University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Rev-2016

Examination: TE Semester V

Course Code: ECC501 and Course Name: Microprocessor and Peripherals Interfacing

Time: 2 hour 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.	A computer program that translates high level programming language code to machine level code is --------.
Option A:	Assembler
Option B:	Compiler
Option C:	Interpreter
Option D:	Converter
2.	8086 microprocessors can access -------- IO ports.
Option A:	16K
Option B:	8K
Option C:	32K
Option D:	64K
3.	8086 microprocessor has -------- byte prefetch queue in bus interface unit.
Option A:	6
Option B:	4
Option C:	3
Option D:	2
4.	Memory Segmentation permits the programmer to access 1MB memory using only --------- bit address.
Option A:	8
Option B:	16
Option C:	32
Option D:	20
5.	Which flag is set/reset for auto incrementing/decrementing modes of SI and DI during string operations in an 8086 microprocessor?
Option A:	DF
Option B:	OF
Option C:	IF
Option D:	TF
6.	The result of MOV AL, 58 --------.
Option A:	store 0101 1000 in AL
Option B:	store 58 H in AL
Option C:	store data from memory 58 to AL

Option D:	store 0011 1010 in AL
7.	The instruction that loads an effective address formed by destination operand into the specified source register is -------.
Option A:	LEA
Option B:	LDS
Option C:	LES
Option D:	LAHF
8.	Which of the following instructions gives 2's complement of the number?
Option A:	DAA
Option B:	NEG
Option C:	DAS
Option D:	CMP
9.	How many channels are present in one DMA Controller IC 8257?
Option A:	2
Option B:	4
Option C:	6
Option D:	8
10.	In control word format of 8254, if RL1=1, RL0=1 then the operation performed is
Option A:	read/load least significant byte only
Option B:	read/load most significant byte only
Option C:	read/load LSB first and then MSB
Option D:	read/load MSB first and then LSB
11.	How many ICW (Initialization Command Word) are present in 8259?
Option A:	2
Option B:	4
Option C:	6
Option D:	8
12.	Which of the following is a bidirectional I/O mode in 8255?
Option A:	Mode 0
Option B:	Mode 1
Option C:	Mode 2
Option D:	BSR
13.	Exit Condition for LOOP instruction is --------.
Option A:	AX = 0000H
Option B:	BX=0000H
Option C:	CX=0000H
Option D:	DX=00000H
14.	Instruction Queue is used for --------.
Option A:	Pipelining
Option B:	Memory Segmentation
Option C:	Memory Banking
Option D:	Memory Interfacing

15.	The function of S5 pin is to --------.
Option A:	Give status of Interrupt Enable Flag
Option B:	Give status of Trap Flag
Option C:	Give status of Direction Flag
Option D:	Give status of Sign Flag
16.	The time taken by the ADC from the active edge of SOC pulse till the active edge of EOC signal is referred as --------.
Option A:	Conversion delay
Option B:	Settling time
Option C:	Take off time
Option D:	output time
17.	In ADC, the ALE is used to____.
Option A:	start conversion
Option B:	stop conversion
Option C:	provide clock
Option D:	Latch Channel number
18.	Which of the following signals is used to select the ODD memory bank in 8086?
Option A:	ALE
Option B:	Active low BHE
Option C:	A0
Option D:	MEMR
19.	How many address lines a memory chip of 1K capacity will have?
Option A:	8
Option B:	10
Option C:	11
Option D:	12
20.	The BUSY signal of 8087 is connected with -------- pin of 8086.
Option A:	TEST
Option B:	HOLD
Option C:	INTR
Option D:	QS0

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	Write a Program to find strength of Positive and Negative numbers among the series of 10 signed numbers.
B	Explain the Interrupt structure of 8086 Microprocessor.
C	Explain Various operating modes of 8255 PPI.

Q3.	
A	**Solve any Two** **5 marks each**
i.	Explain the instruction pipelining features of 8086. Give its advantages and its disadvantages.
ii.	Explain the need of assembly language and compare with high level languages.
iii.	If 16k RAM (2 chips of 8k each) are interfaced with 8086.Assuming that physical address of RAM is 00000H,what will be the starting and ending address of each chip?
B	**Solve any One** **10 marks each**
i.	Explain Maximum Modes of 8086 Microprocessor. Draw timing diagram for Read operation in maximum Mode.
ii.	Draw and explain the interfacing of DAC 0809 with 8086 microprocessor using 8255. Also write an assembly language program to generate square wave.

University of Mumbai

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Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Rev-2016

Examination: TE Semester V

Course Code: ECC501 and Course Name: Microprocessor & Peripherals Interfacing

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	D
Q3.	A
Q4	B
Q5	A
Q6	D
Q7	A
Q8.	B
Q9.	B
Q10.	C
Q11.	B
Q12.	C
Q13.	C
Q14.	A
Q15.	A
Q16.	A
Q17.	D
Q18.	B
Q19.	B
Q20.	A

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: Electronics & Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester: V

Course Code: ECCDLO5012 and Course Name: TV & Video Engineering

Time: 2-hour 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.	How much is the vertical blanking period in television system?
Option A:	1280µs
Option B:	1150µs
Option C:	1580µs
Option D:	1296µs
2.	The frequency difference between sound carrier and picture carrier is___.
Option A:	1.5MHz
Option B:	2.5MHz
Option C:	4.5MHz
Option D:	5.5MHz
3.	Which video compression standard is also known as High Efficiency Video Coding or MPEG-H Part-2?
Option A:	H.262
Option B:	H.264
Option C:	H.265
Option D:	H.261
4.	Compatibility implies that:
Option A:	The color television signal must produce a normal black and white picture on a monochrome receiver without any modification of the receiver circuitry.
Option B:	The monochrome signal must produce a normal black and white picture on a color receiver without any modification of the receiver circuitry.
Option C:	The monochrome signal must produce a color picture on a color receiver without any modification of the receiver circuitry.
Option D:	The color television signal must produce a color picture on a color receiver without any modification of the receiver circuitry.
5.	Which of the communication protocol is applicable to IPTV?
Option A:	RTP
Option B:	SMTP
Option C:	TCP/IP
Option D:	HTTP
6.	The colour subcarrier frequency in the NTSC system has been chosen to have an exact value equal to _____ MHz.

Option A:	3.574595
Option B:	3.597545
Option C:	3.579545
Option D:	3.559745
7.	According to digital component studio standard the scanning frequency for luminance and chrominance signals are 13.5MHz and 6.75MHz but for the compression purpose, what is the common sampling rate used to read?
Option A:	20.75 MHz
Option B:	25.75 MHz
Option C:	20.25 MHz
Option D:	30.25 MHz
8.	Which of the following is not an advantage of LED TV?
Option A:	Less power
Option B:	Brighter display with better contrast
Option C:	Lesser heat dissipation
Option D:	Thicker panel
9.	What will be the percentage interlace error if there is 16μs delay in the start of the second field?
Option A:	25%
Option B:	50%
Option C:	75%
Option D:	100%
10.	Which of the following is not a part of Image Orthicon camera tube?
Option A:	Image section
Option B:	Current mirror section
Option C:	Scanning section
Option D:	Multiplier section
11.	Colour burst signal is sent during which of the following interval?
Option A:	Front Porch
Option B:	Vertical Blanking
Option C:	Back Porch
Option D:	Active line
12.	Which of the following statement is not true about the chromaticity diagram?
Option A:	It is a horse shoe shaped triangular diagram.
Option B:	Saturated pure spectral colours are represented along the perimeter of the diagram.
Option C:	The three corners represent complementary colours.
Option D:	White colour is located at the centre point of the chromaticity diagram.
13.	Which of the following is the invalid statement for NTSC system?
Option A:	The I-signal is along the reddish orange and bluish green axis.
Option B:	I signal passed through 1.5MHz filter.
Option C:	Q signal is passed through 0.5MHz filter.
Option D:	Y signal is passed through 7MHz filter.

14.	Which of the following is not a Chroma sub-sampling scheme?
Option A:	4:4:4
Option B:	4:2:2
Option C:	4:1:1
Option D:	4:2:3
15.	Which of the following is not a type of digital TV?
Option A:	SDTV
Option B:	EDTV
Option C:	CCTV
Option D:	HDTC
16.	Select the incorrect one form of DVB standard from the following:
Option A:	DVB-H—Digital Video Broadcasting-Handheld
Option B:	DVB-S—Digital Video Broadcasting-Satellite
Option C:	DVB-C—Digital Video Broadcasting-Cable
Option D:	DVB-E—Digital Video Broadcasting-Enhance
17.	Which of the following TV uses Quantum Dot technology?
Option A:	UHD
Option B:	LED
Option C:	SUHDTV
Option D:	HDTV
18.	Which of the following is not a correct characteristic of D2-MAC?
Option A:	Lines with video signal-24 to 310 and 336 to 622
Option B:	interlace ratio is 2:1
Option C:	Samples for luminance - 697
Option D:	Samples for chrominance - 457
19.	The elements of CCTV system are____
Option A:	video camera, video switcher, TV monitor, coaxial cables
Option B:	video camera, programming source, broadcaster, fiber optic cable
Option C:	video camera, splitter, set top box, TV
Option D:	video camera, modulator, sync separator, TV monitor
20.	Which of the following is not available as connectivity option in Chromecast device?
Option A:	HDMI
Option B:	RCA
Option C:	Ethernet
Option D:	Wi-Fi

Option 1

Q2 **(20 Marks)**	**Solve any Four out of Six** **5 marks each**
A	Draw and explain channel bandwidth for PAL television system.
B	Justify the choice of a rectangular frame with width to height ratio = 4/3 for TV transmission & reception.
C	With the help of a relevant diagram explain colour circle or colour wheel.
D	Draw D2-MAC packet format/signal and state characteristics of D2-MAC.
E	What is a Set-Top-Box? Draw its block diagram and explain its operation in brief.
F	Write short note on Satellite Television.

Q3. **(20 Marks)**	**Solve any Four out of Six** **5 marks each**
A	Draw and explain electron multiplier section in image orthicon camera tube.
B	Explain the terms:-- ii. Additive mixing ii. Luminance, Hue and Saturation
C	Mention the time period allotted for following elements of Composite Video Signal: i) Vertical Sync Pulse ii) Active Line Period iii) Horizontal Retrace Period iv) Front Porch v) Back Porch
D	Write short note on Ultra High Definition and 4K format.
E	List important features of DVB-T and DVB-T2 standards.
F	Compare LED and LCD type of television displays.

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Program: Electronics & Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ECCDLO5012 and Course Name: TV & video Engineering

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option
Q1.	A
Q2.	D
Q3.	C
Q4	A
Q5	A
Q6	C
Q7	C
Q8.	D
Q9.	B
Q10.	B
Q11.	C
Q12.	C
Q13.	D
Q14.	D
Q15.	C
Q16.	D
Q17.	C
Q18.	D
Q19.	A
Q20.	B

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: Third Year Semester : V

Course Code: ECCDLO5014 and Course Name: Data Compression and Encryption

Time: 1 hour Max. Marks: 50

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	What is the characteristic of Network based IDS?
Option A:	They look for attack signatures in network traffic
Option B:	Filter decides which traffic will not be discarded or passed
Option C:	It is programmed to interpret a certain series of packet
Option D:	It models the normal usage of network as a noise characterization
2.	The full form of SSL is
Option A:	Serial Session Layer
Option B:	Secure Socket Layer
Option C:	Session Secure Layer
Option D:	Series Socket Layer
3.	Which protocol consists of only 1 bit in SSL?
Option A:	Alert
Option B:	Handshake
Option C:	Alarm
Option D:	Cipher change spec
4.	Computation of the discrete logarithm is the basis of the cryptographic system in _____
Option A:	Symmetric cryptography
Option B:	Asymmetric cryptography
Option C:	Diffie-Hellman key exchange
Option D:	Secret key cryptography
5.	In RSA, Φ(n) = _____ in terms of p and q.
Option A:	(p)/(q)
Option B:	(p)(q)
Option C:	(p-1)(q-1)
Option D:	(p+1)(q+1)
6.	When a hash function is used to provide message authentication, the hash function value is referred to as
Option A:	Message Field
Option B:	Message Digest
Option C:	Message Score

Option D:	Message Leap
7.	SHA-1 produces a hash value of
Option A:	256
Option B:	160
Option C:	180
Option D:	224
8.	Which of the following is a type of traditional cipher?
Option A:	transportation cipher
Option B:	transposition cipher
Option C:	transforming cipher
Option D:	vigenere cipher
9.	The DES Algorithm Cipher System consists of _____rounds (iterations) each with a round key
Option A:	12
Option B:	18
Option C:	14
Option D:	16
10.	Moving picture expert group 2 is used to compress
Option A:	video
Option B:	audio
Option C:	Image
Option D:	frames
11.	Moving picture expert group 1 is designed for a
Option A:	PC
Option B:	CD
Option C:	DVD
Option D:	Floppy
12.	In audio and Video Compression , each frame is divided into small grids, called as
Option A:	Frame
Option B:	Packet
Option C:	Pixel
Option D:	Byte
13.	Which method is also known as a substitution coder in a data compression algorithm?
Option A:	Transposition Cipher
Option B:	Substitution Cipher
Option C:	Book based Encoding
Option D:	Dictionary-based encoding
14.	_____is used to compress images.

Option A:	MPEG
Option B:	JPEG
Option C:	AVI
Option D:	CPEG
15.	Quantization noise can be reduced by _____ the number of levels.
Option A:	Increasing
Option B:	Decreasing
Option C:	Doubling
Option D:	Multiplying
16.	Which of the following algorithms is the best approach for solving Huffman codes?
Option A:	exhaustive search
Option B:	greedy algorithm
Option C:	brute force algorithm
Option D:	divide and conquer algorithm
17.	Which is the compression method where data is the same as it was before compression when decompressed?
Option A:	Lossy
Option B:	Lossless
Option C:	Keyless
Option D:	Compress
18.	_____is one of the best-known Dictionary-based encoding algorithms.
Option A:	Lempel-Ziv
Option B:	CRZ
Option C:	BMW
Option D:	CBW
19.	What is compression?
Option A:	To compress something by pressing it very hardly
Option B:	To minimize the time taken for a file to be downloaded
Option C:	To reduce the size of data to save space
Option D:	To convert one file to another.
20.	In Huffman coding, data in a tree always occur in_____
Option A:	Roots
Option B:	Leaves
Option C:	Fruit
Option D:	Flower

Q2. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Explain Fermat's theorem.
ii.	Explain Digital Signature.
iii.	Encode the sequence "**BABAABAAA"** using LZW.
B	**Solve any One** **10 marks each**
i.	Explain RSA algorithm.
ii.	Explain DPCM used in audio compression in detail.

Q3. (20 Marks)	
A	**Solve any Two** **5 marks each**
i.	Write a short note on Cryptographic Attacks.
ii.	Explain the features of MPEG-1
iii.	Write a short note on H.261.
B	**Solve any One** **10 marks each**
i.	Explain the working of DES algorithm with Block diagram.
ii.	State the difference between JPEG and JPEG 2000. State the applications, advantages and limitations of JPEG 2000.

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Curriculum Scheme: Rev2016

Examination: Third Year Semester : V

Course Code: ECCDLO5014 and Course Name: Data Compression and Encryption

Time: 1 hour Max. Marks: 50

==========

Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	B
Q3	D
Q4	C
Q5	C
Q6	B
Q7	B
Q8	B
Q9	D
Q10	A
Q11	B
Q12	C
Q13	D
Q14	B
Q15	A
Q16	B
Q17	B
Q18	A
Q19	C
Q20	B

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: Third Year Semester V

Course Code: ECC502 and Course Name: Digital Communication

Time: 1 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** **40**
1.	Let X be a real-valued random variable with $E[X]$ and $E[X^2]$ denoting the mean values of X and X^2, respectively. The relation which always holds
Option A:	$(E[X])^2 > E[X^2]$
Option B:	$E[X^2] \geq (E[X])^2$
Option C:	$E[X^2] = (E[X])^2$
Option D:	$E[X]^2 > (E[X])^2$
2.	What does the central limit theorem state?
Option A:	if the sample size increases sampling distribution must approach normal distribution
Option B:	if the sample size decreases then the sample distribution must approach normal distribution
Option C:	if the sample size increases then the sampling distribution much approach an exponential distribution
Option D:	if the sample size decreases then the sampling distribution much approach an exponential distribution
3.	The value of the probability density function of random variable is___
Option A:	Positive function
Option B:	Negative function
Option C:	Zero
Option D:	One
4.	The source encoder has H=1.75 bits/Message and N=2 bits/Message. Then coding efficiency is,
Option A:	87.5 %
Option B:	90 %
Option C:	50 %
Option D:	20 %
5.	When Information increases then
Option A:	Probability also increases
Option B:	Probability has no relation with information
Option C:	Probability remains constant
Option D:	Probability decreases
6.	Huffman and Shannon Fano coding are types of_____.
Option A:	Channel coding
Option B:	Source coding

Option C:	Error control codes
Option D:	Error correction code
7.	The generator polynomial for cyclic codes with dimension (6,3) is,
Option A:	x+1
Option B:	x^2+2x+1
Option C:	x^3+x+1
Option D:	2x+1
8.	The no of errors detected s and no. of errors corrected t for dmin=3
Option A:	s=2, t=1
Option B:	s=2, t=2
Option C:	s=1, t=1
Option D:	s=3, t=1
9.	If the sum of any two code vectors produces another code vector the code is called as _____.
Option A:	Linear
Option B:	Non linear
Option C:	Summative
Option D:	Cyclic
10.	Which of the following techniques is used for generation of convolutional codes?
Option A:	Tree Diagram
Option B:	Huffman coding
Option C:	Generator matrix
Option D:	Shannon Fano coding
11.	For convolutional encoder, the no. of message bits K considered for encoding at a time are
Option A:	K=2
Option B:	K=4
Option C:	K= 1
Option D:	K=5
12.	The binary modulation format which has better error performance is
Option A:	ASK
Option B:	FSK
Option C:	PSK
Option D:	FSK and ASK
13.	The bandwidth of BFSK is _____ than BPSK.
Option A:	Lower
Option B:	Same
Option C:	Higher
Option D:	Not predictable

14.	The M- Ary modulation is preferred over binary modulation due to
Option A:	Improved noise performance
Option B:	Improved bandwidth efficiency
Option C:	Improved sensitivity
Option D:	Decreased BER
15.	Constellation diagram is used to find,
Option A:	Bandwidth
Option B:	Spectral efficiency
Option C:	Noise performance
Option D:	Power
16.	The process of converting digital symbols into suitable waveform is known as,
Option A:	Source coding
Option B:	Channel coding
Option C:	Line coding
Option D:	Correlative coding
17.	Raised cosine filter with roll off factor $\rho = 1$ gives the transmission band width B_T equal to ___
Option A:	2 W
Option B:	0.5W
Option C:	1W
Option D:	1.5W
18.	Eye diagram is used to find,
Option A:	Data rate of source
Option B:	Entropy
Option C:	Mutual Information
Option D:	ISI introduced by channel
19.	Matched filters may be optimally used only for_____.
Option A:	Gaussian noise
Option B:	Transit time noise
Option C:	Flicker
Option D:	Shot Noise
20.	The optimum filter which gives maximum SNR in presence of white noise is,
Option A:	Nyquist filter
Option B:	Duobinary filter
Option C:	Integrator
Option D:	Matched filter

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	Explain the following terms and give their significance (i) Mean (ii) Central moment (iii) Variance (iv) Standard deviation
B	Consider source alphabet of DMS having source symbols with their respective probabilities 0.40, 0.20,0.12,0.08,0.08 and 0.04 i) Find Entropy of source ii) Find average codeword length iii) Determine coding efficiency iv) Comment on the result
C	Over a long transmission line draw the following data format for the binary sequence 10011101011. i) Unipolar NRZ ii) Polar RZ iii) Manchester iv) AMI Select the best and justify the answer.

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	Consider a convolution encoder with the constraint length K=3 and g^1={1,0,1} and g^2={0,1,1}. Find the code vector for the message stream 11010 using time domain approach. Verify the code vector using transform approach.
B	Explain 16-ary PSK with respect to the following terms i) Modulator and demodulator ii) Power spectral density and bandwidth
C	Derive an expression for probability of matched filter.

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Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: Third Year Semester V

Course Code: ECC502 and Course Name: Digital Communication

Time: 2 hour Max. Marks: 80

==========

Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	A
Q3.	A
Q4	A
Q5	D
Q6	B
Q7	C
Q8.	A
Q9.	A
Q10.	A
Q11.	C
Q12.	C
Q13.	C
Q14.	B
Q15.	C
Q16.	C
Q17.	A
Q18.	D
Q19.	A
Q20.	D

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Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: Third Year Semester V

Course Code: **ECC503** and Course Name: **Electromagnetic Engineering**

Time: 2 hour 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.	If a negative charge is absent, then where do the flux lines terminate?
Option A:	At zero
Option B:	At unity
Option C:	At infinity
Option D:	At radial field
2.	Divergence theorem is applicable for
Option A:	Static fields only
Option B:	Time varying fields only
Option C:	Both static and time varying fields
Option D:	Not applicable to any field
3.	The capacitance of a material refers to
Option A:	Ability of the material to store magnetic field
Option B:	Ability of the material to store electromagnetic field
Option C:	Ability of the material to store electric field
Option D:	Potential between two charged plates
4.	Find the characteristic impedance expression in terms of the inductance and capacitance parameters.
Option A:	Zo = sqrt(LC)
Option B:	Zo = LC
Option C:	Zo = sqrt(L/C)
Option D:	Zo = L/C
5.	Copper behaves as a
Option A:	Conductor always
Option B:	Conductor or dielectric depending on the applied electric field strength
Option C:	Conductor or dielectric depending on the frequency
Option D:	Conductor or dielectric depending on the electric current density
6.	Curl (E) = -∂B/∂t is called
Option A:	Maxwell's equation for static fields
Option B:	Maxwell's equation for time varying fields
Option C:	Gauss Law of electrostatics

Option D:	Biot Savart's law
7.	A boundary of separation between two magnetic materials is identified by which factor?
Option A:	Change in the permeability
Option B:	Change in permittivity
Option C:	Change in magnetization
Option D:	Conduction
8.	Given that the reflection coefficient is 0.6. Find the VSWR.
Option A:	2
Option B:	4
Option C:	6
Option D:	8
9.	The ratio of conduction to displacement current density is referred to as
Option A:	Attenuation constant
Option B:	Propagation constant
Option C:	Loss tangent
Option D:	Dielectric constant
10.	The SI unit of magnetic field intensity is
Option A:	A/m
Option B:	V/m
Option C:	C/m
Option D:	F/m
11.	Which component of the electric field intensity is always continuous at the boundary?
Option A:	Tangential
Option B:	Normal
Option C:	Horizontal
Option D:	Vertical
12.	Which of the following cannot be computed using the Biot-Savart's law?
Option A:	Magnetic field intensity
Option B:	Magnetic flux density
Option C:	Electric field intensity
Option D:	Permeability
13.	Consider a transmission line of characteristic impedance 50 ohm. Let it be terminated at one end by +j50 ohm. The VSWR produced by it in the transmission line will be
Option A:	1
Option B:	0
Option C:	Infinity
Option D:	+j

14.	_____ provides a method whereby the potential function can be obtained subject to the conditions on the boundary.
Option A:	Poisson's Equation
Option B:	Faraday's Law
Option C:	Laplace's Equation
Option D:	Poynting Theorem
15.	If divergence of a field is positive, then field acts as a
Option A:	Reducing field
Option B:	Increasing field
Option C:	Converging field
Option D:	Diverging field
16.	Total magnetic flux crossing a closed surface is
Option A:	Total flux enclosed by the surface
Option B:	Total current enclosed by the surface
Option C:	Total charge enclosed by the surface
Option D:	Zero
17.	The open wire transmission line consists of
Option A:	Conductor
Option B:	Dielectric
Option C:	Both conductor and dielectric
Option D:	Either conductor or dielectric
18.	The magnitude of the Ex and Ey components are the same in which type of polarization?
Option A:	Linear
Option B:	Circular
Option C:	Elliptical
Option D:	Perpendicular
19.	A bar magnet is divided in two pieces. Which of the following statements is true?
Option A:	The bar magnet is demagnetized.
Option B:	The magnetic field of each separated piece becomes stronger.
Option C:	The magnetic poles are separated.
Option D:	Two new bar magnets are created.
20.	One Tesla is equal to
Option A:	1 Wb/m^2
Option B:	1 C/m^2
Option C:	1 Wb/C
Option D:	1 N/C

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	If $\underline{E} = 2r^2 cos cos\varphi \underline{a_\varphi} \dots \frac{V}{m}$ found in chemical ($\varepsilon = 2\varepsilon_0$) filled cylindrical chamber having radius r = 0.2m and height z = 1m, find total charge lying on the chemical.
B	Two isolated cone having same radius suspended on two angles $\theta = 30°$ & $\theta = 60°$ excited by voltage $V(\theta = 30°) = 100\,V$ & $V(\theta = 60°) = 200\,V$, then find out Electric field generated between two cones and prove it in between two cone Electric fields passing through the charge free region.
C	Derive magnetic field due infinite straight current carrying conductor.

Q3	**Solve any Two Questions out of Three** **10 marks each**
A	Oscillating EM wave used to check properties of non-magnetic dielectric paraffin wax ($\sigma = 0, \mu = \mu_0$) at $f = 100\,MHz$. By experimentation we get ($\varepsilon = 4\varepsilon_0$) for paraffin wax. Find out following properties of EM wave generated in given paraffin wax material: i) Attenuation constant ii) Phase constant iii) Phase velocity iv) Intrinsic impedance v) Magnetic field induced in material if $\lvert\underline{E}\rvert = 10\frac{KV}{m}$
B	Strip of transmission line is designed on Fibre glass substrate having relative permittivity of $\varepsilon_r = 4$ operating at $f = 2\,GHz$ and terminated with load impedance of $Z_L = 120 + 150j\,\Omega$ with $Z_0 = 100\,\Omega$; find out input impedance of transmission line if strip length is $l = 0.2\lambda$ at a given frequency. Solve by Analytical methods.
C	Explain electrostatic breakdown in lightning and its conditions.

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: Third Year Semester V

Course Code: **ECC503** and Course Name: **Electromagnetic Engineering**

Time: 2 hour Max. Marks: 40

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Q1.	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
1.	C
2.	C
3.	C
4	C
5	A
6	B
7	A
8.	B
9.	C
10.	A
11.	A
12.	D
13.	C
14.	C
15.	D
16.	D
17.	C
18.	B
19.	D
20.	A

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE, Semester: V

Course Code: ECCDLO 5013 and Course Name: Elective I: Finite Automata Theory

Time: 2 hour Max. Marks: 80

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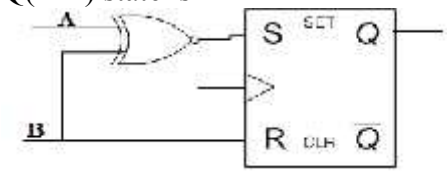
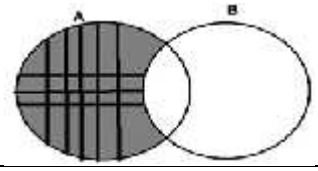
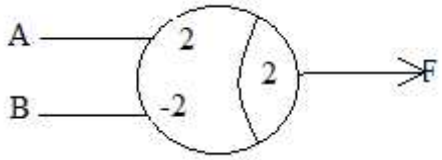
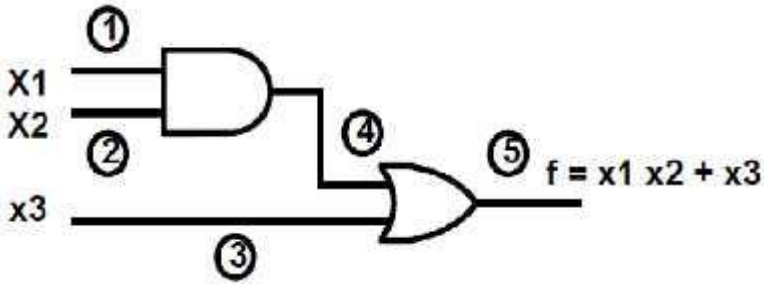
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	A switching function *F* can be decomposed into two threshold elements F_1 and F_2. The function F can be implemented using_____
Option A:	2 threshold elements interconnected to perform AND operation
Option B:	2 threshold elements interconnected to perform NAND operation
Option C:	2 threshold elements interconnected to perform OR operation
Option D:	2 threshold elements interconnected to perform NOR operation
2.	How many flip-flops will be complemented in a 10-bit binary ripple counter to reach the next count after the count 1001100111
Option A:	4
Option B:	5
Option C:	6
Option D:	9
3.	The race in which stable state depends on order is called
Option A:	Critical race
Option B:	Identical race
Option C:	Non critical race
Option D:	Defined race
4.	The table having one state in each row is called
Option A:	Transition table
Option B:	State table
Option C:	Flow table
Option D:	Primitive flow table
5.	Conditional box has a shape of
Option A:	Square
Option B:	Rectangle
Option C:	Oval
Option D:	Pentagon
6.	How many number of prime implicants are there in the expression F(x, y, z) = y'z' + xy + x'z.

Option A:	7
Option B:	19
Option C:	3
Option D:	53
7.	In digital circuits permanent faults may arises due to
Option A:	Noise
Option B:	Non ideal transient behaviour of components
Option C:	Failure of component
Option D:	Propagation time
8.	A threshold function
Option A:	May be a unate function
Option B:	is not a unate function
Option C:	Is always a unate function
Option D:	may or may not be unate function
9.	An AB flip-flop is constructed from an SR flip-flop. The expression for next Q(n+1) state is 
Option A:	$\overline{A}\overline{B} + AQ$
Option B:	$\overline{A}\overline{B} + \overline{B}Q$
Option C:	Both A and B
Option D:	A+B
10.	Race condition is present in
Option A:	synchronous logic circuit
Option B:	asynchronous logic circuit
Option C:	ideal logic circuit
Option D:	Combinational logic circuit
11.	An implicant that is not a proper subset of any other implicant i.e. it is not completely covered by any single implicant, is called
Option A:	Intersection set
Option B:	Essential prime implicant
Option C:	Prime implicant
Option D:	Union set
12.	The shaded area of the figure is best described by? 
Option A:	A‘ (Complement of A)
Option B:	A U B -B

Option C:	$A \cap B$
Option D:	B'(complement of B)
13.	The T-gate shown below represents F= 
Option A:	$\overline{A}B$
Option B:	$A\overline{B}$
Option C:	AB
Option D:	$\overline{A}\overline{B}$
14.	The binary relation {(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)} on the set {1, 2, is _____
Option A:	reflective, symmetric and transitive
Option B:	irreflexive, symmetric and transitive
Option C:	neither reflective, nor irreflexive but transitive
Option D:	irreflexive and antisymmetric
15.	Suppose a relation R = {(3, 3), (5, 5), (5, 3), (5, 5), (6, 6)} on S = {3, 5, 6}. Here R is known as _____
Option A:	equivalence relation
Option B:	reflexive relation
Option C:	symmetric relation
Option D:	transitive relation
16.	In system engineering which of the following methods bridges the gap between the two ends of system development?
Option A:	ASM method
Option B:	VSM method
Option C:	Factor method
Option D:	FSM method
17.	According to Moore circuit, the output of synchronous sequential circuit depend/s on _____ of flip flop
Option A:	Past state
Option B:	Present state
Option C:	Nest state
Option D:	External inputs
18.	How many binary relations are there on a set S with 9 distinct elements?
Option A:	2^{90}
Option B:	2^{100}
Option C:	2^{81}
Option D:	2^{60}
19.	Simplify the expression using K-maps: F(A,B,C) = π(0,2,4,5,7).

Option A:	(x+y)(y+z)(x+z)(x'+z')
Option B:	(x+z')(y+z)(x+y)
Option C:	(x+y'+z)(x+z')
Option D:	(y'+z')(x'+y)(z+y')
20.	In dynamic hazards multiple output transition can occur if
Option A:	Circuit have single path with different delay
Option B:	Circuit have multiple path with different delay
Option C:	Circuit have multiple path with single delay
Option D:	Circuit have single path with single delay

Q2.	**Solve any Two Questions out of Three** **10 marks each**
A	Design a 3 bit counter which counts in the following sequence using T flip flop. 0—1—3—4—5—7—0-……etc.
B	Find the fault table for all stuck-at faults of the following circuit. And prepare test generation using exclusive or method 
C	The set {a,b,c,d,e,f,g,h,i,j,k} has the partitions $\pi_1 = \{\underline{a,b,c};\underline{d,e};\underline{f};\underline{g,h,i};\underline{j,k}\}$ $\pi_2 = \{\underline{a,b};\underline{c,g,h};\underline{d,e,f};\underline{i,j,k}\}$ $\pi_3 = \{\underline{a,b,c,f};\underline{d,e,g,h,i,j,k}\}$ i) Find $\pi_1 + \pi_2$ and $\pi_1.\pi_2$ ii) Find $\pi_1 + \pi_3$ and $\pi_1.\pi_3$ iii) Find a partition that is greater than π_1 and smaller than π_3.

Q3.	**Solve any Two Questions out of Three 10 marks each**
A	Explain distinguishing and synchronizing sequence techniques.
B	Find the homing sequence and synchronizing sequence for the following machine.

Present State	**Next State, Z**	
	X=0	**X=1**
A	B,0	D,0
B	A,0	B,0
C	D,1	A,0
D	D,1	C,0

C	Realize the Boolean function using Threshold gate $f(w,x,y,z) = \sum m(0,1,4,5,8,9,11,13)$

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: TE, Semester: V

Course Code: ECCDLO 5013 and Course Name: Elective I: Finite Automata Theory

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	C
Q2.	A
Q3.	A
Q4	D
Q5	C
Q6	C
Q7	C
Q8.	C
Q9.	B
Q10.	B
Q11.	C
Q12.	B
Q13.	B
Q14.	C
Q15.	A
Q16.	A
Q17.	B
Q18.	C
Q19.	A
Q20.	B

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: **EXTC**

Curriculum Scheme: Rev2016

Examination: TE SemV

Course Code: ECCDLO-5011 and Course Name: Microelectronics

Time: 2 hour Max. Marks: 80

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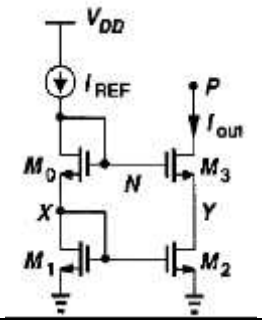
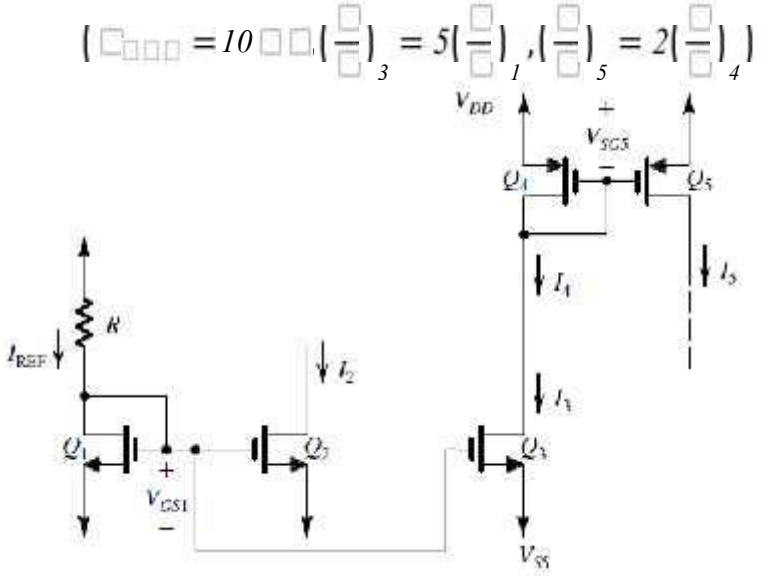
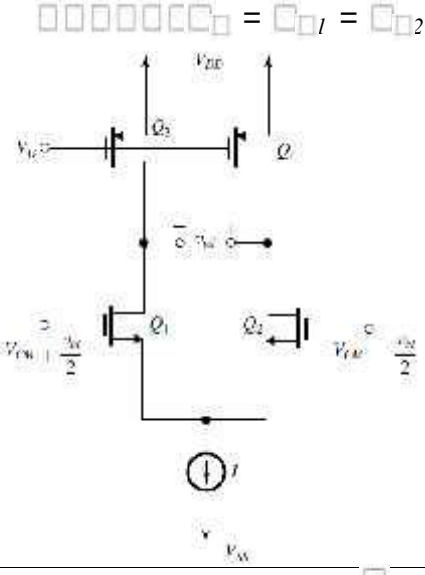
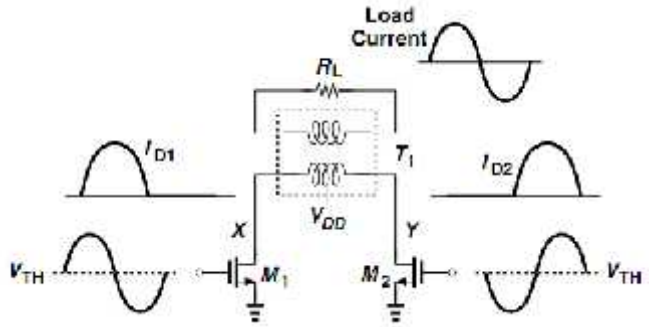
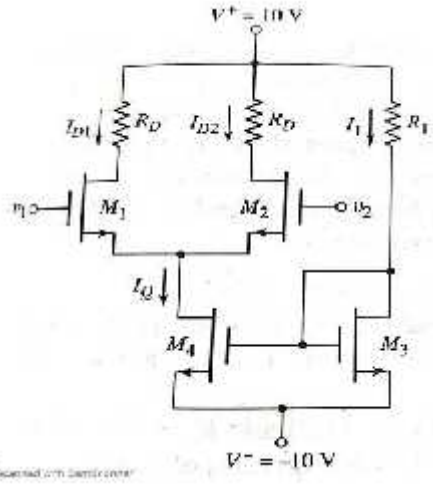
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Due to body bias effect
Option A:	Threshold voltage increases
Option B:	Threshold voltage decreases
Option C:	No change in threshold voltage
Option D:	Increase drain current
2.	Oxidation process is carried out using
Option A:	Oxygen
Option B:	Low purity oxygen
Option C:	Sulphur
Option D:	Nitrogen
3.	The Gate to source Capacitance, C_{gs} of a MOSFET in saturation region is given as _____ (L = actual channel length, L_D = gate source overlap length)
Option A:	_____
Option B:	_____
Option C:	$\frac{1}{2}$ □□□□□ + $\frac{1}{2}$ □□□□
Option D:	$\frac{2}{3}$ □□□□ + □□□□□
4.	The o/p resistance offered by MOSFET is given as
Option A:	$1/I_D$
Option B:	$1/\lambda I_D$
Option C:	$1/V_{DS}$
Option D:	$1/\lambda V_{Ds}$
5.	Identify the following circuit 

Option A:	Basic current mirror
Option B:	Cascode current mirror
Option C:	Modified Wilson current mirror
Option D:	Bias independent current source
6.	Which of the following in property of Bias independent current source
Option A:	Reference current is function of applied supply voltage
Option B:	Load current is function of supply voltage
Option C:	Load current are essentially independent of supply voltage
Option D:	Reference current is function of temperature
7.	Calculate the Current I_5. 
Option A:	100 µA
Option B:	10 µA
Option C:	50 µA
Option D:	110 µA
8.	Minimum number of Transistor Practical Cascode current source circuits required are ?
Option A:	1
Option B:	3
Option C:	5
Option D:	7
9.	Resistive load CS Amplifier is not preferred because
Option A:	It consumes small silicon area
Option B:	It consumes large silicon area
Option C:	Output swing is smaller
Option D:	Power dissipation is very high
10.	Cascode Amplifier is combination of
Option A:	CS-CS stage
Option B:	CS-CD stage
Option C:	CS-CG stage

Option D:	CD-CG stage
11.	For the diode connected CS amplifier (W1/L1) = (100/0.5), (W2/L2) = 10/0.5, ID1=ID2= 0.5ma, Vtn = 0.7 V. Calculate overall voltage gain.
Option A:	2.1622
Option B:	10
Option C:	0.10
Option D:	3.1622
12.	The voltage gain of double cascode amplifier is
Option A:	$g_m r_o$
Option B:	$g_m^2 r_o^2$
Option C:	$g_m^2 r_o^2$ /2
Option D:	$g_m^2 r_o^2$ /4
13.	Differential Amplifier with active load is preferred over differential amplifier with resistive load because
Option A:	Active load differential amplifier consumes less silicon area
Option B:	Active load differential amplifier consumes more silicon area
Option C:	Active load differential amplifier consumes more power
Option D:	Active load differential amplifier is more noisy
14.	For a MOSFET if g_m=1mili mho and r_o=10KΩ,then its intrinsic voltage gain is
Option A:	1
Option B:	10
Option C:	100
Option D:	1000
15.	Find the expression of the differential voltage gain for the given circuit. 
Option A:	$A_v = \frac{g_{m1}}{g_{m3}} = g_{m1}(r_{o1} \parallel r_{o3})$
Option B:	$A_v = \frac{g_{m3}}{g_{m3}} = g_{m3}(r_{o3} \parallel r_{o4})$
Option C:	$A_v = \frac{g_{m1}}{g_{m4}} = g_{m4}(r_{o1} \parallel r_{o4})$

Option D:	$A_v = \frac{V_{out}}{V_{in}} = g_m(r_{o3} \parallel r_{o4})$
16.	The number of input terminals The differential amplifier has
Option A:	1
Option B:	2
Option C:	3
Option D:	4
17.	Maximum achievable power efficiency of Class C amplifier is
Option A:	25%
Option B:	50%
Option C:	78%
Option D:	More than 90%
18.	Which type of power amplifier is the given circuit? 
Option A:	Class B
Option B:	Class E
Option C:	Class F
Option D:	Class C
19.	To fabricate Inductor inside the IC we use
Option A:	Plastic spiral wire
Option B:	Polysilicon spiral wire.
Option C:	Silicon spiral wire
Option D:	Metal spiral wire
20.	In class D Power amplifier the MOS transistors operates in
Option A:	Triode region
Option B:	Acts as switch
Option C:	Saturation Region
Option D:	Breakdown region.

Q2	**Solve any Two Questions out of Three 10 marks each**

A	 In the given circuit for the MOSFET M_1 and M_2 V_{TN}=1V,K_N=0.1Ma/V^2,λ=0.For M_3 and M_4 V_{TN}=1V,K_N=0.3Ma/V^2,λ=0.01V^{-1} Determine value of I_Q,A_d,A_{CM},and CMRR.If R_D=25KΩ,R_1=30KΩ.
B	Explain in detail fabrication of inductor
C	Explain with proper diagram CLASS D power amplifier

Q3.	**Solve any Two Questions out of Three 10 marks each**
A	What is the drawback of Current Mirror circuit, how to overcome it? Draw and explain the working of Cascode current source.
B	For CS amplifiers with PMOS diode connected load derive the equation for voltage gain and output voltage swing.
C	Explain the various parasitic Capacitances associated with the MOSFET.

University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: **EXTC**

Curriculum Scheme: Rev2016

Examination: TE Semester V

Course Code: ECCDLO5011 and Course Name: Microelectronics

Time: 2 hour Max. Marks: 80

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	A
Q3.	D
Q4	B
Q5	B
Q6	C
Q7	A
Q8.	C
Q9.	A
Q10.	B
Q11.	D
Q12.	C
Q13.	A
Q14.	B
Q15.	A
Q16.	B
Q17.	D
Q18.	A
Q19.	B
Q20.	D