JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATION- April -2019

B.Tech. VIII Semester

COURSE CODE: 18B1WEC834   MAX. MARKS: 25

COURSE NAME: Fundamentals of Next Generation Communication System

COURSE CREDITS: 03   MAX. TIME: 1 HRS 30 MINS.

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1 (a) With the help of mathematical analysis prove that diversity can be employed to improve the performance of wireless system.

(b) What is the SNR required to achieve the BER of 10^{-6} with three receiver antenna diversity?   [CO4]   [3+2]

Q.2 Explain different types of control channels used in GSM system.   [CO1] [5]

Q.3 (a) If average power profile of signal is given as $\varphi(t) = \alpha \exp(-\tau/\beta)$, where $\alpha = 3$ dB and $\beta = 2\mu\text{Sec}$. Find rms delay spread for this power profile.

(b) Differentiate between flat fading and frequency selective fading with suitable example.
                                     [CO3] [3 + 2]

Q.4 (a) If two multiple paths are present between transmitter and receiver. Attenuation and delay of 1st and 2nd path are 2 & $1/f_c$ and 4 & $1/2f_c$ respectively. Find the complex fading coefficient.

(b) What is the probability of deep fade in receiver antenna diversity when diversity order is 4 and SNR = -5dB.   [CO2]   [3+2]

Q.5 Answer the following questions :   [CO1]   [1*5=5]

(a) Why flat fading occurs in GSM ?

(b) Why multiple antennas are not employed in GSM phones?

(c) Why we use internal clock in each device of GSM network if every device uses the primary reference clock?

(d) What is duplex frequency spacing in GSM?

(e) Differentiate between half rate and full rate traffic channels.