Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2016

Examination: Final Year Semester VIII

Course Code: ECCDLO8043 and Course Name: Satellite Communication

1)	Which of the following components receives, translates the signal frequency and re-transmits the signal in a satellite?	Answer
a.	Repeater	
b.	Relay	
c.	**Transponder**	**C**
d.	Transducer	
2)	What is the number of transponders if the satellite uses 12 channels of frequency and frequency reuse is implemented?	
a.	12	
b.	6	
c.	**24**	**C**
d.	3	
3)	In Rf tuning, what is the first local oscillator?	
a.	Quartz oscillator	
b.	**Frequency synthesizer**	
c.	Magnetic oscillator	
d.	Electric oscillators	
4)	What type of satellite TV service uses compressed data transmission to beam signals directly to every home?	
a.	**Direct broadcast satellite**	
b.	Mobile satellite service	A
c.	Broadcasting satellite service	
d.	Fixed satellite service	
5)	Which frequency band does the direct broadcast satellite system use?	
a.	C band	
b.	X band	
c.	**Ku band**	**C**
d.	MF band	
6)	What is the number of satellites present in the Iridium system?	
a.	72	
b.	51	
c.	**66**	**C**
d.	32	
7)	Which frequency band is used for connecting the satellite system with the	

	public switched telephone network?	
a.	L band	
b.	Ku band	
c.	C band	
d.	**Ka band**	**D**
8)	The noise power of any device becomes 0 when	
a.	**Absolute Temperature is 0**	**A**
b.	Antenna gain is 0	
c.	Transmitted power is 0	
d.	Radiation Energy incident on the device is 0	
9)	An LNA is connected to a receiver which has a noise figure of 12 dB. The gain of the LNA is 40 dB, and its noise temperature is 120 K. Calculate the overall noise temperature referred to the LNA input.	
a.	**120.43 K**	**A**
b.	150.21 K	
c.	140.2 K	
d.	125.5 K	
10)	For a satellite circuit the individual link carrier-to-noise spectral density ratios are: uplink 100 dBHz; downlink 87 dBHz. Calculate the combined C/N0 ratio	
a.	67.89 dBHz	
b.	89.67 dBHz	
c.	79.86 dBHz	
d.	**86.79 dBHz**	**D**
11)	A satellite signal transmitted from a satellite transponder to earth's station is called as	
a.	Uplink	
b.	**Downlink**	**B**
c.	Terrestrial	
d.	Earth bound	
12)	RFL occur due to	
a.	**Connection between receive antenna and receiver**	**A**
b.	Connection between mixer and amplifier	
c.	Antenna misalignment	
d.	Connection between antenna and amplifier	
13)	In Rf tuning, what is the first local oscillator?	
a.	Quartz oscillator	
b.	**Frequency synthesizer**	**B**
c.	Magnetic oscillator	
d.	Electric oscillators	
14)	Define S/N ratio	

a.	The S/N introduced in the preceding section is used to refer to the ratio of signal power to noise power at the receiver output. This ratio is sometimes referred to as the post detector.	
b.	**The S/N introduced in the preceding section is used to refer to the ratio of signal power to noise power at the receiver input. This ratio is sometimes referred to as the post detector.**	**B**
c.	Either of them	
d.	None of above	
15)	Unit of dbW is relative to	
a.	1mW	
b.	**1W**	**B**
c.	1kW	
d.	20W	
16)	Calculate Noise Factor for a circuit having noise figure 16.23	
a.	**42**	**A**
b.	23	
c.	16	
d.	54	
17)	Is a loss of power of a satellite downlink signal due to earth's atmosphere.	
a.	Atmospheric loss	
b.	**Path loss**	B
c.	Radiation loss	
d.	RFI	
18)	The equivalent Noise temperature for a system having Noise Factor 2, reference temperature 290K is	
a.	**290K**	**A**
b.	300K	
c.	580K	
d.	132K	
19)	For global communication, the number of satellites needed is	
a.	1	
b.	**3**	**B**
c.	10	
d.	5	
20)	For southern hemisphere, if ES is to east of satellite then	
a.	A=180+A'	
b.	A=A'	
c.	A=360+A'	
d.	**A=360-A'**	**D**
21)	Autumn Equinox occurs near	
a.	21 December	

b.	21 March	
c.	**21 September**	**C**
d.	21 August	
22)	A single dipole will receive signal from circularly polarized wave at a loss of	
a.	0dB	
b	**3 dB**	**B**
c.	6dB	
d.	9dB	
23)	Which Law suggest that " the path followed by a satellite around the primary will be an ellipse "	
a.	**Keplers 1st law of satellite motion**	**A**
b.	Newtons third law of motion	
c.	Keplers 2nd law of satellite motion	
d.	Keplers 3rd law of satellite motion	
24)	MEO orbits are located at?	
a.	16-50km from surface of the earth	
b.	1600-5000km from surface of the earth	
c.	160-500km from surface of the earth	
d.	**10000-20000km from surface of the earth**	**D**
25)	What is the number of components of the vector that describes the translational motion of the vehicle?	
a.	**6**	**A**
b.	3	
c.	2	
d.	1	
26	…… is considered as the unsolved problem in satellite system.	
a.	Cost	
b.	Access	
c.	**Privacy**	**C**
d.	Coverage	
37	The discussing sharing of a communication satellite by many geographically dispersed Earth station, DAMA means	
a.	**Demand-Assigned Multiple Access**	**A**
b.	Decibel Attenuated Microwave Access	
c.	Digital Analog Master Antenna	
d.	Dynamically-Assigned Multiple Access	
28	Beam Switching by Transponder hopping is a solution of interconnection when :	
a.	Number of Beams are High	
b.	**Number of beams Low**	**B**
c.	Payload is High	

d.	Payload is Low	
29	The duration of connection between an Up Beam and Down Beam is defined as a :	
a.	Time slot	
b.	Frame	
c.	**Window**	**C**
d.	Frequency slot	
30	What is the process called when the state vector is calculated on board the vehicle?	
a.	Navigation	
b.	Guidance	
c.	Surveillance	
d.	Position location	
31	Which type of navigation measure the state vector without regard to the path travelled by the vehicle in the past?	
a.	Dead reckoning	
b.	**Positioning**	**B**
c.	Direct reckoning	
d.	AHRS	
32	Which one of the following does not fall under the positioning system?	
a.	Radio systems	
b.	Celestial systems	
c.	**AHRS**	**C**
d.	Mapping navigation systems	
33	Which of the following navigational systems is most stealthy?	
a.	Secondary surveillance radar	
b.	VOR	
c.	**Celestial navigation**	**C**
d.	SONAR	
34	How is the velocity of an aircraft measured by passive radio systems?	
a.	**Doppler shift**	**A**
b.	Velocity data is transmitted by the aircraft and received by the station	
c.	Secondary surveillance method	
d.	Satellite mapping	
35	The distance the aircraft has to cover in the ground to achieve takeoff speed is called?	
a.	**Ground roll**	**A**
b.	Take off distance	
c.	Runway length	
d.	Airborne distance	

36	The distance the aircraft climbs to clear an obstacle of particular height during takeoff is called as?	
a.	Ground roll	
b.	Take off distance	
c.	Runway length	
d.	**Airborne distance**	**D**
37	What is the take-off clearance height for a military aircraft?	
a.	**50ft**	**A**
b.	35ft	
c.	20ft	
d.	100ft	
38	The velocity at which yawing motion can be produced by rudder deflection while the aircraft is on the ground is called _____	
a.	Ground roll speed	
b.	Ground control speed	
c.	**Minimum control speed on the ground**	**C**
d.	Control speed	
39	For a satellite circuit the individual link carrier-to-noise spectral density ratios are: uplink 100 dBHz; downlink 87 dBHz. Calculate the combined C/N0 ratio.	
a.	84.4 dBHz	
b.	87.6 dBHz	
c.	85.9 dBHz	
d.	**86.79dBHz**	**D**
40	The height at which approach is aborted when the runway is not in sight is called as?	
a.	**Decision height**	**A**
b.	Approach altitude	
c.	Clearance altitude	
d.	Landing altitude	
41	What is Bandwidth available for C band :	
a.	50 GHz	
b.	50 MHz	
c.	**500 MHz**	**C**
d.	2 GHz	
42	TV transmission is	
a.	**Simplex**	**A**
b.	Half Duplex	
c.	Full Duplex	
d.	None of the above	
43	Winter solstice occurs near	

a.	**21 December**	**A**
b.	24 March	
c.	27 December	
d.	21 June	
44	Which band is used for DBS TV system :	
a.	C band	
b.	V band	
c.	VHF	
d.	**Ku Band**	**D**
45	In a typical mobile satellite array antenna if three elements are activated, how many elements are deactivated?	
a.	3	
b.	**11**	**B**
c.	5	
d.	9	
46	For an equatorial orbit, movement of the satellite about the Yaw axis moves the antenna footprint:	
a.	North and South	
b.	**EAST and West**	B
c.	North and West	
d.	South and East	
47	The most common device used as an LNA is	
a.	zener diode	
b.	**tunnel diode**	**B**
c.	IMPATT	
d.	Shockley diode	
48	The radiation patterns of earth coverage antennas have a beamwidth of approximately	
a.	21˚	
b.	5˚	
c.	**17**˚	**C**
d.	35˚	
49	What circuit is responsible in activating and deactivating adjacent antenna elements in a mobile satellite array?	
a.	**Radial divider**	**A**
b.	Divider/combiner	
c.	Radial combiner	
d.	Radial multiplexer	
50	The frequency band used by most satellite is	
a.	UHF	
b.	VHF	

c.	**SHF**	**C**
d.	EHF	
51	It is the direction of maximum gain of the earth station antenna	
a.	Footprint	
b.	**Boresight**	**B**
c.	Angle of elevation	
d.	Angle of azimuth	
52	What is meant by EIRP?	
a.	**Equivalent Isotropic Radiated Power**	**A**
b.	Energy Isotropic Radiated Power	
c.	Equivalent Isotropic Resonance Power	
d.	Energy Isotropic Resonance Power	
53	Which of the following is not usually a part of a transponder?	
a.	LNA	
b.	Mixer	
c.	**Modulator**	**C**
d.	HPA	
54	The satellite communications channel in a transponder are defined by the	
a.	LNA	
b.	**Bandpass filter**	**B**
c.	Mixer	
d.	Input signals	
55	The standby units are also called as	
a.	Guard band units	
b.	**Redundant units**	**B**
c.	Dispensable unit	
d.	Unwanted unit	
56	What is the PN sequence length for a PN sequence generated using a feedback register of length m=3 and chip rate 107 chips per second.	
a.	3	
b.	**15**	**B**
c.	**7**	
d.	8	
57	Calculate the frame efficiency for an INTELSAT frame where overhead bits are 6144 and total bits are 120832.	
a.	**94.9 %**	**A**
b.	50.84%	
c.	99.4%	
d.	84.50%	
58	In some phase detection systems, the phase detector must be allowed for	

	some time to receiver from one burst before the next burst receiving by it. The waiting time is known as_____	
a.	Preamble	
b.	Guard time	
c.	Frame efficiency	
d.	**Decoding quenching**	**D**
59	Which of the following is not a typical output from the GPS receiver?	
a.	Latitude	
b.	**Speed**	**B**
c.	Altitude	
d.	Longitude	
60	The echo heard by a telephone user on a satellite channel can be removed by using	
a.	A vocoder	
b.	A multiplexer	
c.	**Echo suppressor**	**C**
d.	Digital techniques	
61	Satellite used for intercontinental communications are known as	
a.	Domsat	
b.	Marisat	
c.	**Intelsat**	**C**
d.	Comsat	
62	In satellite communication, frequency modulation is used because satellite channel has	
a.	small bandwidth and negligible noise	
b.	**large bandwidth and severe noise**	**B**
c.	maximum bandwidth and minimum noise	
d.	high modulation index	
63	Determine angle of tilt λE = 39°; aGSO= 42164 km; R= 6371 km; b=λE = 59°	
a.	**11.7 degree**	**A**
b.	12.7 degree	
c.	16 degree	
d.	19 degree	
64	Which of the following is not a satellite subsystem?	
a.	**Ground station**	**A**
b.	Power system	
c.	Telemetry tracking	
d.	Communication subsystem	
65	The point where the orbit crosses the equatorial plane going from south to north is called as:	

a.	**Ascending Node**	**A**
b.	Centre of earth	
c.	Descending Node	
d.	Argument of Perigee	
66	The apogee distance from centre of earth for e=0.1 and semi-major axis 7000km is	
a.	7000km	
b.	**7700km**	**B**
c.	35786km	
d.	42000km	
67	In RF tuning, _____ provides the final up conversion to the microwave frequency?	
a.	Fixed-frequency local oscillator	
b.	**RF frequency synthesizer**	**B**
c.	Quartz oscillator	
d.	Magnetic oscillator	
68	For northern hemisphere, if ES is to east of satellite then	
a.	A=180-A’	
b.	**A=180+A’**	**B**
c.	A=360-A’	
d.	A=360+A’	
69	C – band of satellite communication ranges from	
a.	2-3 GHz	
b.	**4-8GHz**	**B**
c.	8-12GHz	
d.	12-16GHz	
70	The point nearest from earth in satellite orbit is called as	
a.	Semi minor axis	
b.	Apogee	
c.	**Perigee**	**C**
d.	Eccentricity	
71	The range between a ground station and a satellite is 43,000 km. Calculate the free-space loss at a frequency of 7 GHz.	
a.	100.2dB	
b.	150dB	
c.	**201.97dB**	**C**
d.	200.4 dB	
72	A satellite stay in orbit because the following two factors are balanced	
a.	Satellite weight and speed	
b.	**Gravitational force and centrifugal force**	B
c.	Centripetal force and speed	

d.	Satellite weight and the pull of the moon and sun	
73	The jet thrusters are usually fired to	
a.	**maintain altitude**	**A**
b.	put the satellite into the transfer orbit	
c.	inject the satellite in the geosynchronous orbit	
d.	bring the satellite back to earth.	
74	The physical location of a satellite is determined by its	
a.	distance from the earth	
b.	**latitude and longitude**	**B**
c.	reference to the stars	
d.	position relative to the sun	
75	Satellite that provide services within a single country	
a.	**Domsat**	**A**
b.	Comsat	
c.	Regional	
d.	Global	
76	The _____ angle measures the satellite position clockwise from the direction of true north.	
a.	**azimuth**	**A**
b.	elevation	
c.	depression	
d.	critical	
77	What is meant by GPRS ?	
a.	General packet receiver service	
b.	**General packet radio service**	**B**
c.	Global packet radio service	
d.	Global packet receiver service	
78	When individual up converters are used to modulate a channel, what is used to combine them into final signal?	
a.	**Microwave combiner**	**A**
b.	Multiplexer	
c.	Mixer	
d.	Amplifier	
79	What provides the sufficient drive to the final power amplifier?	
a.	**Intermediate-power amplifier**	**A**
b.	Operational amplifier	
c.	Power driver circuit	
d.	Up converter	
80	What technique does DSP use to double the number of channels by using helical antennas?	

a.	Spatial isolation	
b.	**Frequency reuse**	**B**
c.	Multiplexing	
d.	Modulation	
81	Noise Power at 100K and BW of 10 MHz is	
a.	1.38exp(-12)	
b.	1.38exp(-13)	
c.	**1.38exp(-14)**	**C**
d.	1.38exp(-15)	
82	A satellite link operating at 14 GHz has receiver feeder losses of 1.5 dB and a free-space loss of 207 dB. The atmospheric absorption loss is 0.5 dB, and the antenna pointing loss is 0.5 dB. Depolarization losses may be neglected. Calculate the total link loss for clear-sky conditions.	
a.	**209.5dB**	**A**
b.	201.8dB	
c.	205.9 dB	
d.	208.4dB	
83	The effective area of an isotropic antenna that operates at 14 GHZ.	
a.	-34.7dB	
b.	**-44.37dB**	**B**
c.	44.37dB	
d.	34.7dB	
84	A satellite is operated at an EIRP of 56 dBW with an output BO of 6 dB. The transmitter feeder losses amount to 2 dB, and the antenna gain is 50 dB. Calculate the power output of the TWTA required for full saturated EIRP.	
a.	16dBW	
b.	15dBW	
c.	**14dBW**	**C**
d.	18dBW	
85	Departure and approach are sub phases of what?	
a.	Landing phase	
b.	Take off phase	
c.	**Terminal phase**	**C**
d.	Surface phase	
86	All satellites rotate around the earth in an orbit that forms a plane that passes through the center of gravity of earth called ____.	
a.	Focus	
b.	**Geocenter**	B
c.	Orbit	
d.	Center	
87	In satellite communications, type of orbit which is virtually all orbits except those travel directly above the equator or directly over the North or the South	

	poles.	
a.	Equatorial orbit	
b.	Polar orbit	
c.	Geosynchronous orbit	
d.	**Inclined orbit**	D
88	It is the vertical angle formed between the direction of travel of an electromagnetic wave radiated from an earth station antenna pointing directly toward a satellite and the horizontal plane.	
a.	Angle of depression	
b.	Angle of inclination	
c.	**Angle of elevation**	**C**
d.	Angle of azimuth	
89	It is the horizontal angular distance from a reference direction either the southern or northern most point of the horizon.	
a.	Angle of elevation	
b.	Latitude	
c.	Longitude	
d.	**Azimuth**	**D**
90	It is the angle between the earth's equatorial plane and the orbital plane of the satellite measured counterclockwise.	
a.	Angle of elevation	
b.	Angle of azimuth	
c.	**Angle of inclination**	**C**
d.	Angle of tetrahedron	
91	The position of a satellite is measure	
a.	by its elevation angle with respect to the horizon	
b.	by its azimuth angle measured clockwise from the direction of true north	
c.	through the line of apsides	
d.	**by its elevation angle with respect to the horizon and its azimuth angle measured clockwise from the direction of true north**	**D**
92	An orbit when the satellite rotates in a path above the equator.	
a.	Polar orbit	
b.	Inclines orbit	
c.	**Equatorial orbit**	**C**
d.	Geosynchronous orbit	
93	How does interference between uplink and downlink signals be prevented?	
a.	By using different ground stations	
b.	By using different satellites	
c.	**By using different carrier frequencies**	**C**
d.	By different polarization	
94	A satellite is orbiting in the equatorial plane with a period from perigee to	

	perigee of 12 h. Given that the eccentricity is 0.002, calculate the semimajor axis. The earth's equatorial radius is 6378.1414 km.	
a.	25532Km	
b.	**26610Km**	**B**
c.	21610Km	
d.	23532Km	
95	In satellite communication, frequency modulation is used because satellite channel has	
a.	small bandwidth and negligible noise	
b.	**large bandwidth and severe noise**	**B**
c.	maximum bandwidth and minimum noise	
d.	high modulation index	
96	Phase modulation is commonly-used for data transmission mainly because	
a.	phase can be varied from + 180° to 180°	
b.	it gives highest data rates that can be transmitted over a given channel	
c.	demodulation is very easy	
d.	**it is resistant to the effects of noise**	**D**
97	Which of the following amplifiers is used in the transmitter substation?	
a.	RF amplifiers	
b.	Buffer amplifiers	
c.	**Klystron amplifier**	**C**
d.	Operational amplifiers	
98	The transmit and receive signals are separated in a device known as	
a.	diplexer	A
b.	modulator	
c.	demodulator	
d.	LNA	
99	An LNA is connected to a receiver which has a noise figure of 12 dB. The gain of the LNA is 40 dB, and its noise temperature is 120 K. Calculate the overall noise temperature referred to the LNA input.	
a.	125.2K	
b.	118.4K	
c.	**120.43K**	**C**
d.	122.3K	
100	For a satellite circuit the individual link carrier-to-noise spectral density ratios are: uplink 101.5 dBHz; downlink 93.2 dBHz. Calculate the combined C/N0 ratio.	
a.	91.45 dBHz	
b.	93.5 dBHz	
c.	94.6 dBHz	
d.	**92.6 dBHz**	**D**
