18ECC301T – Wireless Communication

Name		Unit No.	5
Designation / Department		Unit Title	Wireless Systems and Standards

Notations

M - Marks
CO - Course Learning Outcome
BL - Bloom's Level (1. Remembering | 2. Understanding | 3. Applying | 4. Analysing | 5. Evaluating | 6. Creating)
PI - Performance Indicator Code

Q. No.	MCQ		M	CO	BL
1.	AMPS has channel bandwidth of ----------		1	5	1
	A.	25 KHz			
	B.	30 KHZ			
	C.	40 KHz			
	D.	45 KHz			
	Ans.	B			
2.	---------- modulation technique is used in AMPS		1	5	1
	A.	Amplitude			
	B.	Frequency			
	C.	Phase			
	D.	Quadrature amplitude			
	Ans.	B			
3.	Encryption is done in ---------- system		1	5	1
	A.	AMPS			
	B.	ETAC			
	C.	GSM			
	D.	TAC			
	Ans.	C			
4.	---------- is the world first cellular system to specify digital modulation._____		1	5	1
	A.	AMPS			
	B.	ETAC			
	C.	IS-95			

	D.	GSM			
	Ans.	D			
5.	The --------- interface allows a service provider to use base stations and switching equipment made by different manufacturers.		1	5	1
	A.	A			
	B.	Abis			
	C.	Air interface			
	D.	SS7			
	Ans.	A			
6.	GSM consists of _____ major interconnected subsystems.		1	5	1
	A.	2			
	B.	3			
	C.	4			
	D.	6			
	Ans.	B			
7.	GSM committee specified a common mobile communication system for Europe in -------_band		1	5	1
	A.	400 KHz			
	B.	400 MHz			
	C.	900 KHz			
	D.	900 MHz			
	Ans.	D			
8.	Abis interface connects a BTS to a ----------		1	5	1
	A.	BSC			
	B.	MSC			
	C.	PSTN			
	D.	Mobile terminal			
	Ans.	A			
9.	---------- is present in Network switching subsystem		1	5	1
	A.	Base transceiver station			

	B.	Base station subsystem			
	C.	Authentication center			
	D.	Mobile station			
	Ans.	C			
10.	Mobile handoff s between two BTSs under same BSC are handled by -----		1	5	1
	A.	BSC			
	B.	MSC			
	C.	NSS			
	D.	MS			
	Ans.	A			
11.	A hyperframe in GSM,consists of ---------- superframes		1	5	1
	A.	256			
	B.	512			
	C.	1024			
	D.	2048			
	Ans.	D			
12.	In GSM traffic channel, multiframe consists of ---------- TDMA frames		1	5	1
	A.	8			
	B.	16			
	C.	26			
	D.	32			
	Ans.	C			
13..	In GSM superframe how many multiframes are available?		1	5	1
	A.	51			
	B.	16			
	C.	8			
	D.	48			
	Ans.	A			
14.	In GSM, ---------- time slots are present per TDMA frame		2	5	1

	A.	8			
	B.	16			
	C.	24			
	D.	32			
	Ans.	A			
15.	In IS-95 forward channel, data scrambler performs----------		1	5	1
	A.	Binary division			
	B.	Random generation			
	C.	Modulo 2 addition			
	D.	Binary subtraction			
	Ans.	C			
16.	Pilot channel in IS-95 is transmitted at a power level ------- the power level of user channel		1	5	1
	A.	Higher than			
	B.	Lower than			
	C.	Equal to			
	D.	Equal to half			
	Ans.	A			
17.	In IS-95 the forward and reverse channel pair is separated by -----		1	5	1
	A.	45 KHz			
	B.	45 MHz			
	C.	35 KHz			
	D.	35 MHz			
	Ans.	B			
18.	---------- adds binary data to the ciphered blocks, in order to help synchronization and equalization of the received signal.		1	5	1
	A.	Modulation			
	B.	Interleaving			
	C.	Burst formatting			
	D.	Source coding			
	Ans.	C			

19.	In GSM, ---------- modulation is used		1	5	1
	A.	FSK			
	B.	0.3 GMSK			
	C.	0.5 PSK			
	D.	QAM			
	Ans.	B			
20.	In GSM, the frequency range of forward channel is ---------		1	5	1
	A.	935-960 KHz			
	B.	935-960 MHz			
	C.	890-915 KHz			
	D.	890-915 MHz			
	Ans.	B			
21.	In GSM, the frequency range of reverse channel is ---------		1	5	1
	A.	935-960 KHz			
	B.	935-960 MHz			
	C.	890-915 KHz			
	D.	890-915 MHz			
	Ans.	D			
22.	GSM has ---------- main logical control channels		1	5	1
	A.	2			
	B.	3			
	C.	4			
	D.	6			
	Ans.	B			
23.	In IS-95 foward channel, ---------- code is used		1	5	1
	A.	hamming			
	B.	cyclic			
	C.	block			
	D.	walsh			

	Ans.	D			
24.	---------- orthogonal modulation is used in IS-95 reverse channel		1	5	1
	A.	16-ary			
	B.	32-ary			
	C.	64-ary			
	D.	128-ary			
	Ans.	C			
25.	In IS-95 forward channel, the user data stream is encoded using ------- rate convolutional code.		1	5	1
	A.	1/4			
	B.	3/4			
	C.	1/2			
	D.	1/8			
	Ans.	C			
26.	The IS-95 reverse channel user data stream is encoded with a rate of _____		1	5	1
	A.	1/4			
	B.	3/4			
	C.	1/3			
	D.	1/8			
	Ans.	C			
27.	The period of pilot sequence used in forward IS-95 channel is ---------- chips.		1	5	1
	A.	2^{15}-1			
	B.	2^{18}-1			
	C.	2^{24}-1			
	D.	2^{42}-1			
	Ans.	A			
28.	ISI can be reduced by ----------		1	5	1

	A.	Multiplexing			
	B.	Encoding			
	C.	Multi carrier modulation			
	D.	Encryption			
	Ans.	C			
29.	How many types of masks are used in the long code generator?		1	5	1
	A.	four			
	B.	three			
	C.	two			
	D.	one			
	Ans.	C			
30..	In IS-95 forward channel, each data symbol is spread by ---------- Walsh chips		1	5	1
	A.	16			
	B.	32			
	C.	64			
	D.	128			
	Ans.	C			
31.	GSM data services are limited upto ---------- layer of OSI reference model		1	5	1
	A.	application			
	B.	presentation			
	C.	transport			
	D.	network			
	Ans.	D			
32.	Which one of the user data rate is not applied as input to forward IS-95 channel?		1	5	1
	A.	600bps			
	B.	1200bps			
	C.	2400bps			
	D.	9600bps			

	Ans.	A			
33.	_____ modulation converts a frequency selective fading into flat fading channel.		1	5	1
	A.	Frequency			
	B.	Quadrature amplitude			
	C.	Multi carrier			
	D.	Phase shift keying			
	Ans.	C			
34.	Feeding antenna is usually a ------- antenna in reflectarray antennaa		1	5	1
	A.	Yagi-uda			
	B.	horn			
	C.	Parabolic			
	D.	Log-periodic			
	Ans.	B			
35.	---------- converts linear convolution between the channel input and impulse response into circular convolution		1	5	1
	A.	Parallel to serial converter			
	B.	Cyclic prefix			
	C.	Walsh code			
	D.	Serial to parallel converter			
	Ans.	B			
36.	Cyclic prefix is done in OFDM to ----------		1	5	1
	A.	reduce input power			
	B.	reduce inter symbol interference			
	C.	convert analog to digital signal			
	D.	achieve scalability			
	Ans.	B			
37.	The period of long PN sequence used in forward IS-95 channel is ---------- chips.		1	5	1

	A.	2^{25}-1			
	B.	2^{32}-1			
	C.	2^{42}-1			
	D.	2^{48}-1			
	Ans.	C			
38.	GSM is an acronym of ----------		1	5	1
	A.	Global System for Mobile communication			
	B.	Global Standard Multiplexing			
	C.	Group System Multiplexing			
	D.	Group System for Mobile communication			
	Ans.	A			
39.	---------- antennas are used in WBAN		1	5	1
	A.	Wearable			
	B.	Transmitarray			
	C.	Automotive			
	D.	Reflectarray			
	Ans.	A			
40.	In reverse IS-95 channel , user data is grouped into ---------- frames		1	5	1
	A.	10 ms			
	B.	15 ms			
	C.	20 ms			
	D.	30 ms			
	Ans.	C			

Part B questions

1. Draw the block diagram of AMPS voice modulation process.
2. Compare the specifications of 1G and 2G cellular systems.
3. Write in brief about GSM services.
4. Draw the GSM frame structure. How many frames are made into multi, super and hyper frames?
5. What is cyclic prefix? Write the importance of it in OFDM.
6. Discuss in brief about modern antennas.
7. Write short notes on multicarrier modulation.
8. List the advantages and disadvantages of OFDM.

Part C questions

1. Explain in detail about AMPS voice modulation process.
2. Discuss elaborately about the GSM system architecture.
3. List the specifications of GSM and explain its interfaces with a neat sketch.
4. If GSM uses a frame structure where each frame consists of S time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (a) the time duration of a bit, (b) the time duration of a slot,(c) the time duration of a frame, and (d) how long must a user occupying a single time slot must wait between two simultaneous transmissions.
5. If a normal GSM time slot consists of 6 trailing bits, 8.25 guard bits, 26 training bits, and 2 traffic bursts of 58 bits of data, find the frame efficiency.
6. Explain in detail about the GSM operation from speech input to speech output.
7. With neat sketch of OFDM Transmitter and Receiver block diagrams, summarize its working principle.
8. Explain in detail about IS-95 forward channel with relevant block diagram.
9. Explain in detail about IS-95 reverse channel with relevant block diagram.