Q.2a. **Differentiate between the indoor and outdoor propagation models. Name one model from each category.**

2.(a) Propagation Model: Empirical formula for the characterization of radio wave propagation as a function of frequency, distance & other conditions.

Modelling indoor propagation is more diffi-cult due to many reflections & scatte-rings etc. Also distances involved are small.

Outdoor prop. models: Okumar, Hata etc

Indoor prop. models: Log-distance path Loss Mode....

b.Explain and differentiate Wireless MAN, LAN and PAN

Ans. Page 24

Q.3a. **For a Rayleigh fading signal, compute the positive going level crossing rate of** $\rho =$ **1, when the maximum Doppler frequency is 20Hz. What is the maximum velocity of the mobile for this Doppler frequency if the carrier frequency is 900 MHz.**

Q3(a)

4 (a) No. of zerolevel crossing

$$N_R = \sqrt{2\pi(20)(1)e^{-1}} = 18.44 \qquad \text{(02)}$$

Velocity of the mobile at $f_m = 20Hz$

$$= f_d \cdot \lambda = 20 \times \frac{1}{3} = 6.66 \, m/s.$$

$$= 24 \, Km/hr \qquad \text{(02)}$$

b. Explain with diagram consequences of Doppler Effect on wireless communication.

Ans Page 71-72

Q.4   What is multiple access? Describe TDMA frame structure in detail.

Ans Page 146-147

Q.5 a.   Describe GPS system and its limitation.

Ans Page 276-277

b. Discuss the Hand-off strategies used in cellular communication system.

Ans Page 411

Q.6 a.   What are the different methods available for improving coverage & capacity of a cellular system? Explain any one in detail.

6. (a) Methods to improve coverage & Capacity

(i) Cell Splitting (ii) Sectsring

(iii) Repeaters for range extension

(iv) Microcell zone concepts.

Explaination about One

b. If a normal GSM time slot consists of six trailing bits, 8.25 guard bits, 26 training bits and two traffic bursts of 58 bits of data. Find the frame efficiency.

(b) Time slot has $6 + 8.25 + 26 + 2(58)$
$$= 156.25 \text{ bits.}$$

Frame has $8 \times 156.25 = 1250 \text{ bits/frame}$

No. of $= 8(6) + 8(8.21) + 8(26)$
$$= 322 \text{ bits.}$$

$\therefore \eta_F = 74.24$

Q.7 **a.** **Explain AMPS system and need for GSM.**

Ans.   221-223 page of textbook

b.The capacity of cellular CDMA & CDMA power control.

Ans. 229 page of textbook

Q.8 **a.** **Compare ad-hoc and infrastructure mode WLAN topologies.**

b. **Enumerate various security risks associated with wireless communication.**

Ans   440,441of textbook

Q.9 a. Describe different routing techniques.

Ans . Page – 303-313 of textbook

b.Explain different characteristics of MANETs.

Ans . Page – 304-305

Textbook

I. **Introduction to Wireless and Mobile Systems, Second Edition (2007), Dharma Prakash Agrawal and Qing-An Zeng, Thomson India Edition**