ME SEM-II /MIPC

University of Mumbai

Examinations Summer 2022

Master of Engineering

Course: Modern Digital Communication (ETC201)

Time: 2 hour 30 minutes Max. Marks: 80

Q1.	**Choose the correct option for the following questions. All the questions are compulsory and carry equal marks**
1.	The smaller the cross-correlation, the _____ is the distance between the signal vec
Option A:	Less
Option B:	More
Option C:	Double
Option D:	Half
2.	In non-uniform quantization, the quantization noise is _____ to signal size.
Option A:	Directly proportional
Option B:	Double
Option C:	Half
Option D:	Inversely proportional
3.	Which is easier to implement and is preferred?
Option A:	Coherent
Option B:	Non-Coherent
Option C:	Both Coherent and non-coherent
Option D:	Depends on application
4.	For N symbol inputs, LMS algorithm requires --- operations per iterations ___
Option A:	2N
Option B:	N+1
Option C:	2N+1
Option D:	N/2
5.	For AWGN, the noise variance is
Option A:	No
Option B:	No/2
Option C:	2No
Option D:	No/8
6.	Matched filter may be optimally used for
Option A:	Gaussian noise
Option B:	Flicker
Option C:	Transit time noise
Option D:	Internal noise
7.	For M equally likely messages, R>C, probability of error is
Option A:	Zero
Option B:	Close to unity
Option C:	Infinite
Option D:	Double
8.	The average power of white noise is

Option A:	Infinity
Option B:	Zero
Option C:	Can't say
Option D:	one
9.	In an orthogonal signal, all cross-correlation coefficients are
Option A:	One
Option B:	Zero
Option C:	Multiples of each other
Option D:	Equal
10.	The detection method where the carrier's phase is given importance is called as
Option A:	Coherent
Option B:	Non-Coherent
Option C:	Both Coherent and non-coherent
Option D:	Depends on application

Q.2	**Solve any Two Questions out of Three** **10 marks each**
A	Explain the design of bandlimited signals with controlled ISI
B	Explain optimum MFSK receiver
C	Write a note on the KL expansion approach

Q.3	**Solve any Two Questions out of Three** **10 marks each**
A	Write a note on Spatial Waveform Coding
B	Explain Whitening approach
C	Explain in detail the optimum receiver in Rayleigh channels

Q.4	
A	**Solve any Two** **5 marks each**
i.	Explain the types of small-scale fading
ii.	Write a note on the linear equalizer
iii.	Write a note on the LMS algorithm
B	**Solve any One** **10 marks each**
i.	Explain the Lempel algorithm in detail
ii.	Write a note on Bayes detection of the received signal

University of Mumbai
Examination First Half 2022
Paper Code: 94700
Program: **Electronics & Telecommunication**
Curriculum Scheme: Rev 2016
Examination: ME Semester II
Course Code: 34002 Course Name: / Wireless Adhoc & Sensor Networks
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.	A routing protocol sets up a routing table in……..
Option A:	Gateway
Option B:	Routers
Option C:	Bridges
Option D:	Hubs
2.	Major technologies of WPAN are
Option A:	Bluetooth
Option B:	GSM
Option C:	ZigBee
Option D:	Both A & C
3.	Flooding is a….
Option A:	Reactive technique
Option B:	Duplicate message that are sent
Option C:	Proactive technique
Option D:	Duplicate message that can be avoided
4.	In which routing protocol router knows entire network topology and computes shortest path
Option A:	Link State Routing
Option B:	Cluster head Gateway Switch Routing
Option C:	Ad-hoc on-demand distance vector
Option D:	Dynamic source routing
5.	In Ingredient Heterogeneous network which basic component move arbitrarily
Option A:	BSs
Option B:	APs
Option C:	MH
Option D:	CN
6.	Bluetooth link support the following links
Option A:	SCO
Option B:	ACL
Option C:	SCO or ACL
Option D:	SCO & ACL

7.	Infrastructure mesh network consist of
Option A:	Less/minimal mobility routers
Option B:	High mobility routers
Option C:	Mobile client
Option D:	Fixed routers
8.	The SMACS is an infrastructure building protocol that forms ----topology
Option A:	Mesh
Option B:	Tree
Option C:	Flat
Option D:	Bus
9.	Most widely used transport protocol
Option A:	UDP
Option B:	TCP
Option C:	HTTP
Option D:	NNTP
10.	Wireless Sensor network are used when
Option A:	Having limited power
Option B:	Unlimited power
Option C:	Network topology changed very frequently
Option D:	Network topology does not changed

Q2 (20 Marks)	**Solve any Four out of Six** **5 marks each**
A	Explain in brief factors affect TCP performance in MANET
B	Write the similarities and dissimilarities between AODV & DSR
C	Explain in brief Nano Sensor network
D	List and explain the characteristics and Challenges of MANET.
E	Write short notes Voronoi Diagram
F	Compare Hierarchical versus Flat topologies

Q3 (20 Marks)	**Solve any Two Questions out of Three** **10 marks each**
A	What is Broadcast Storm? Explain Broadcast Storm problem with example.
B	Explain Self –Organizing MAC for sensor network (SMACS)
C	Explain Body area network (BAN) with suitable architecture

Q4 (20 Marks)	**Solve any Two Questions out of Three** **10 marks each**
A	Draw and explain Heterogeneous Network Architecture
B	List out various tree based multicast routing protocols. Explain adhoc multicast routing protocols Utilizing increasing Id Numbers (AMRIS).
C	Explain LEACH Protocol in detail

ME SEM II / RF & ME / EXTC

9r480

University of Mumbai

Examination: Summer 2022

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: **Rev2016**

Examination: **ME** Semester: **II**

Course Code: **ETC203** Course Name: **RF and Microwave Engineering**

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.	**For the capacitors used in MMICs, the insulating dielectric films used are _____.**
Option A:	Air
Option B:	SiO
Option C:	Titanium
Option D:	GaAs
2.	**The substrate of an MMIC must be a _____ to accommodate the fabrication of all the type of devices.**
Option A:	Semiconductor
Option B:	Insulator
Option C:	Partial conductors
Option D:	Metals operable at high frequencies
3.	**Electromagnetic Interference can intentionally be used for _____, as in electronic welfare.**
Option A:	Electrostatic coupling
Option B:	Electrostatic induction
Option C:	Radio jamming
Option D:	Electrostatic discharge
4.	**_____ is a nonlinear circuit that converts DC power to an AC waveform of desired frequency.**
Option A:	Attenuator
Option B:	Amplifier
Option C:	Oscillator
Option D:	LNA
5.	**If a power amplifier has an output power of 10W and an amplifier gain of 16.4 dB then the input drive power is _____.**
Option A:	400 mW
Option B:	225 mW
Option C:	229 mW
Option D:	240 mW

6.	**A SiGe HBT device has the following scattering parameters at 4.0 GHz: $S_{11} = 0.6 \angle -60°$, $S_{12} = 0.05 \angle 26°$, $S_{21} = 1.9 \angle 81°$, $S_{22} = 0.5 \angle -60°$. If the device is assumed to be unilateral for design purposes, which of the following statement is valid with respect to the error that would be introduced?**
Option A:	This device would introduce a large error and hence cannot be assumed as a unilateral one
Option B:	The error introduced is within the acceptable range of ±0.5 dB and hence the device can be assumed to be unilateral
Option C:	Absolutely no error is introduced
Option D:	Error cannot be computed for this device
7.	**S parameters are expressed as a ratio of _____.**
Option A:	Voltage and current
Option B:	Impedance at different ports
Option C:	Incident and the reflected voltage waves
Option D:	Power and voltage
8.	**Scattering matrix for a lossless matrix is _____.**
Option A:	Unitary
Option B:	Symmetric
Option C:	Identity matrix
Option D:	Null matrix
9.	**The major advantage of single stub tuning over other impedance matching techniques is _____.**
Option A:	Distributed elements are avoided
Option B:	Lumped elements are avoided
Option C:	No fabrication as a part of transmission line media is needed
Option D:	It involves more adjustable parameters
10.	**The mode of propagation in a microstrip line is _____.**
Option A:	TEM mode
Option B:	TE mode
Option C:	Quasi TEM mode
Option D:	TM mode

Q2. (20 Marks)	**Solve any Two Questions out of the Three** **10 marks each**
A	Distinguish between One port and Two port Oscillators. For a two port oscillator at steady state oscillation, prove that if $\Gamma_L.\Gamma_{in} = 1$ then $\Gamma_T.\Gamma_{out} = 1$.
B	With a neat labelled diagram explain strip lines in microwave engineering. Discuss the applications of the same.

C	Define stability of a microwave amplifier. Explain the graphical and analytical method to determine the stability of any microwave amplifier.

Q3. (20 Marks)	**Solve any Two Questions out of Three** **10 marks each**
A	A BJT has the following *S*-parameters as a function of three frequencies. Determine in which of these cases, device is unconditionally stable, and which has greatest stability?

frequency (MHz)	S_{11}	S_{12}	S_{21}	S_{22}
500	$0.34 \angle -170°$	$0.06 \angle 70°$	$4.3 \angle 80°$	$0.45 \angle -25°$
750	$0.75 \angle -60°$	$0.2 \angle 70°$	$5.0 \angle 90°$	$0.51 \angle 60°$
1000	$0.65 \angle -140°$	$0.04 \angle 60°$	$2.4 \angle 50°$	$0.7 \angle -65°$

B	List the characteristics of Microwave signals. Draw the block diagram of a microwave system, explaining its advantages, disadvantages and applications.
C	What are the properties and characteristics of substrate and conductor materials used in MMIC? Write the advantages and applications of MMICs.

Q4. (20 Marks)	**Solve any Two Questions out of Three** **10 marks each**
A	What are the different radiators distinguished by FCC for the regulations limiting RF emissions? Considering the case of one transmitter and one receiver explain with the help of a diagram the interference that may propagate via different paths.
B	Design an L-section matching network to match a series RC load with an impedance, $Z_L = 200 - j100\ \Omega$ to a $100\ \Omega$ line, at a frequency of 500 MHz.
C	What are microwave mixers? Explain different types of microwave mixers.

ME(EXTC)/SEM-II/Satellite Networking

University of Mumbai
Paper Code- 34004/Satellite Networking
Examination Summer 2022
Examination Commencement from 28th June to 6th July 2022
Program: ME EXTC
Choice-Based Credit Grading System

Time: 2 hours and 30 minutes Max. Marks: 80

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Q1.	Choose the correct option for the following questions. All the questions are compulsory and carry equal marks
1.	INTELSAT stands
Option A:	International Telecommunications Satellite
Option B:	India Telecommunications Satellite
Option C:	Inter Telecommunications Satellite
Option D:	Intra Telecommunications Satellite
2.	Kepler's first law states
Option A:	The path followed by a satellite around the primary will be an ellipse
Option B:	The path followed by a satellite around the primary will be an circle
Option C:	The path followed by a satellite around the primary will be an sphere
Option D:	No path is followed
3.	KU band uplink frequency range
Option A:	4.7-4.2GHz
Option B:	14-14.5GHz
Option C:	3.7-4.2MHz
Option D:	5.9-6.4MHz
4.	The carrier to noise ratio for a satellite depends upon
Option A:	Effective Isotropic Radiated power
Option B:	Solar Cell
Option C:	Repeater
Option D:	Transponder
5.	What type of satellite TV service uses compressed data transmission to beam signals directly to every home
Option A:	Fixed satellite service
Option B:	Broadcasting satellite service
Option C:	Mobile satellite service
Option D:	Direct broadcast satellite
6.	The quality of a space link is measured in terms of the _____ ratio.
Option A:	C/N
Option B:	S/N
Option C:	G/T
Option D:	EIRP

Option C:	Control systems include maintaining accurate satellite speed throughout the life span of the system.
Option D:	Control systems include maintaining accurate satellite position throughout the life span of the system
8.	With reference to satellite communication, the anti-jamming technique preferred
Option A:	key leverage
Option B:	Frequency hopping
Option C:	Once-only key
Option D:	Frequency-spectrum modulation
9.	Which of the following factor does NOT contribute to the drift of a geostationary satellite from its stationary position in space?
Option A:	The pressure of solar radiations
Option B:	Gravitational changes due to Sun and Moon
Option C:	The oblateness of the Earth
Option D:	Weight of the satellite
10.	TV broadcast via satellite the TV signal from the main broadcast station is routed to the earth station via
Option A:	Transmitting station and a receiving station
Option B:	One transmitting station and a receiving station
Option C:	Many transmitting stations and many receiving stations
Option D:	Point-to-point Communication

Q2 (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	Draw and explain the launching mechanism of the satellite in geostationary orbit
B	Explain the Link power budget Analysis of Satellite
C	Draw and explain Satellite Network Architecture

Q3 (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	i. Explain the Equipment Reliability and space qualification ii. What do you understand by single-hop multi-hop satellite connection
B	Draw and explain Optical Satellite Link Transmitter
C	Explain IRIDIUM and GLOBALSTAR satellites with their applications

Q4 (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	State the significance of TT&C mechanisms used for satellite? Explain in detail each
B	Explain window organization with three beams in satellite switched TDMA techniques of connectivity.
C	Explain various satellite .applications in Earth observation

University of Mumbai

Program: ME Electronics and Telecommunication Engineering
Curriculum Scheme: Revised 2016 (CBCGS)
Examination: ME Semester II
Course Code and Course Name: **Network & Cyber Security (ETDLO2022)**
Time: 2Hrs. & 30 Min Max. Marks: 80

Q1.	Which of these uses Public Key Infrastructure (PKI) and digital certificates to provide privacy and authentication?
Option A:	SSL
Option B:	DES
Option C:	SET
Option D:	TLS
Q2.	In cryptography, the order of the letters in a message is rearranged by _____
Option A:	substitution ciphers
Option B:	transpositional ciphers
Option C:	both transpositional ciphers and substitution ciphers
Option D:	quadratic ciphers
Q3.	What are the different ways to classify an IDS?
Option A:	Zone based
Option B:	Host & Network based
Option C:	Network & Zone based
Option D:	Level based
Q4.	In _____ attack the attacker sends a large number of connection or information request to the target
Option A:	Denial of Service
Option B:	Virus
Option C:	Worm
Option D:	Bot
Q5.	Which of the following refers to exploring the appropriate, ethical behaviors related to the online environment and digital media platform?
Option A:	Cyber low
Option B:	Cybersecurity
Option C:	Cybersafety
Option D:	Cyberethics
Q6.	Copyrights, Trademarks, Patents, and Trade Secrets are the types of
Option A:	NOC

Option B:	IDS
Option C:	SOC
Option D:	IPR
Q7.	What is the size of the RSA signature hash after the MD5 and SHA-1 processing?
Option A:	42 bytes
Option B:	32 bytes
Option C:	36 bytes
Option D:	48 bytes
Q8.	Which of the following is a Wireless traffic Sniffing tool?
Option A:	Maltego
Option B:	BurpSuit
Option C:	Nessus
Option D:	Wireshark
Q9.	In the DES algorithm the round key is _____ bit and the Round Input is _____bits.
Option A:	48,32
Option B:	64,32
Option C:	56, 24
Option D:	32, 32
Q10.	Which is the act that provides legal frame work for e-governance in India
Option A:	IT(amendment) act 2008
Option B:	IT Act 2000
Option C:	Indian Penal Code
Option D:	The Indian Evidence Act ,1872
Que 2.	**Solve any two out of three** **(10 marks each)**
A	What are Firewall and IDS? Differentiate between firewall and IDS
B	What is risk management? Describe the risk control strategies.
C	Describe the key generation/expansion processes of Data Encryption Standard and Advanced Encryption Standard.
Que3.	**Solve any two out of three** **(10 marks each)**
A	Classify the cybercriminals and explain how cybercriminal plan the attack.
B	Brief about Security Operations Center and Network Operations Center and compare the same
C	What are Active and Passive attacks? List various Active and Passive Attacks and Compare the Active and Passive attacks.
Que 4.	**Solve any two out of three** **(10 marks each)**
A	Explain various Intellectual Property Rights
B	What is Biometric Security? List the Biometric techniques and discuss anyone in detail
C	Explain how IPSec provides data security at the IP packet level.

University of Mumbai

Examinations Summer 2022

Time: 2hour 30 minutes

Paper-code-95711

Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The objective of research is
Option A:	To determine the frequency with which something occurs or with it is associated with something else.
Option B:	To become familiar with a phenomenon.
Option C:	To test a hypothesis of a causal relationship between variables.
Option D:	All of the above
2.	A hypothesis is a
Option A:	Supposition which is based on the past experiences
Option B:	Statement of fact
Option C:	Tentative statement whose validity is still to be tested
Option D:	None of the above
3.	Final stage in the Research Process is
Option A:	Problem formulation
Option B:	Data collection
Option C:	Data Analysis
Option D:	Report Writing
4.	Which of the following is the first step in a research process?
Option A:	Selecting a topic
Option B:	Formulating research problem
Option C:	Development of a hypothesis
Option D:	Report writing
5.	What is the need for conducting research
Option A:	Extension of knowledge
Option B:	Verify and test the existing facts and theories
Option C:	Promote progress in the society
Option D:	All of the above
6.	Which of the following is not a part of skimming
Option A:	Reading the title, keyword & abstract
Option B:	Checking out the length of the paper
Option C:	Finding out the author's origin country
Option D:	Finding out where it is published
7.	_____ is an optional part of the research paper.
Option A:	Title
Option B:	Acknowledgment
Option C:	Abstract
Option D:	References

8.	The goals of the paper should be
Option A:	To allow others to reproduce your results
Option B:	To persuade people of the approach
Option C:	Both A & B
Option D:	None of the above
9.	To formulate the objective of the study one should
Option A:	List the objectives
Option B:	List the assumptions
Option C:	List the limitations of the study
Option D:	All of the above
10.	_____ is not a type of research article
Option A:	Review paper
Option B:	Full-length article
Option C:	Microarticle
Option D:	Macroarticle

Q2.	**Answer any Four Questions out of Six** **(5 marks each)**
A	Discuss the concept of skimming a research paper before selecting it for reading.
B	Explain Research Methods and Research Methodology?
C	What is the function of a hypothesis?
D	What is the structure of a research paper?
E	List the goals of a research paper?
F	Discuss the minimum requirements for creating a Research design?

Q3.	**Answer any Two Questions out of Three** **(10 marks each)**
A	What are some of the problems encountered by researchers?
B	Explain how to do a literature review for any research work?
C	List and explain the different types of research articles?

Q4.	**Answer any Two Questions out of Three** **(10 marks each)**
A	Explain the approach to reading a research paper.
B	Discuss some points which you will consider before selecting any journal for publication?
C	What are the different steps involved in writing a research paper?