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

		Marks	BL	CO	PO
26. a.	Describe the various types of handoff techniques with neat diagram.	10	4	1	1
	(OR)				
b.i.	Explain the characteristics of cellular telephone systems.	5	2	1	12
ii.	Compare blocked cell cleared system and blocked cell delayed systems.	5	3	1	4
27. a.	Deduce an expression to show that path loss two ray model can be $P_L(dB) = 40\log d - (10\log G_t + 10\log G_r + 20\log h_t + 20\log h_r)$	10	4	2	4
	(OR)				
b.	Explain in detail about three significant wave propagation mechanism that affect the propagation of EM waves.	10	4	2	4
28. a.i.	Write the most important effects of small scale multipath propagation.	6	2	3	2
ii.	Discuss about Ricean fading effect.	4	3	3	3
	(OR)				
b.	Explain the baseband impulse response model with relevant expression.	10	2	3	3
29. a.	Explain the following with neat diagram (i) Selection combining (ii) Feedback combining (iii) Maximal ratio combining	3 3 4	2	4	7
	(OR)				
b.	Explain the working principle of RAKE receiver in CDMA system with neat diagram.	10	3	4	7
30. a.	Explain with necessary diagram of OFDM transceiver.	10	3	5	6
	(OR)				
b.	Elaborate in detail the GSM frame structure and its interfaces.	10	3	5	3

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Reg. No.														

B.Tech. DEGREE EXAMINATION, NOVEMBER 2022
Sixth and Seventh Semester

18ECC301T – WIRELESS COMMUNICATION
(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

PART – A (25 × 1 = 25 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
1.	During the handoff process in the cellular system, the margin (threshold) is given (A) $\Delta = Pr$ (Hand off) –Pr(max.usable) (B) $\Delta = Pr$ (Hand off) –Pr (min.usable) (C) $\Delta = Pr$ (SAR of the mobile) –Pr(min.usable) (D) $\Delta = Pr$ (cell) –Pr(Base station)	1	1	1	1
2.	Erlang C system's probability depends up on the (A) Block calls (B) Blocked calls and delay (C) Only the delayed calls (D) Erlang B	1	1	1	4
3.	The original base station is surrounded by _____new microcell. (A) 3 (B) 4 (C) 5 (D) 6	1	1	1	12
4.	In the case of cell splitting with radius if $\frac{R}{4}$, P_T is reduced by _____dB with newer cell. Assume 'n' is the path loss. (A) 3 n (B) 6 n (C) 4 n (D) 2 n	1	1	1	1
5.	In a Trunked Radio System (TRS) user is allocated a channel on a _____ (A) Per frequency basis (B) Per channel basis (C) Per base station basis (D) Per call basis	1	1	1	4
6.	_____occurs when the radio path between the transmitter and receiver is obstructed by a surface that has sharp irregularities. (A) Diffraction (B) Scattering (C) Refraction (D) Reflection	1	2	2	4
7.	The Effective Isotropic Radiated Power $(EIRP)$ is (A) $P_t G_t$ (B) P_T / G_t (C) P_t / G_r (D) $P_r G_t$	1	1	2	4

8. Calculate the Brewster angle for a wave impinging on ground having permittivity of $\varepsilon_r = 5$ — 1 2 2 2

(A) 21.09 (B) 22.09
(C) 23.09 (D) 24.09

9. _____model uses diffraction to predict average signal strength at street level. — 1 1 2 2

(A) Okumura (B) Walfish and Bertoni
(C) Hata (D) Durkin's

10. The effective aperture is related for the physical size of the following — 1 2 2 4

(A) Antenna (B) Mobile
(C) System (D) Mobile user

11. The envelope of sum of two quadrature Gaussian noise follows_____ — 1 1 3 3

(A) Nakagami (B) Rayleigh
(C) Inverse Gaussian (D) Gamma

12. The power delay profile helps determining — 1 1 3 3

(A) Small scale delay (B) RMS delay spread
(C) Minimum delay spread (D) Excess Doppler spread

13. The presence of reflecting objects and scatters in the channel create a constantly changing environment that dissipated the signal energy in amplitude, phase and time is known as _____ — 1 1 3 3

(A) Multipath propagation (B) Doppler effect
(C) Line of sight (D) Doppler shift

14. Identify, which method help us to determine the power delay profile directly — 1 1 3 2

(A) Direct RF pulse system (B) Correlator
(C) Spectrum sliding (D) Spread spectrum sliding correlator

15. Random frequency modulation occurs due to varying _____on different multipath signals. — 1 1 3 3

(A) Doppler shift (B) Echoes
(C) Time interval (D) Doppler spread

16. The channel SNR, the power $x(i)$ divided by the power in $n(i)$, is constant given by — 1 1 4 7

(A) $\gamma = \frac{P}{N_0 B}$ (B) $\gamma = \frac{P}{2N_0 B}$
(C) $\gamma = \frac{PN_0}{2B}$ (D) $\gamma = \frac{2P}{N_0 B}$

17. Mutual information can also be written interms of the entropy in the channel output 'Y' and the conditional output $\frac{Y}{X}$ as — 1 1 4 2

(A) $I(X:Y) = H(X) - H\left(\frac{Y}{X}\right)$ (B) $I(X:Y) = H(Y) - H\left(\frac{X}{Y}\right)$
(C) $I(X:Y) = H(Y) - H\left(\frac{Y}{X}\right)$ (D) $I(X:Y) = H(Y) + H\left(\frac{Y}{X}\right)$

18. _____is defined as the point at which the receiver power value falls below the threshold where the power value relates to minimum SNR within a cellular communication. — 1 1 4 2

(A) Outage capacity (B) Ergodic capacity
(C) Channel capacity (D) Outage probability

19. Which of these is necessary condition for optical power allocation? — 1 1 4 2

(A) Average transmit power is constant (B) Channel state information known at the transmitter
(C) Channel state information known at the receiver (D) Increased transmit power

20. RAKE receiver uses separate _____to provide the time shifted version of the signal. — 1 1 4 2

(A) IF receiver (B) Equalizer
(C) Correlation receiver (D) Channel

21. _____manages the switching function of GSM. — 1 1 5 3

(A) ESS (B) OSS
(C) MSC (D) NSS

22. _____takes care of the handoff. — 1 1 5 3

(A) BSC (B) Mobile
(C) BS (D) BTS

23. _____increases required transmission bandwidth operation of OFDM. — 1 1 5 3

(A) Cyclic prefix (B) QAM
(C) ISI (D) CDMA

24. In quadrature modulation how many channels are used for transmission? — 1 1 5 6

(A) 2 (B) 4
(C) 6 (D) 8

25. On the forward link the user data stream is encoded using rate _____convolutional code. — 1 1 5 6

(A) $\frac{1}{4}$ (B) $\frac{3}{4}$
(C) $\frac{1}{8}$ (D) $\frac{1}{2}$