27. a.	Examine the free space propagation model in detail with no obstacle in between the transmitter & receiver.	10	2	2	2
	(OR)				
b.	Calculate the mean pathless using Okumura's Model for d = 50m, t_{he}=100m, h_{re}=10m in a suburban environment. Given carrier frequency is 900MHz, A_{mg} = 43dB X G_{area} = 9dB.	10	3	2	2
28. a.	Describe the impulse response model of a multipath channel.	10	2	3	3
	(OR)				
b.	What is fading and explain the different types of fading?	10	2	3	1
29. a.	Explain in detail capacity in fading channel (AWGN) on Ergodic capacity & Outage capacity.	10	2	4	1
	(OR)				
b. i.	Illustrate in detail Rake receiver with a neat Block Diagram	8	3	6	1
ii.	Write short notes on Equalizer.	2	2	4	1
30. a.	Sketch & Explain in detail on GSM architecture.	10	3	5	1
	(OR)				
b.	Explain in detail forward & Reverse Process in CDMA	10	2	5	1

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Reg. No.														

B.Tech. DEGREE EXAMINATION, MAY 2022
Seventh Semester

18ECC301T – WIRELESS COMMUNICATIONS
(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

	Marks	BL	CO	PO
PART – A (25 × 1 = 25 Marks)				
Answer **ALL** Questions				
1. A cluster in a cellular system is a _____ (A) Group of Frequencies (B) Group of Cells (C) Group of Subscribers (D) Group of Mobile Systems	1	1	1	1
2. Which of the following is a 3G standard (A) GSM (B) GPRS (C) LTE (D) UMTS	1	1	1	1
3. The first wireless communication model is summed of by _____ (A) NMT – NORDIC Mobile Telephone System (B) Microwave Mobile Radio (C) Advanced Mobile Phone System (AMPS) (D) Nippon Telephone & Telegraph (NTT)	1	1	1	1
4. Time required for allocating trunked radio channel to the requesting user is _____ (A) Set up Time (B) Holding Time (C) Dwell Time (D) Request Time	1	1	1	1
5. The difference between the cordless Phone & WLAN is _____ (A) SNR (B) BER (C) Data Rate (D) Bandwidth	1	1	1	1
6. The Fraunhofer Distance of transmitted antenna is determined as _____ (A) $d_f = \frac{2D}{\lambda^2}$ (B) $d_f = \frac{4D^2}{\lambda}$ (C) $d_f = \frac{4D}{\lambda^2}$ (D) $d_f = \frac{2D^2}{\lambda}$	1	1	2	1
7. The propagation models that characterize the rapid fluctuations of the required signal strength over very short travel distances are called (A) Large Scale Propagation Models (B) Small Scale Propagation Models (C) Free Space Propagation Models (D) Medium Scale Propagation Models	1	1	1	1

8. HATA model is applicable & valid for frequencies in the range of _____ 1 1 2 1
   (A) 150MHz – 1920 MHz (B) 150 KHz – 1500 KHz
   (C) 150 MHz – 1500 MHz (D) 1800 KHz – 2300 KHz

9. Which of the following model is accurate for predicting the large – scale signal strength over distances of several kelometres? 1 1 2 1
   (A) Two – Ray Ground Reflection Model (B) Knife – Edge Diffraction Model
   (C) Long – Distance path Loss Model (D) Hata Model

10. A common method for modelling path loss in outdoor microcells K indoor channel is a _____ of dB loss versus Log – Distance 1 1 3 1
   (A) Radar Cross Section Model (B) Piecewise Linear Model
   (C) Wideband PCS Microcell Model (D) Attenuation Factor Model

11. Which among the following should be reduced to accomplish a faster sweep time? 1 1 2 1
   (A) Time Resolution (B) Excess Delay
   (C) Transmitivity Response (D) Frequency

12. The main problem involved in direct RF channel pulse measurement system is _____ 1 2 3 1
   (A) Interference & Noise (B) Doppler Effect
   (C) Excess Delay Spread (D) Lack of Complexity

13. The time delay during which multipath energy falls to X dB below the maximum is called _____ 1 3 3 1
   (A) Mean Excess Delay (B) RMS Delay Spread
   (C) Excess Delay Spread (D) Maximum Excess Delay

14. For frequency selective fading, the spectrum of a transmitted signal has a bandwidth greater than _____ of a channel 1 1 3 1
   (A) Coherence Time (B) Doppler Spread
   (C) Delay Spread (D) Coherent Bandwidth

15. Which of the following distribution is commonly used to describe the statistical time varying nature of the received envelope of a flat fading signal? 1 2 3 1
   (A) Ricean Distribution (B) Rayleigh Distribution
   (C) Erlang Distribution (D) Gausian Distribution

16. The capacity of a binary symmetric channel, given H(P) is binary entropy function is _____ 1 1 4 1
   (A) 1 –H(P) (B) H(P) – 1
   (C) $1 - H(P)^2$ (D) $H(P)^2 - 1$

17. Consider an AWGN channel with SNR = 18.55 dB. What is the capacity of the channel for unit Bandwidth? 1 1 5 1
   (A) 4.234 bits / Sec / Hz (B) 5.45 Bits / Sec / Hz
   (C) 6.18 Bits / Sec / Hz (D) 7.88 Bits / Sec / Hz

18. Which type of diversity schemes have both diversity gain as well as array gain? 1 1 4 1
   (A) Transmitter Diversity Schemes (B) Receiver Diversity Schemes
   (C) Symbol Rate (D) Modulation Scheme

19. The AWGN is _____ in channel 1 1 4 1
   (A) Linear, Time Variant (B) Linear, Time Invariant
   (C) Non-Linear, Time Variant (D) Non-Linear Time Invariant

20. Which technique is used by Rake receiver? 1 1 6 1
   (A) CDMA (B) TDMA
   (C) FDMA (D) OFDM

21. Which is the reverse link channel used to acknowledge the subscriber? 1 1 4 1
   (A) RACH (B) AGCH
   (C) DCCH (D) PCH

22. What is the user data channel chip rate of CDMA IS – 95? 1 1 5 1
   (A) 9-6 Mchip/s (B) 1.2088 Mchip/s
   (C) 12-288 Mchip/s (D) 0.96 Mchip/s

23. What is the relationship between the sub carrier spacing f x symbol time t is OFDM? 1 1 6 1
   (A) $f = \frac{1}{t}$ (B) $f = \frac{2}{t}$
   (C) $f = t$ (D) $f = \frac{1}{2t}$

24. How much the spectral efficiency of W-CDMA increases when compared with GSM? 1 1 6 1
   (A) IEEE 802.16 (B) IEEE 802.11
   (C) IEEE 802.3 (D) IEEE 802.15

25. In frequency hoping technique _____ duration is shorter than the _____ duration 1 1 5 1
   (A) HOP, Symbol (B) Symbol, HOP
   (C) CHIP, Symbol (D) CHIP, HOP

PART – B (5 × 10 = 50 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
26. a. i.	Illustrate the operation of cell splitting & sectoring?	8	2	1	1
ii.	Define Grade of Service	2	1	1	1
	(OR)				
b.	Describe the various strategies used in channel assignment for cellular radio system.	10	2	1	1