1E9203

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M.TECH. I Sem. Main &Back Examination, Jan.-Feb. 2014
Digital Communication
1 MDC3 Satellite Communication

Time: 3 Hours

Maximum Marks: 100

Min. Passing Marks: 33

Instructions to Candidates:-

Attempt any *five* questions.   rtuonline.com

Marks of questions are indicated against each question. Draw neat and comprehensive sketches wherever necessary to clearly illustrate your answer. Assume missing data suitably if any and specify the same.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1._____   2._____

Q.1 (a) What are Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law of planetary motion. What do the terms perigee & apogee mean when used to describe the orbit of a satellite orbiting the earth?   [10]

(b) An earth station situated in the Docklands of London, England needs to calculate the look angle to a geostationary satellite in the Indian Ocean operated by Intelsat. The details of the earth station site & the satellite are as follows:

Earth station latitude & longitude are 52.0° N & 0°   Satellite longitude is 66.0° E

Q.2 (a) Explain the principle & various sub system of satellite communication. [10]

(b) Explain sources of noise & types of noise & losses in satellite communication. [10]

Q.3 (a) Explain the following -

(i) TDMA frame structure

(ii) Synchronization in TDMA N/Ws

(iii) Unique word

(iv) Reference burst & preamble [10]

(b) In which cases DAMA is used in satellite communication? Explain the block diagram of FDMA – SCPL hub station. [10]

Q.4 (a) Explain the principle working of code division multiple access satellite system & compare it with FDMA & TDMA [10]

(b) Compute the effective noise temperature of Receiver whose noise figure is 16dB. In a satellite communication link, the uplink carrier to noise ratio is 25dB & downlink carrier to noise ratio is 20 dB. Find the link carrier to noise ratio in dB. [10]

How a telemetry tracking command & monitoring system works to control a satellite? [10]

Explain the principle of Attitude & Orbit Control System (AOCS) [10]

Q.6 (a) What is meant by a 'virtual link' in a N/W? Explain receive wind window & time out with reference to the internet.

(b) Describe the operation of a typical VSAT system. State briefly whe system finds widest application.

Q.7 Discuss in detail the following terms with respect to DBs-TV
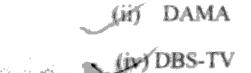
(i) Receiver

(ii) Master Control Station & Uplin

(iii) Installation

(iv) Error Control.

Q.8 Write short notes on the following –

(i) GPS

(ii) DAMA

(iii) TDM

(iv) DBS-TV