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 fc= 2 GHz ,impedance of 50 Ω 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 λ/8 line in Richard's transformation.
Option A	Short stub and open stub
Option B	Shunt capacitor and series indctor
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 90^0 hybrid coupler with neat diagram.
B	Solve any one 10 marks each
i	A GaAs FET has the following scattering and noise parameters at 4 Ghz measured with 50 Ω system $S_{11} = 0.6 \angle -60^0$ $S_{12} = 0.05 \angle -26^0$, $S_{21} = 1.9 \angle 81^0$, $S_{22} = 0.5 \angle -60^0$,Fmin=1.6dB, Rn = 20 Ω and Γ opt $= 0.62 \angle 100^0$ Assuming the FET to be unilateral .design an amplifier for maximum possible gain and noise figure not more than 2dB.
ii	Design a composite low pass filter by image parameter method for following specifications $R_o = 50\ \Omega$ f_c=50 MHz. $f_\infty = 52$ 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 Ωload ondrain side$S_{11} = 0.9 \angle -150^0$, $S_{12} = 0.2 \angle -15^0$, $S_{21} = 2.6 \angle 50^0$, $S_{22} = 0.5 \angle -105^0$ .Calculate and plot stabilitycircles and choose Γt for Γin>> 1.Design load terminating network
ii	An N= 3 Chybyshev 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 Ωcharacteristicline 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 Ωnetwork analyzer at 6 GHz $S_{11} = 0.6\ 14 \angle -167.4^0$, $S_{12} = 0.046 \angle 65^0$, $S_{21} = 2.18 \angle 32.4^0$, $S_{22} = 0.716 \angle -83^0$ Design an amplifier using this for maximum possible gain
ii	A one port oscillator uses a negative resistance diode having Γin =1.25 ∠40 Zo=50 Ωat its desired operating point for f= 6GHz .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.

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

Q3	
A	**Solve any Two** **5 marks each**
i.	*Explain the Routing protocols in Wireless Mesh Network*
ii.	*Explain in detail the three phases in Wireless Network planning process.*
iii.	*Explain with examples centralized and distributed schemes in localization of WSN nodes.*
B	**Solve any One** **10 marks each**
i.	*Explain various Bluetooth connection establishment states. Draw a complete flow diagram.*
ii.	*Consider a Bluetooth piconet where a slave in piconet 1 is sending a packet to the masterwith 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.*)*

Q4	
A	**Solve any Two** **Write short note on5 marks each**
i.	*M2M communication*
ii.	*VANET*
iii.	*MANET*
B	**Solve any One** **10 marks each**
i.	*Explain Wireless Mesh Network and its applications*
ii.	*Explain Link(Uplink and Downlink) Budget for GSM.*

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

Time: 2 hour 30 minutes Max. Marks: 80

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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?

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Examinations Summer 2022

Time: 2 hour 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.	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:	Te= (F +1) T_0
Option B:	Te= (F -10) T_0
Option C:	Te= (F-1) T_0
Option D:	Te= (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.

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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**
1.	The 'T' in a PESTLE analysis refers to,
Option A:	Technology
Option B:	Time
Option C:	Training
Option D:	Task
2.	BCG matrix is also referred as,
Option A:	Growth-sell matrix
Option B:	Business-cost matrix
Option C:	Growth-Share Matrix
Option D:	Business-share matrix
3.	The entrepreneur who has neither the will nor the desire to introduce and adopt new methods is called as,
Option A:	imitating entrepreneur
Option B:	adoptive entrepreneur
Option C:	fabian entrepreneur
Option D:	innovative entrepreneur
4.	Combining of two or more businesses to try and achieve synergy to achieve more overall gains is referred as,
Option A:	Merger Deal
Option B:	Team Building
Option C:	Franchise Setup
Option D:	Partnership Deal
5.	To convince a financial entity and an angel investor that the business can produce enough revenue to make a satisfactory profit and therefore attractive as an investment opportunity is called as,
Option A:	Future plan
Option B:	Profit-loss statement
Option C:	Balance statement
Option D:	Business plan
6.	The three pillars of sustainable development for the entrepreneurial ecosystem are
Option A:	Environment , Economy, Society
Option B:	Ecology, Economy, Society
Option C:	Environment , Ecology, Equity
Option D:	Equity, Environment , Society

7.	Which of the following is the responsibility of the government when it is in promotional role for encouraging entrepreneurship
Option A:	Build up and strengthen the necessary development infrastructures such as power, transport, finance, marketing, institutions for training and guidance.
Option B:	It should see to it that the national resources are directed to the right purpose.
Option C:	Set up State Owned Enterprises (SOEs)
Option D:	Encourage or Discourage certain activities through monetary and fiscal incentives and disincentives
8.	As per MSME, the investment in plant and machinery under manufacturing sector does not exceed ---- and in equipment under service sector does not exceed ----.
Option A:	5 Lakhs - 10 Lakhs
Option B:	10 Lakhs -15 Lakhs
Option C:	25 Lakhs - 10 Lakhs
Option D:	50 Lakhs - 10 Lakhs
9.	What is not the characteristics of PPP's
Option A:	Focuses of goods
Option B:	Resources
Option C:	Sharing
Option D:	Continuity
10.	Trademarks relate to _____.
Option A:	Practice and knowledge acquired through experience
Option B:	The protection of proprietary information of commercial value
Option C:	The right to reproduce one's own original work
Option D:	Brand identity

Q2.	**Attempt any Two out of Three** **(10 marks each)**
A	What do you mean by a business plan? Explain the issues to be addressed in a business plan?
B	Write a note on the various initiatives by GOI for women entrepreneurs.
C	Give the impact on the marketing aspects of a product by entrepreneur by the use of Digital Marketing

Q3.	**Attempt any Two out of Three** **(10 marks each)**
A	Explain the process of closing your business?
B	What are the functions of an entrepreneur in entrepreneurial development?
C	What are the Four types of firm level growth strategy?

Q4.	**Attempt any Two out of Three** **(10 marks each)**
A	Explain the steps on harvesting or closing small business.
B	Note on Capital and its importance to entrepreneur.
C	State the Importance of MSME's towards national growth.