

**ETL – Telecommunication  
Systems**

**T128**

**Wednesday, 05/11/2014**

**8:30 - 11:30 AM**

**WORKFORCE DEVELOPMENT AUTHORITY**



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2014  
TECHNICAL AND PROFESSIONAL TRADES**

**EXAM TITLE: Telecommunication Systems**

**OPTION: Electronics and Telecommunication (ETL)**

**DURATION: 3hours**

**INSTRUCTIONS:**

The paper is composed of **two (2) main Parts** :

**Part A: Telephony and Antennas.**

**Section I.** compulsory questions. **(30marks)**

**Section II.** Answer any two **(2)** questions of your choice. **(20marks)**

**Part B: TV, Video, Emitter & Radio Techniques.**

**Section I.** compulsory questions. **(30marks)**

**Section II.** Answer any two **(2)** questions of your choice. **(20marks)**

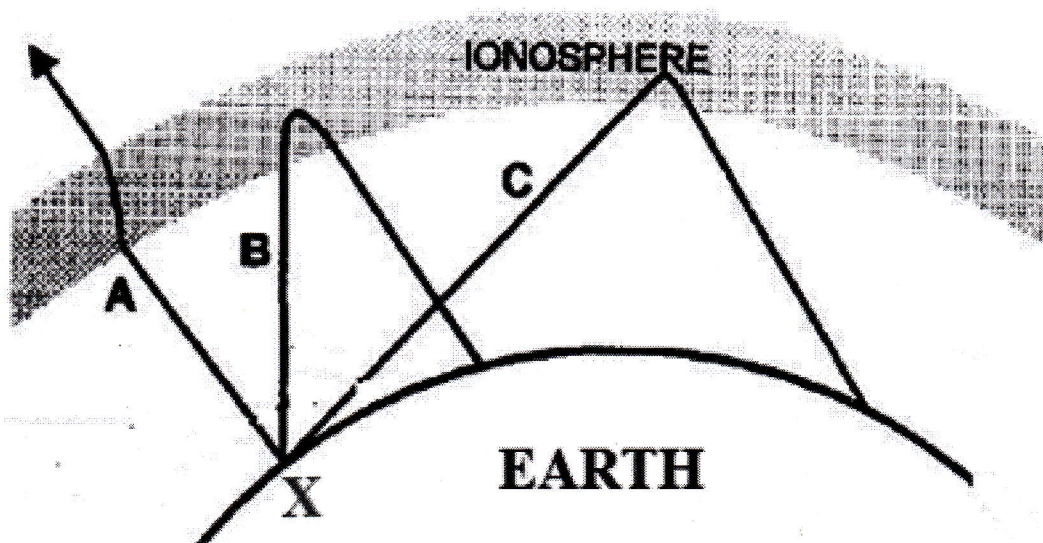
- Use two separate answer booklets as per each part stipulated here above.

**SECTION I. EIGHT (8) COMPULSORY QUESTIONS.**

01. Identify the types of transmission lines in antenna system. **3marks**
02. Find the far-field distance for an antenna with maximum dimension of 3.5meter and operating frequency of 900MHz. **3marks**
03. Identify four (4) types of antenna. **4marks**
04. How can you enhance communication parameters between emitter and receiver? **5marks**
05. When an RF signal is radiated from a vertical antenna, in which plane will be the H field, E field and the receiver antenna? **3marks**
06. Analyze the structure of a telephone number to make an international call. **4marks**
07. Identify the main parts of a telecommunication system. **4marks**
08. Differentiate half-duplex, and full duplex. **4marks**

**SECTION II. ATTEMPT ANY TWO (2) QUESTIONS.**

09. If a transmitter produce 100W of power, express the transmitted power in (a) dBm, (b) dBW. **10marks**
10. Discuss the different types of travelling wave antennas and aperture antennas. **10marks**
11. Referring to the figure below, explain the critical angle and its effect on the radio wave transmission from transmitter antenna in X (A, B and C are waves). **10marks**



**SECTION I. EIGHT (8) COMPULSORY QUESTIONS.**

01. What is image frequency? **2marks**
02. Which are the components of the signal in case of line-of-sight reception **2marks**
03. Which range of frequencies is used for line-of-sight communication in ionosphere layer? **2marks**
04. Identify two (2) reference signals the color television system PAL needs. **2marks**
05. Outline any four (4) different factors affecting choice of modulation type? **4marks**
06. Identify the parameters of a radio receiver. **5marks**
07. Identify different components of a radiofrequency tuner of an FM receiver. **3marks**
08. List in order (from input to output) the components of a super heterodyne receiver (AM). **10marks**

**SECTION II. ATTEMPT ANY TWO (2) QUESTIONS.**

09. Discuss the advantages of digital television system. **10marks**
10. (a) Identify the signals that you get on output of synchropulse generator in color TV system PAL. **8marks**
- (b) What is video luminance? **2marks**
11. Determine the output signal of a modulator; case of amplitude modulation. **10marks**