Study Guide
for
Communications Technician Test

Test Number: 2983

Human Resources
Performance Assessment Services
Southern California Edison
An Edison International Company

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Introduction

The **2983 Communications Technician Test** is a job knowledge test designed to cover the major knowledge areas necessary to perform the job. This Guide contains strategies to use for taking tests and a study outline, which includes knowledge categories and study references.

Test Session

It is important that you follow the directions of the Test Administrator exactly. If you have any questions about the testing session, be sure to ask the Test Administrator before the testing begins. During testing, you may **NOT** leave the room, talk, smoke, eat, or drink. Since some tests take several hours, you should consider these factors before the test begins.

All cellular/mobile phones, pagers or other electronic equipment will NOT be allowed in the testing area.

All questions on this test are multiple-choice or hot spot questions. Multiple choice questions have four possible answers. Hot spot questions have a picture, and you must click the correct spot on the picture to answer the question. All knowledge tests will be taken on the computer. For more information on computer based testing, follow the link: www.edison.com/studyguides and click on Computer Based Testing Information.

The test has a three hour time limit. A scientific calculator will be provided for you to use during the test. The calculator provided during the test session will be one of these models:

- Casio fx-250HC,
- Texas Instruments TI-30XA,
- Texas Instruments TI-36X

You will NOT be able to bring or use your own calculator during testing.

You will receive a Test Comment form so that you can make comments about test questions. Write any comments you have and turn it in with your test when you are done.

Study Guide Feedback

At the end of this Guide you have been provided with a Study Guide Feedback page. If a procedure or policy has changed, making any part of this Guide incorrect, your feedback would be appreciated so that corrections can be made.

Test Taking Strategies

Introduction

The **2983 Communications Technician Test** contains multiple-choice questions and may also contain hot spot questions. The purpose of this section is to help you to identify some special features of a multiple-choice test and to suggest techniques for you to use when taking one.

Your emotional and physical state during the test may determine whether you are prepared to do your best. The following list provides common sense techniques you can use before the test begins.

Technique	Remarks
Be confident	- If you feel confident about passing the test, you may lose some of your anxiety. - Think of the test as a way of demonstrating how much you know, the skills you can apply, the problems you can solve, and your good judgment capabilities.
Be punctual	- Arrive early enough to feel relaxed and comfortable before the test begins.
Concentrate	- Try to block out all distractions and concentrate only on the test. You will not only finish faster but you will reduce your chances of making careless mistakes. - If possible, select a seat away from others who might be distracting. - If lighting in the room is poor, sit under a light fixture. - If the test room becomes noisy or there are other distractions or irregularities, mention them to the Test Administrator immediately.
*Budget your time*s	- Pace yourself carefully to ensure that you will have enough time to complete all items and review your answers.
Read critically	- Read all directions and questions carefully. - Even though the first or second answer choice looks good, be sure to read all the choices before selecting your answer.
Make educated guesses	- Make an educated guess if you do not know the answer or if you are unsure of it.

Changing answers	-	If you need to change an answer, be sure to erase your previous answer completely. On the computer, be sure that the new answer is selected instead of the old one.
Return to difficult questions	-	If particular questions seem difficult to understand, make a note of them, continue with the test and return to them later.
Double-check math calculations	-	Use scratch paper to double check your mathematical calculations.
Review	-	If time permits, review your answers.
	-	Do the questions you skipped previously.
	-	Make sure each answer bubble is completely filled in. Erase any stray marks on your answer sheet. When testing on the computer, make sure each multiple choice question has a green dot next to the correct answer.

Remember the techniques described in this section are only suggestions. You should follow the test taking methods that work best for you.

Job Knowledge Categories and Study References

Below are the major job knowledge areas (topics) covered on the **2983 Communications Technician Test** and the associated study references. Listed next to each knowledge category is the number of items on the exam that will measure that topic. You can use this information to guide your studying. Some exams also contain additional pretest items. Pretest items will appear just like all of the other items on your exam, but they will not affect your score. They are an essential part of ensuring the **2983 Communications Technician Test** remains relevant to successful performance of the job.

There are a total of 93 items on the **2983 Communications Technician Test** and the passing score is 71%. This score was determined during the test validation process.

A. Principles of Telecommunications (36 items)

Understanding of electronic & electrical theory including knowledge of: electrical circuitry and related diagrams and symbols; power source symbols; electric coils, switches, transistors, fuses, amplifiers, diodes, and batteries; AC/DC current; grounding, resistance, capacitance, and harmonics including all related formulas; and logic trees.

Understanding of communication principles including knowledge of: analog and digital signals; noise (including how to measure it); cycle frequencies; dispersion, duplexing, amplitude; harmonics; bandwidth, distortion, interference, modulation, and feedback; oscillation; decibels; clocking/sync systems; attenuation; data rates (e.g., DS0, DS1 and DS3, etc..) and interfaces; OSI layers; gate symbols; squelch circuits;

References for Principles of Telecommunications:

- ✓ Bates, Regis & Gregory, Donald. *Voice & Data Communications Handbook*. McGraw-Hill, 2007.
- ✓ Coll, Eric. *Telecom 101: Telecommunications for Non-engineers*. Teracom Training Institute Ltd, 2008
- ✓ Green, James H. *The Irwin Handbook of Telecommunications*. McGraw-Hill, 2005.
- ✓ Grob, Bernard. *Basic Electronics*. McGraw-Hill, 1997.
- ✓ Horak, Ray. *Telecommunications and Data Communications Handbook*. Wiley-Interscience, 2007.
- ✓ Newton, Harry. *Newton's Telecom Dictionary, 25th Edition: Telecommunications, networking, information technologies, the internet, wired, wireless, satellites, and fiber.* Flatiron Publishing, 2009.

B. Telecommunication Systems (43 items)

Understanding of Telecommunication systems and technologies including advanced knowledge of proper terminology, function, and operating principles for the following: telephone systems (e.g., VoIP, voice frequencies, PBX, ACD, BRI, side tones, hybrid transformers, etc…); microwave carrier systems (e.g., transmitters; wave signals, transmissions, receivers, etc…) ; fiber optic carrier systems (e.g., SONET, DWDM, BLSR, , trunking and links, UBSR, ROADM,

etc…); digital cross-connect systems; data switching systems; power protection relay communication circuits; digital systems (e.g., transmission rates, circuit types, Ethernet connections, RS-485)

References for Telecommunication Systems:

- ✓ Bates, Regis & Gregory, Donald. *Voice & Data Communications Handbook*. McGraw-Hill, 2007.
- ✓ Biswanath, Mukherjee. *Optical WDM Networks.* Springer, 2006
- ✓ Coll, Eric. *Telecom 101: Telecommunications for Non-engineers*. Teracom Training Institute Ltd, 2008
- ✓ Green, James H. *The Irwin Handbook of Telecommunications*. McGraw-Hill, 2005.
- ✓ Grob, Bernard*. Basic Electronics*. McGraw-Hill, 1997.
- ✓ Hagen, Jon. *Radio-Frequency Electronics: Circuits and Applications.* Cambridge University Press, 1996.
- ✓ Helvoort, Huub van. *SDH/SONET Explained in Functional Models: Modeling the Optical Transport Network.* Wiley, 2005.
- ✓ Horak, Ray. *Telecommunications and Data Communications Handbook*. Wiley-Interscience, 2007.
- ✓ Newton, Harry. *Newton's Telecom Dictionary, 25th Edition: Telecommunications, networking, information technologies, the internet, wired, wireless, satellites, and fiber.* Flatiron Publishing, 2009.
- ✓ Shrader, Robert. *Electronic Communication.* Career Education, 1990.
- ✓ Winch, Robert G. *Telecommunications Transmission Systems*. McGraw-Hill, 1998.

C. Cables, Wires, and Related Equipment/Tools (14 items)

Understanding of telecommunication cables, wires, electrical and electronic test instruments, meters, and tools including the following: oscillator, voltmeter, db meter, oscilloscope, volt-ohmmeter (VOM), frequency and deviation meter, transistor tester, signal generator, frequency counter, pulse generator, audio amplifier, spectrum analyzer, noise-power ratio test set, impedance bridge, continuity tester, transmission impairments meter (TIM), data rate testers, protocol analyzer, personal computer (PC), and PC interface, Ethernet cables, wire sequences, frequency bands, fiber optic cables, and color pairs for telecommunication cables.

References for Cables, Wires, and Related Equipment/Tools:

- ✓ Bates, Regis & Gregory, Donald. *Voice & Data Communications Handbook*. McGraw-Hill, 2007.
- ✓ Biswanath, Mukherjee. *Optical WDM Networks.* Springer, 2006
- ✓ Coll, Eric. *Telecom 101: Telecommunications for Non-engineers*. Teracom Training Institute Ltd, 2008
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- ✓ Shrader, Robert. *Electronic Communication.* Career Education, 1990.
- ✓ Winch, Robert G. *Telecommunications Transmission Systems*. McGraw-Hill, 1998.

Sample Questions

The following sample questions should give you some idea of the form the test will take.

1. **The SONET signal hierarchy is based on a basic "building block" frame called:**
    a. STS-1
    b. T1.
    c. DS1.
    d. DS3.

2. **Which of the following meters would most likely be used for monitoring audio levels?**
    a. Volt-ohm meter
    b. Volume-unit (VU) meter
    c. Digital volt meter
    d. Vacuum tube volt meter

3. **The four lowest layers of the 7-layered OSI (Open Systems Interconnect) model are:**
    a. Transport, Session, Presentation, Application.
    b. Physical, Network, Transport, Session.
    c. Physical, Data Link, Network, Transport.
    d. Physical, Data Link, Transport, Network.

4. **Converting from an analog to a digital signal for digital transmission is achieved by:**
    a. sampling the analog signal using Pulse Amplitude Modulation (PAM), and formatting the samples using Pulse Code Modulation (PCM).
    b. measuring the analog time differential and coding the difference using TDM.
    c. A to D conversion using frequency division multiplexing.
    d. A to D conversion using pulse position multiplexing.

Sample Question Answers

1. A
2. B
3. C
4. A

Study Guide Feedback

Please use this page to notify us of any changes in policies, procedures, or materials affecting this guide. Once completed, return to:

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Page	Comments