

University of Mumbai
Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks [20]
1	In RF receiver application the preamplifier has
Option A	Maximum gain amplifier
Option B	Low noise amplifier
Option C	Specific gain amplifier
Option D	Class A power amplifier
2	To design a maximally flat low pass filter with $f_c = 2$ GHz ,impedance of 50Ω and atleast 15 dB IL at 3 GHz the order N is
Option A	2
Option B	3
Option C	5
Option D	6
3	----- is a technique a technique that reduces or prevents coupling of undesired radiated electromagnetic energy into equipment to enable it to operator compatibility in its electromagnetic environment .
Option A	Filtering
Option B	Grounding
Option C	Shielding
Option D	Bonding
4	Direct digital frequency synthesis is obtained by solving digital recursion relationship using a general purpose computer or-----.
Option A	Direct frequency synthesis
Option B	A PLL-DDFS combination
Option C	Multiple loop indirect synthesis
Option D	Sorting sine waves in look up table
5	Inductor is replaced with ----- and capacitor is replaced with ----- of $\lambda/8$ line in Richard's transformation.
Option A	Short stub and open stub
Option B	Shunt capacitor and series inductor
Option C	Shunt inductor and series capacitor
Option D	Series Capacitor and series inductor
6	How instability can be created in oscillator design ?
Option A	Using capacitor in feedback
Option B	Using positive feedback
Option C	Using negative feedback
Option D	Using feed forward feedback
7	----- is not a EMC standard ,
Option A	CJNU FM
Option B	CISPR

Option C	MIL- STD 461 D
Option D	VDE
8	The maximum unilateral gain is a function of -----.
Option A	Source reflection coefficient
Option B	S parameters of transistors
Option C	Load reflection coefficient
Option D	Source and load reflection coefficients
9	Select one which is not a method of frequency synthesis,
Option A	Frequency synthesis by modulus divider
Option B	Direct frequency synthesis
Option C	Compressed frequency synthesis
Option D	Frequency synthesis by PLL
10	Is it possible to use normal smith chart for reading input impedance for reflection coefficient greater than one
Option A	Only possible for certain values of reflection coefficient
Option B	Possible
Option C	Not possible
Option D	Possible if magnitude of reflection coefficient is less than 5

Q.2	
A	Solve any two 5 marks each
i	Draw one port oscillator circuit. Find value of R_L which maximizes oscillator power .
ii	Draw two port amplifier . Define various gains with equations.
iii	Describe single balanced mixer using 90° hybrid coupler with neat diagram.
B	Solve any one 10 marks each
i	<p>A GaAs FET has the following scattering and noise parameters at 4 Ghz measured with 50Ω system</p> <p>$S_{11} = 0.6 \angle -60^\circ$, $S_{12} = 0.05 \angle -26^\circ$, $S_{21} = 1.9 \angle 81^\circ$, $S_{22} = 0.5 \angle -60^\circ$, $F_{min} = 1.6 \text{ dB}$, $R_n = 20 \Omega$ and $\Gamma_{opt} = 0.62 \angle 100^\circ$</p> <p>Assuming the FET to be unilateral . design an amplifier for maximum possible gain and noise figure not more than 2dB.</p>
ii	Design a composite low pass filter by image parameter method for following specifications $R_o = 50 \Omega$, $f_c = 50 \text{ MHz}$, $f_\infty = 52 \text{ MHz}$

Q3		
A	Solve any two	5 marks each
i	Compare design difference in amplifier and oscillator.	
ii	Explain the characteristics of power amplifier,	
iii	Explain the terms insertion loss, shape factor, quality factor ,rejection in filter.	
B	Solve any one	10 marks each
i	Design a two port transistor oscillator at 6 GHz using FET in common source configuration driving 50 Ω load on drain side $S_{11} = 0.9 \angle -150^\circ$, $S_{12} = 0.2 \angle -15^\circ$, $S_{21} = 2.6 \angle 50^\circ$, $S_{22} = 0.5 \angle -105^\circ$. Calculate and plot stability circles and choose Γ_t for $\Gamma_{in} \gg 1$. Design load terminating network	
ii	An N= 3 Chybshev bandpass filter is to be designed with 3 dB passband ripple for a communication link The centre frequency is at 2.4 GHz and filter has to meet bandwidth requirement of 20% .The filter has to be inserted into 50 Ω characteristic impedance	

Q4		
A	Solve any two	5 marks each
i	What are the sources of EMI and effects of EMI,	
ii	Explain differential FET mixer with diagram.	
iii	Write a note on safety grounding.	
B	Solve any one	10 marks each
i	S parameters of properly biased HFET-1101 measured using 50 Ω network analyzer at 6 GHz $S_{11} = 0.614 \angle -167.4^\circ$, $S_{12} = 0.046 \angle 65^\circ$, $S_{21} = 2.18 \angle 32.4^\circ$, $S_{22} = 0.716 \angle -83^\circ$ Design an amplifier using this for maximum possible gain	
ii	A one port oscillator uses a negative resistance diode having $\Gamma_{in} = 1.25 \angle 40^\circ$ $Z_o = 50 \Omega$ at its desired operating point for $f = 6\text{GHz}$. Design load matching network.	

Datasheet

TABLE 8.3 Element Values for Maximally Flat Low-Pass Filter Prototypes ($g_0 = 1$, $\omega_c = 1$, $N = 1$ to 10)

N	g_1	g_2	g_3	g_4	g_5	g_6	g_7	g_8	g_9	g_{10}	g_{11}
1	2.0000	1.0000									
2	1.4142	1.4142	1.0000								
3	1.0000	2.0000	1.0000	1.0000							
4	0.7654	1.8478	1.8478	0.7654	1.0000						
5	0.6180	1.6180	2.0000	1.6180	0.6180	1.0000					
6	0.5176	1.4142	1.9318	1.9318	1.4142	0.5176	1.0000				
7	0.4450	1.2470	1.8019	2.0000	1.8019	1.2470	0.4450	1.0000			
8	0.3902	1.1111	1.6629	1.9615	1.9615	1.6629	1.1111	0.3902	1.0000		
9	0.3473	1.0000	1.5321	1.8794	2.0000	1.8794	1.5321	1.0000	0.3473	1.0000	
10	0.3129	0.9080	1.4142	1.7820	1.9754	1.9754	1.7820	1.4142	0.9080	0.3129	1.0000

Source: Reprinted from G. L. Matthaei, L. Young, and E. M. T. Jones, *Microwave Filters, Impedance-Matching Networks, and Coupling Structures*, Artech House, Dedham, Mass., 1980, with permission.

TABLE 8.4 Element Values for Equal-Ripple Low-Pass Filter Prototypes ($g_0 = 1$, $\omega_c = 1$, $N = 1$ to 10, 0.5 dB and 3.0 dB ripple)

0.5 dB Ripple											
N	g_1	g_2	g_3	g_4	g_5	g_6	g_7	g_8	g_9	g_{10}	g_{11}
1	0.6986	1.0000									
2	1.4029	0.7071	1.9841								
3	1.5963	1.0967	1.5963	1.0000							
4	1.6703	1.1926	2.3661	0.8419	1.9841						
5	1.7058	1.2296	2.5408	1.2296	1.7058	1.0000					
6	1.7254	1.2479	2.6064	1.3137	2.4758	0.8696	1.9841				
7	1.7372	1.2583	2.6381	1.3444	2.6381	1.2583	1.7372	1.0000			
8	1.7451	1.2647	2.6564	1.3590	2.6964	1.3389	2.5093	0.8796	1.9841		
9	1.7504	1.2690	2.6678	1.3673	2.7239	1.3673	2.6678	1.2690	1.7504	1.0000	
10	1.7543	1.2721	2.6754	1.3725	2.7392	1.3806	2.7231	1.3485	2.5239	0.8842	1.9841

3.0 dB Ripple											
N	g_1	g_2	g_3	g_4	g_5	g_6	g_7	g_8	g_9	g_{10}	g_{11}
1	1.9953	1.0000									
2	3.1013	0.5339	5.8095								
3	3.3487	0.7117	3.3487	1.0000							
4	3.4389	0.7483	4.3471	0.5920	5.8095						
5	3.4817	0.7618	4.5381	0.7618	3.4817	1.0000					
6	3.5045	0.7685	4.6061	0.7929	4.4641	0.6033	5.8095				
7	3.5182	0.7723	4.6386	0.8039	4.6386	0.7723	3.5182	1.0000			
8	3.5277	0.7745	4.6575	0.8089	4.6990	0.8018	4.4990	0.6073	5.8095		
9	3.5340	0.7760	4.6692	0.8118	4.7272	0.8118	4.6692	0.7760	3.5340	1.0000	
10	3.5384	0.7771	4.6768	0.8136	4.7425	0.8164	4.7260	0.8051	4.5142	0.6091	5.8095

Source: Reprinted from G. L. Matthaei, L. Young, and E. M. T. Jones, *Microwave Filters, Impedance-Matching Networks, and Coupling Structures*, Artech House, Dedham, Mass., 1980, with permission.

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	In wireless ad-hoc network _____.
Option A:	Access point is not required
Option B:	Access point is must
Option C:	Nodes are not required
Option D:	All nodes are access points
2.	According to the specifications, how many Bluetooth devices can actively participate in a small network, called piconet?
Option A:	2
Option B:	9
Option C:	6
Option D:	8
3.	Which scheme implies the integer multiples of the first subcarrier, which are orthogonal to each other?
Option A:	OFDM
Option B:	BPSK
Option C:	QPSK
Option D:	QAM
4.	A scatternet is a collection of _____
Option A:	One master and slave
Option B:	Only master
Option C:	Piconets
Option D:	Only slaves
5.	Which mode enables peer-to-peer transmission between mobile units
Option A:	Mobile Adhoc Network mode
Option B:	LAN mode
Option C:	Infrastructure mode
Option D:	Adhoc mode
6.	Which transmission media provides the highest transmission speed in a network?
Option A:	Co-axial cable
Option B:	Twisted pair cable
Option C:	Optical cable
Option D:	Ethernet cable (CAT)
7.	The full form of SPIN is
Option A:	Sensor Protocol for Information via Negotiation
Option B:	Secrete Protocol for Information via Negotiation

Option C:	Simple Protocol for Information via Negotiations
Option D:	Sensor point for Information via Negotiations
8.	Each device in a MANET is -----to move independently in any direction and will therefore change its links to other devices frequently
Option A:	Restricted
Option B:	Free
Option C:	Bonded
Option D:	Need permission
9.	WiMAX uses licensed and unlicensed spectrum to deliver a.
Option A:	Point-to-point connection
Option B:	Point-to-multipoint connection
Option C:	Both P2P and P2MP
Option D:	None of these
10.	A true MANET requires ----- routing
Option A:	Multicast
Option B:	Unicast
Option C:	Broadcast
Option D:	Scattered

Q2	
A	Solve any Two 5 marks each
i.	<i>Define link types in Bluetooth</i>
ii.	<i>Explain Various WPAN sub standards in terms range, speed and IEEE Standards.</i>
iii.	<i>Describe the VANET network architecture.</i>
B	Solve any One 10 marks each
i.	<i>Explain SPIN and LEACH Protocols of wireless sensor networks in details.</i>
ii.	<i>Describe IEEE 802.11 equipment. Why is it preferable to use smaller packets in a WLAN environment?</i>

Q3	
A	Solve any Two 5 marks each
i.	<i>Explain the Routing protocols in Wireless Mesh Network</i>
ii.	<i>Explain in detail the three phases in Wireless Network planning process.</i>
iii.	<i>Explain with examples centralized and distributed schemes in localization of WSN nodes.</i>
B	Solve any One 10 marks each
i.	<i>Explain various Bluetooth connection establishment states. Draw a complete flow diagram.</i>
ii.	<i>Consider a Bluetooth piconet where a slave in piconet 1 is sending a packet to the master with DM3 packet format. What is the supported maximum rate of the user from slave to master direction? (DM3 packets are the same as that of DM1 except that they can cover up to threetime slots and can carry up to 123 infobytes and Atime slot period in Bluetooth is 625 MicroSeconds.)</i>

Q4	
A	Solve any Two Write short note on 5 marks each
i.	<i>M2M communication</i>
ii.	<i>VANET</i>
iii.	<i>MANET</i>
B	Solve any One 10 marks each
i.	<i>Explain Wireless Mesh Network and its applications</i>
ii.	<i>Explain Link(Uplink and Downlink) Budget for GSM.</i>

University of Mumbai
Examinations Summer 2022
ECCDLO 8044: Network Management in Telecommunication

Time: 2 hour 30 minutes

Max. Marks: 80

Q1. (20 Marks)	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks.
1.	The Web- Based Enterprise Management (WBEM) standard is developed by whom?
Option A:	DMTF (Desktop Management Task Force)
Option B:	ITU-T (International Telecommunication Union – Telecommunications)
Option C:	OSI (Open System Interconnection)
Option D:	IETF (Internet Engineering Task Force)
2.	What is FCAPS?
Option A:	Fault Management, Configuration Management, Accounting Management, Provisioning Management, System Management
Option B:	Filter Management, Console Management, Audit Management, Plagiarism Management, System Management
Option C:	Fault Management, Console Management, Audit Management, Provisioning Management, Security Management
Option D:	Fault Management, Configuration Management, Accounting Management, Provisioning Management, Security Management
3.	Two types of ATM switches are
Option A:	VPI and VCI
Option B:	VP and VPC
Option C:	PVC and SVC
Option D:	PVC and SUV
4.	Which of the transport protocol is used for communication over management process of SNMP?
Option A:	TCP
Option B:	UDP
Option C:	CMIP
Option D:	FTP

5.	The TMN information model has been used in specific technology such as _____ and _____.
Option A:	ATM and SDH/ SONET
Option B:	OSI and Mobile
Option C:	SNMP and broadband network
Option D:	IEEE and Satellite
6.	The management system correlates all these events and isolates the root cause of the problem. The technique is called----
Option A:	event correlation technique
Option B:	detecting and filtering of event
Option C:	model-based reasoning
Option D:	receiving an event
7.	Based on predefined policy of network management, controlling access to the network is the task of
Option A:	Fault management
Option B:	Performance management
Option C:	Active management
Option D:	Security management
8.	Service level agreement is between user & ----
Option A:	service provider
Option B:	IT manager
Option C:	Institute owner
Option D:	Employee
9.	For SNMP, _____ defines the general rules for naming objects, defining object types, and showing how to encode objects and values.
Option A:	SMI
Option B:	MIB
Option C:	BER
Option D:	IB
10.	An ATM cell has the payload field of

Option A:	32 bytes
Option B:	48 bytes
Option C:	64 bytes
Option D:	128 bytes

Q2 (20 Marks)	Solve any Two Questions out of Three	10 Marks each
A	Explain different perspective of Network Management.	
B	With respect to OSI Network Management describe terms as ACSE, ROSE, Scoping and Filtering Linked Replies, CMIS/ CMIP, GDMO	
C	You are administering the 24000 workstations in an organization. You are pinging each station periodically. The message size in both directions is 128 bytes long. The NMS you are using is on a 10Mbps LAN, which functions with 30% efficiency. What would be the frequency of your ping were if you were not to exceed 5% overhead?	

Q3 (20 Marks)	Solve any Two Questions out of Three	10 Marks each
A	Describe two-tier and three-tire network management organization model.	
B	Sketch and explain the TMN functional architecture.	
C	Describe Broadband Network Management?	

Q4.	Solve any Four out of Six	5 marks each
A	Explain about the network management architecture and organization.	
B	Illustrate the management information model	
C	Construct the Internet MIB II group.	
D	Differentiate RMON and SNMP	
E	Interpret the features of codebook correlation model with other models.	
F	What are the challenges/ Perspective of an IT Manager?	

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Kepler's second law is known as
Option A:	The Law of Orbits
Option B:	The Law of Areas
Option C:	The Law of Periods
Option D:	The Law of Gravity
2.	The quality of space link is measured in terms of _____ ratio.
Option A:	C/N
Option B:	S/N
Option C:	G/T
Option D:	EIRP
3.	What is meant by EIRP?
Option A:	Equivalent Isotropic Radiated Power
Option B:	Energy Isotropic Radiated Power
Option C:	Equivalent Isotropic Resonance Power
Option D:	Equivalent Intermodulated Radiated Power
4.	The distance of a Geo synchronous satellite from Earth's surface is _____ km.
Option A:	300
Option B:	10000
Option C:	35900
Option D:	5
5.	The satellite subsystem that monitors and controls the satellite is the
Option A:	propulsion subsystem
Option B:	power subsystem
Option C:	communications subsystem
Option D:	telemetry, tracking, and command subsystem
6.	At the beginning of each burst, certain time slots are used to carry timing & synchronization information, these time slots are collectively known as _____
Option A:	Preamble
Option B:	Guard time
Option C:	Frame efficiency
Option D:	Decoding quenching
7.	The point where the orbit crosses the equatorial plane going from north to south is called _____.
Option A:	Ascending node
Option B:	Descending node
Option C:	Line of nodes
Option D:	Line of apsides
8.	To make antenna more directional, either its size must be increased or
Option A:	the number of its feed horns must be increased
Option B:	the frequency of its transmission must be increased

Option C:	its effective isotropic radiated power (EIRP) must be increased
Option D:	its footprint must be increased
9.	DAMA stands for
Option A:	Data accessibility master aerial
Option B:	Digital attenuators microwave antenna
Option C:	Dual accessibility mode antenna
Option D:	Demand assigned multiple access
10.	The direct equivalence between noise factor and noise temperature:
Option A:	$T_e = (F + 1) T_0$
Option B:	$T_e = (F - 10) T_0$
Option C:	$T_e = (F - 1) T_0$
Option D:	$T_e = (F - 1) / T_0$

Please use either of the 3 option given below while setting up the subjective/descriptive questions

Q2	Solve any Four out of Six	5 marks each
A	Explain different orbital parameters.	
B	Define and explain reliability in satellite.	
C	Explain design considerations of Earth Station.	
D	What is EIRP and [G/T] ratio. For a satellite circuit the carrier-to-noise ratios are uplink 23dB, downlink 20dB, intermodulation 24 dB. Calculate the overall carrier- to-noise ratio in decibels.	
E	Compare: TDMA & FDMA.	
F	Explain GPS.	

Q3	Solve any Two Questions out of Three	10 marks each
A	Explain SPADE system.	
B	Derive satellite link budget equation.	
C	Explain VSAT.	

Q4		
A	Solve any Two	5 marks each
i.	State and explain Kepler's laws with the help of diagram.	
ii.	Explain input back off and output back off.	
iii.	Explain Laser satellite system.	
B	Solve any One	10 mark each
i.	Explain TT&C system with the help of block diagram.	
ii.	With the help of block diagram explain transmit receive type of earth station.	

University of Mumbai

Examinations summer 2022

Time: 2hour 30 minutes Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	_____describes the manner in which business is done to generate revenue and create value.
Option A:	Digital Business
Option B:	Business Model
Option C:	E-commerce
Option D:	CRM
2.	The _____ section of the business plan should be written last.
Option A:	financial statements
Option B:	executive summary
Option C:	Appendices
Option D:	Index
3.	_____ is a new digital ecosystem, which can be described through five Cs: creativity, connectivity, collaboration, convergence, & community.
Option A:	.NET
Option B:	Web 2.0
Option C:	IoT
Option D:	Webex
4.	Process of concealing the source of large amounts of money that have been gained through illegitimate means
Option A:	Bank Fraud
Option B:	Forgery
Option C:	Blackmail
Option D:	Money Laundering
5.	The primary source of financing during the early years of e-commerce was _____.
Option A:	Initial public offerings.
Option B:	Large retail firms.
Option C:	Bank loans.
Option D:	Venture capital funds.
6.	Mission statement and vision is the part of which Strategic Process.
Option A:	Formulation of Strategy
Option B:	Implementation of Strategy
Option C:	Evaluation of Strategy
Option D:	Internal Analysis Strengths weakness
7.	Which service encompasses all technologies used to transmit and process information on an across a network?
Option A:	Benchmarking
Option B:	Interoperability
Option C:	Scalability

Option D:	Web Services
8.	What is NOT a benefit of BYOD?
Option A:	Reduced costs.
Option B:	Viruses and security issues.
Option C:	Familiarity.
Option D:	Ownership.
9.	Which Of The Following Factors Can Impact The Open Rate Of Your Email Campaigns?
Option A:	The chance for customers to opt-out
Option B:	The number of pictures in your email
Option C:	The subject line of the email
Option D:	The number of links contained in the email
10.	A “glue” between client and server parts of application.
Option A:	Middleware
Option B:	System Software
Option C:	Package
Option D:	Firmware

Q2	Solve any Four out of Six	5 marks each
A	Discuss different drivers of digital business management.	
B	Explain different factors that affect consumer behavior	
C	Explain Firewall as Security Control	
D	Discuss various Legal, Ethics and Societal impacts of E-commerce	
E	State and Explain opportunities & Challenges in Digital Business?	
F	Compare & contrast physical Economy with Digital Economy?	

Q3.		
A	Solve any Two out of Three	5 marks each
i.	Discuss various security issues related to E-commerce?	
ii.	What are the types of E-Commerce models?	
iii.	Explain process of Digital Transformation	
B	Solve any One	10 mark each
i.	Explain the components of Business plan document in e-business.	
ii.	Explain Analysis of Company’s Internal and External environment	

Q4.		
A	Solve any Two out of Three	5 marks each
i.	What is Information System? Explain its Components?	
ii.	Components of E-SCM	
iii.	Short note on Mobile Commerce	
B	Solve any One	10 mark each
i.	Explain Digital Signature. Explain its importance in Digital Business.	
ii.	Explain ERP and its components.	