Pacific Gas and Electric Company
WE DELIVER ENERGY.

LETTER AGREEMENT NO. 02-21-PGE

IBEW

PACIFIC GAS AND ELECTRIC COMPANY
INDUSTRIAL RELATIONS DEPARTMENT
2850 SHADELANDS DRIVE, SUITE 100
WALNUT CREEK, CALIFORNIA 94598
(925) 974-4104

INTERNATIONAL BROTHERHOOD OF
ELECTRICAL WORKERS, AFL-CIO
LOCAL UNION 1245, I.B.E.W.
P.O. BOX 4790
WALNUT CREEK, CALIFORNIA 94596
925-933-6060

STEPHEN A. RAYBURN
DIRECTOR AND CHIEF NEGOTIATOR

PERRY ZIMMERMAN
BUSINESS MANAGER

May 16, 2002

Local Union No. 1245
International Brotherhood of
Electrical Workers, AFL-CIO
P. O. Box 4790
Walnut Creek, CA 94598

Attention: Mr. Perry Zimmerman, Business Manager

Dear Mr. Zimmerman:

Company proposes to replace the existing Apprentice Metering Electronics Technician (AMET) entrance exam with the more up-to-date Apprentice Metering Systems Technician (AMST) entrance exam. The current exam is no longer meeting the needs of the department and has negatively impacted the Company's ability to fill vacancies.

Upon reviewing the entrance exam for the AMET, it was concluded that the AMST entrance exam agreed to in Apprentice Committee Case 97-14 is more appropriate in evaluating an individual's potential to progress through the Metering Electronics Technician apprenticeship. The study guide has been updated to reflect that it is applicable to both the AMST and AMET.

As a result of this proposed change and recent experience with the existing AMET exam, the Company proposes that AMET test results for candidates who failed to qualify during the past six months be purged.

This proposal has been reviewed with Assistant Business Manager Jim McCauley and Technical Crew Lead Renee Cederquist.

If you are in accord with the foregoing and agree thereto, please so indicate in the space provided below and return one executed copy of this letter to the Company.

Very truly yours,

PACIFIC GAS & ELECTRIC COMPANY

By: _____
Stephen A. Rayburn
Director and Chief Negotiator

The Union is in accord with the foregoing and agrees thereto as of the date hereof.

LOCAL UNION NO. 1245, INTERNATIONAL
BROTHERHOOD OF ELECTRICAL WORKERS, AFL-CIO

June 11, ,2002 By: _____
Perry Zimmerman
Business Manager

STUDY GUIDE FOR PACIFIC GAS AND ELECTRIC COMPANY APPRENTICE METERING SYSTEMS TECHNICIAN AND APPRENTICE METERING ELECTRONICS TECHNICIAN QUALIFYING TEST

Prerequisites

Although there are no education requirements, it is highly recommended that all candidates be thoroughly familiar with:

(1) Basic Electricity (AC and DC) and Basic Electronics
(2) Mathematics (Algebra and Basic Trigonometry)

Candidates are strongly encouraged to gain such education through accredited programs in vocational schools and community colleges.

About the Test

There are 80 questions. There are two parts to this test. 1) Eighteen (18) math questions and 2) 62 mixed questions on basic electricity and electronics.

Candidates are allowed 1.5 hours to complete the math portion without the aid of a calculator and 2.5 or more hours (depending the time used for the math portion) for basic electricity and electronics portion with calculators. The math portion will be administered first. Once the test takers turn in the math portion, they will receive the second portion, basic electricity and electronics. Test takers will not be allowed to return to the math portion once it has been turned in. The total amount of time allowed for the test is 4 hours.

Seventy (70%) percent score required to qualify.

This test allows you to demonstrate your knowledge and understanding of the fundamentals of basic electricity, electronics and mathematics as well as your preparedness for advanced technical training.

Taking the Qualifying Test

Candidates for the program have two options:

(1) Bid Apprentice Metering Systems Technician or Apprentice Metering Electronics Technician jobs: When you become the top bidder for the position, you will be required to take the qualifying test. If you successfully pass the test, the position would be awarded to you.

(2) Pre-qualify yourself for the program: When ready, request to take the test through your supervisor, who will make all necessary arrangements with the Human Resources Department. Upon passing of the test, you would be awarded an Apprentice Meter Systems Technician or Apprentice Metering Electronics job when you become the top bidder.

Test Administration

All tests are handled and graded by the Learning Services or Human Resources Department. A letter will be forwarded to you within a few days after taking the test showing the results. If unsuccessful, the letter will contain suggested areas for further study. This is to increase your chance of qualifying in retaking the test.

Review of this exam will be done in accordance with Title 205.11 of the Contract.

Retaking the Qualifying Test

After the first attempt, you must wait three months, or thereafter, following the date of the first testing.

After the second attempt, you must wait six months, or thereafter, following the date of the second testing.

After the third attempt, by special request only, six months, or thereafter, following the date of the third testing provided that the employee is able to show satisfactory evidence that the employee has prepared himself or herself to pass the test.

References

These references are listed as additional study material sources for becoming proficient in basic electricity and mathematics to qualify you for the Apprentice Metering Systems Technician or Apprentice Metering Electronics Technician program. The reference materials listed here are provided to assist you in preparing for this qualifying test, but they are not substitutes for extensive formal education and training. Scholastic Aptitude Test (Study Guide for math),

Many other excellent basic electricity and mathematics reference books are available from libraries, bookstores, and college bookstores.

Materials Covered in the Test

I. **AC-DC**- Theory (Circuit Analysis, Quantitative relationships, calculations, recognition)

DC circuits
Single Phase AC circuits
Series and Parallel RCL circuits, Transformer Circuit Analysis (Inductors, Capacitors, Resistors, Diodes, SCR's)

II. Mathematics (See SAT - Study Guide)

Sample Test Questions:

These sample test questions are included to give you an idea of the kind and types of questions you can expect to find on the qualifying test. These questions do not appear in the actual test, but the nature and difficulty are representative of the ones on the qualifying test. Try completing these questions as a self-test to evaluate your knowledge and preparedness for qualifying for the Apprentice Metering Systems Technician or Apprentice Metering Electronics Technician Program. (Answers and solutions to questions are attached.)

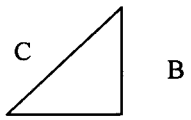
Correct Answers

0-10 A long way to go.

11-14 Back to the books.

15-20 You should be able to successfully qualify for the program

1. For the triangle shown, if A = 8 and B = 6, find C?.



(a) 9
(b) 10
(c) 14
(d) 15
(e) 16

2. A car averages 15 miles per gallon of gas in city driving and 20 miles per gallon in highway driving. At these rates, how many gallons of gas will the car use on a 600 mile trip if 4/5 of the trip is highway driving and the rest is city driving?

(a) 24
(b) 32
(c) 40
(d) 44
(e) 60

3. If $8(x - 1) - 4x = 16$, then x =

(a) 4
(b) 6
(c) 11
(d) 13
(e) 16

4. Which of the following is equal to $\frac{200 + n}{50}$

(a) $\frac{8 + n}{10}$
(b) $\frac{20 + n}{5}$
(c) 4n

(d) 4 + n

(e) $4 + \frac{n}{50}$

5. If $su^3t^4 > 0$, which of the following products must be positive?

(a) su
(b) st
(c) ut
(d) sut
(e) su^2

6. A 6-microfarad capacitor and a 4-microfarad capacitor are connected in parallel across a 50-v, 100-HZ source. Determine the:

(a) Total capacitance =

(b) Total reactance =

(c) Total current =

7. T F A potential difference between two points is called a power.

8. T F For a given weight and size, a capacitor stores more energy than a battery.

9. What is the resistance of a lamp which draws 250 milliamperes when connected to a 12.6 volt battery?

10. A toaster draws 10 amps from a 120 volt source, how much energy would it cost to operate the toaster in 2 hours, if energy cost 10 cents per Kwh?

11. The base unit of energy is the

(A) Ion
(B) Proton
(C) Joule
(D) Pound

12. A 30 ohms load is connected to the 6 volt secondary of a transformer with a 120 volt primary, what ohmic value does the load appear to be to the source?

13. T F Reducing the inductance in a series RL circuit causes the true power to increase.

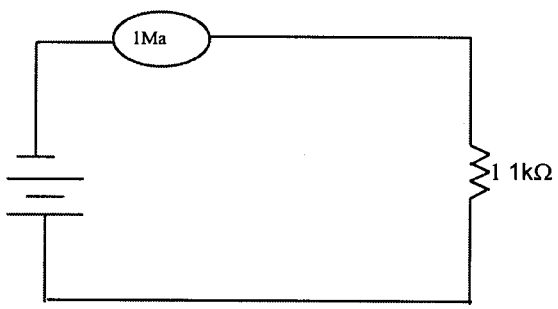
14. At resonance, the Power Factor of a circuit is _____.

15. Draw two capacitors in series.

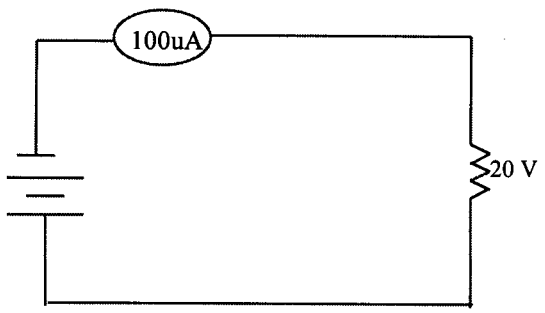
16. Three capacitors of 11 pf, 22 pf, and 33 pf are connected in series.
Find the total capacitance? _____

17. Find the reactance Xc for a 100 microfarad capacitor when the frequency is 60 H_Z ? _____.

18. Solve for Voltage. Ans. _____



19. Solve for Resistance Ans. _____



20. A current of 1 ampere splits between 10Ω and 20Ω resistors in parallel.
Find the current through each? $I_{10\Omega}$_____, $I_{20\Omega}$_____.

Answers to the Sample test questions

1. B

2. B

3. B

4. E

5. A

6. Total C = 10 μf, Total Reactance = 159.235 ohms, Total Current = .31446A.

7. F

8. F

9. 50.4 ohms

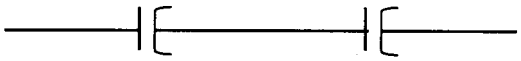
10. 24 cents

11. C

12. 12000 ohms

13. T

14. Unity or 100% P.F.

15 

16. 6 pf

17. 26.54 ohms

18. 1 volt

19. 200 Kohms

20. $I_{10\Omega}$ = .666 amps $I_{20\Omega}$= .333 amps.

Solutions to Mathematical Questions:

1. $C^2 = a^2 + b^2$

   $C = \sqrt{8^2 + 6^2}$

   $C = \sqrt{100}$

   $C = 10$

2. 4/5 x 600 miles = 480 miles of highway driving
   1/5 x 600 miles = 120 miles of city driving
   480/20 miles per gallon = 24 gallons highway driving
   120/15 miles per gallon = 8 gallons city driving
   Total gallons used is 24 + 8 = 32 gallons

3. $8(x-1) - 4x = 16$
   $8x - 8 - 4x - 16 = 0$
   $4x = 24$
   $x = 6$

4. $\frac{200}{50} + \frac{N}{50}$

   $4 + \frac{N}{50}$

5. If $su^3t^4 > 0$, which of the following products must be positive?

T can be + or – and T^4 would always be + so T is not part of the answer. Eliminate (B,C and D). E doesn't work because U could be -1 and S could be -1, then $SU^2 = -1(-1)^2 = -1$ but SU^3 would $-1\ (-1)^3 = +1$.

(a) SU

6. a) 6 microfarad + 4 microfarad = 10 microfarad

   b) $X_c = \frac{1}{2\Pi FC}$

   $= \frac{1}{2\ (\Pi)\ (100)\ (10 \times 10^{-6})}$

Total Reactance = 159.23 ohms, Total current = E/Z = 50v/159.23 = .31446 amps

7. F

8. F

9. $R = \frac{E}{I} = \frac{12.6}{.25} = 50.4$ ohms

10. Energy in Kwh = $\frac{P \times T}{1000}$

$\frac{120 \times 10 \times 2hrs}{1000}$ = 2.4 kwh x .10/kwh = 24 cents

11. C

12. $I_{sec} = E_{sec} \div R$ 6v ÷ 30 ohms = .2 amps

$R_{pri} = E_{pri} \div I_{pri}$ = 120v ÷.2/TR = 120v. ÷2 / 20= 120v ÷ .01 = 12000 ohms

13. T

14. Unity or 100% p.f.

15 

16. Total capacitance = $\dfrac{1}{\frac{1}{11pf} + \frac{1}{22pf} + \frac{1}{33pf}}$ = 6 pf

17. Total reactance = $\dfrac{1}{2 \Pi F C} = \dfrac{1}{2 (\Pi) (60) (100 \times 10^{-6})}$ = 26.54 ohms

18. E = I x R = .001 x 1000 = 1 volt

19. R = E ÷ I = 20 ÷ 100 x 10^{-6} = 200 kilo ohms

20. Req = $\dfrac{R_1 x\ R_2}{R_1 + R_2} = \dfrac{200}{30}$ = 6.6666 ohms

Et = It x Rt = 1a x 6.6666 ohms = 6.6666 v
$I_{10\Omega}$ = Et ÷ $R_{10\Omega}$ = 6.666v ÷ 10Ω = .6666 amps
$I_{20\Omega}$ = Et ÷ $R_{20\Omega}$ = 6.666v ÷ 20Ω = .3333 amps