_____

c) are the wires right on top of each other on the 2-wire pin?_____

Of the 10 connections,

d) how many have fewer than 6 or more than 10 wraps around the pin?_____

e) how many gaps are there between wires?_____

f) how many overlaps are there?_____

g) how many ends are sticking out from the pin?_____

TECHNICIAN EXAMINATION

PRACTICAL EXAMINATION CHECKLIST CONTINUED

h) how many pins are bent?_____

i) how many do not have a wrap of insulation around the pin?_____

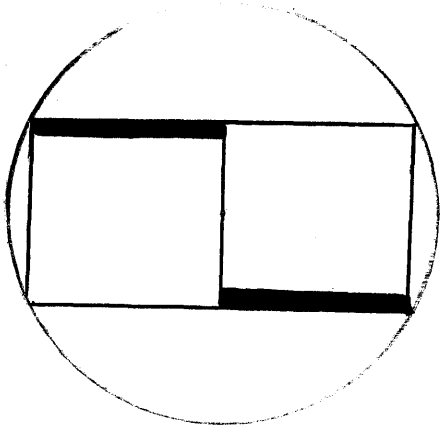
3. Demonstrate Ability to Use Oscilloscope

a) does the applicant consider himself experienced in the use of the Oscilloscope?_____
(This model?_____)(Another model?_____)

b) how long does it take to set it up?_____minutes.
(very good: 2 minutes maximum: 7 1/2 minutes)

c) is trace sharp, well defined and without jitter?_____

d) does scope picture look as below?_____



TECHNICIAN EXAMINATION

INSTRUCTIONS FOR ADMINISTERING

Written Examination

1. Give the applicant the examination paper and instruct him to put his answers in the space provided.

2. There is a time limit of half an hour.

3. Slash incorrect answers and write in correct ones on test paper.

4. Write the score on the top of the first page (35 is a perfect score; the weight of each question is given in the left margin of the ANSWERS)

Practical Examination

1. Make sure that the setup is complete, as listed in the TECHNICIAN EXAMINATION - PRACTICAL SETUP (page 7).

2. Before the applicant begins the practical examination, ask him if he is experienced in the three areas being tested: soldering, wire wrapping and use of the oscilloscope. If he says that he has never had any experience in an area, do not attempt to administer that part of the examination.

3. There is no set time limit for the practical examination, except for the use of the oscilloscope. Time limit is approximately 7 1/2 minutes for that.

4. Enter results of practical examination on TECHNICIAN EXAMINATION - PRACTICAL EXAMINATION CHECK-LIST (page 8). In most places, the score will simply be a checkmark. If the operation you are scoring does not come up to par, leave the scoring space blank. In the case of wire wrapping, the scores for letters c - i will be numbers.

Practical Examination continued

5. Do not allow the applicant to read the PRACTICAL SETUP or the PRACTICAL EXAMINATION CHECKLIST.

6. Return the graded WRITTEN EXAMINATION and filled in PRACTICAL EXAMINATION CHECKLIST to the person who is interviewing the applicant.

7. Clean up the work area used by the applicant.