BIRLA INSTITUTE OF TECHNOLOGY, MESRA: RANCHI
(END SEMESTER EXAMINATION)

CLASS : MTECH SEMESTER :II
BRANCH : ECE SESSION : SP22

Subject with Code: EC 560 WIRELESS SIGNAL PROPAGATION

TIME : 2.00 HOURS FULL MARKS : 50

INSTRUCTIONS :

1. This question paper contains 5 questions each of 10 marks and total 50 marks.
2. Candidates must attempt all the questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question, paper be sure that you have got the correct question paper.

Q1(a)	Derive expression to represent the received signal using free space path loss model.	[5]
Q1(b)	What are the specific features of wireless mobile environment? Sketch a diagram to represent a typically received signal in wireless mobile environment.	[2+3]
Q2(a)	State the significance of Okumura model and explain how it can be used to estimate path loss.	[5]
Q2(b)	A transmitting antenna having 30 m height transmits at 800 MHz frequency. Using Hata model considering urban environment find the path loss at a receiver having 2m height, at 10 km away from the transmitter. How much extra path loss occurs in Hata model compared to free space propagation model?	[5]
Q3(a)	Explain parameters used to describe characteristics of the wireless channels?	[5]
Q3(b)	A power delay profile indicates a maximum excess delay of 50 ns. Assuming exponentially decaying profile and Rayleigh fading channel, find the maximum transmission bandwidth for ISI free transmission.	[5]
Q4(a)	What do you mean by equalization and adaptive equalization? Using a block diagram explain the operation of an equalizer as implemented in the receiver.	[5]
Q4(b)	Using suitable diagrams explain various combing techniques.	[5]
Q5(a)	What do you mean by slow fading and fast fading?	[3]
Q5(b)	What is channel state information?	[3]
Q5(c)	Find an expression for capacity of a flat fading channel when only CDI is available.	[4]