

3E9502

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M. Tech. III - Sem. (Main / Back) Exam., Jan. 2015

Digital Communication

3MDC'2.1 Telecommunication Switching & Networks

Time: 3 Hours

Maximum Marks: 100

Min. Passing Marks: 33

Instructions to Candidates:

Attempt any five questions. Marks of question 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. rtuonline.com

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

1. Scientific Calculator

2. NIL

Q. 1 (a) A TASI system has 10 channel and 20 sources connected to it. What is the probability of clipping if the activity factor for each source is 0.4? [10]

(b) Explain the Space-Time-Space switching (TST) and Time-Space-Time (TST) switching. [10]

Q. 2 (a) Calculate the maximum access time that can be permitted for the data and control memories in a TSI switch with a single input and single output trunk multiplexing 2500 channels. Also estimate the cost of the switch and compare it with that of a single stage space division switch. [10]

(b) Draw the structure of a three stage Non blocking switching matrix and prove that the no. of minimum cross point of this structure is:

$$N_n (\text{min}) = 4N (\sqrt{2} N - 1) \quad \text{rtuonline.com} \quad [10]$$

- (b) Find the fraunhofer distance for an antenna with maximum dimension of 2m & operating frequency is 900MHZ. If antenna have unity gain them calculate path loss. [5]

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Q. 3 State & explain the parameters of mobile multipath channels. [20]

Q. 4 (a) What is small scale fading? Explain the fading effects due to various parameters [10]

(b) Calculate the mean path loss using okumara's model for $d = 50\text{km}$, $h_{fe} = 100\text{m}$, $h_{re} = 10\text{m}$. In a suburban environment. If the base station transmitter radiates an IRP of 1KW at a carrier frequency of 900MHZ. Find EIPP dBm & the power at the receiver where gain at receiving antenna is 10dB. [10]

Q. 5 (a) What is OFDM? How does it help in minimising the inter symbol Interference? [10]

(b) Explain the significance of Fresnel zone concept in planning a network. [10]

Q. 6 (a) What are the different diversity schemes & how are they used in cellular communication N/W? [10]

(b) What do you mean by WAP state & explain with suitable diagram? [10]

Q. 7 Explain the channel scheme for GSM N/W & how the signal processing is achieved. [20]

Q. 8 (a) What are the different hand-off strategies used to determine the instant of hand off? [10]

State & explain the properties & generation of PN sequence code. [10]

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