

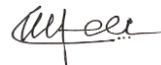
K. J. Somaiya Institute of Engineering and Information Technology
Sion, Mumbai - 400022
NAAC Accredited Institute with 'A' Grade
NBA Accredited 3 Programs
(Computer Engineering, Electronics & Telecommunication Engineering and Electronics Engineering)
Permanently Affiliated to University of Mumbai

EXAMINATION TIME TABLE (JANUARY 2021)
PROGRAMME - B.E. (Electronics) (REV-2012)(CBSGS)
SEMESTER - VII

Days and Dates	Time	Course Code	Paper
Friday, January 08, 2021	03:30 p.m. to 05:30 p.m.	EXC701	Embedded System Design
Monday, January 11, 2021	03:30 p.m. to 05:30 p.m.	EXC702	IC Technology
Wednesday, January 13, 2021	03:30 p.m. to 05:30 p.m.	EXC703	Power Electronics -II
Friday, January 15, 2021	03:30 p.m. to 05:30 p.m.	EXC704	Computer Communication Networks
Monday, January 18, 2021	03:30 p.m. to 05:30 p.m.	EXC7051	Elective I :- 1) Digital Image Processing
Monday, January 18, 2021	03:30 p.m. to 05:30 p.m.	EXC7052	2) Artificial Intelligence
Monday, January 18, 2021	03:30 p.m. to 05:30 p.m.	EXC7053	3) ASIC Verification
Monday, January 18, 2021	03:30 p.m. to 05:30 p.m.	EXC7054	4) Optical Fiber Communication

Important Note: • Change if any, in the time table shall be communicated on the college web site.

Mumbai
20th December, 2020.


Principal

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examination Commencing from 7th January 2021 to 20th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev2012
Examination: BE Semester VII
Course Code: EXC701 and Course Name: Embedded System Design
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 you call the macros multiple times then
Option A:	code length increases
Option B:	code length remains same
Option C:	code will not execute
Option D:	code length decreases
2.	The address space in Cortex M3 is
Option A:	8 GB
Option B:	6 GB
Option C:	4GB
Option D:	16 GB
3.	Which of the following are the three measures of information security in embedded systems?
Option A:	Confidentiality, secrecy, integrity
Option B:	Confidentiality, transparency, availability
Option C:	Integrity, transparency, availability
Option D:	Confidentiality, integrity, availability
4.	The serial communication interface (SCI) is a
Option A:	two wire synchronous serial port
Option B:	one wire asynchronous serial port
Option C:	one wire synchronous serial port
Option D:	two wire asynchronous serial port
5.	Solenoid valve is a example of
Option A:	Sensor
Option B:	Input device
Option C:	Actuator
Option D:	Transducer
6.	In MSP430microcontroller setting Oscillator OFF bit
Option A:	Turns OFF LFXT1 crystal oscillator
Option B:	Turns OFF DCO
Option C:	Turns OFF XT2

Option D:	Turns OFF SMCLK
7.	Which of the following has programmable hardware?
Option A:	Microprocessor
Option B:	Microcontroller
Option C:	Co-processor
Option D:	FPGA
8.	In cortex M3, M profile stands for
Option A:	Medium
Option B:	Microcontroller
Option C:	Market
Option D:	Memory
9.	Which of the following is not a assumption for RMA
Option A:	Highest priority task will run first
Option B:	all tasks run at regular interval
Option C:	Tasks do not synchronize with each other
Option D:	Lowest priority task will run first
10.	One of the major drawbacks of assembly language programming over C is
Option A:	lower memory requirements
Option B:	program executes faster
Option C:	codes are not portable
Option D:	hardware specific instructions are available
11.	In which scheduling certain amount of time slice of CPU time is allocated to each process?
Option A:	Round Robin(RR)
Option B:	Shortest Job First(SJF)
Option C:	Last In First Out(LIFO)
Option D:	First In First Out(FIFO)
12.	For a good scheduling algorithm, the Turn Around Time (TAT) for a process should be
Option A:	Maximum
Option B:	Average
Option C:	Varying
Option D:	Minimum
13.	In which type of testing, internal working of application is required
Option A:	White Box
Option B:	Black Box
Option C:	Gray box
Option D:	Black Box & Gary Box
14.	Which of the following is true about task scheduling under MicroC/OS-II Kernel?
Option A:	Pre-emptive priority based with Round Robin with priority inversion
Option B:	Round Robin scheduling
Option C:	Priority based non-preemptive scheduling

Option D:	Priority based pre-emptive scheduling
15.	Priority inversion is
Option A:	the condition in which a low priority task needs to wait for a high priority task
Option B:	the condition in which a high priority task needs to wait for a low priority task
Option C:	the act of increasing the priority of a process dynamically
Option D:	the act of decreasing the priority of a process dynamically
16.	A testing in which programming skills are needed is called
Option A:	black box testing
Option B:	white box testing
Option C:	hardware testing
Option D:	unit testing
17.	Embedded system should be a
Option A:	Flexible System
Option B:	Rigid System
Option C:	General Purpose System
Option D:	Multitasking System
18.	Which one of the following embedded systems is an example of soft real time system?
Option A:	Air-bag safety system in vehicles
Option B:	Car cruise control system
Option C:	Anti-lock Brake Systems of vehicles
Option D:	Automatic Chocolate Vending machine
19.	Which of the following is true about hard real time systems?
Option A:	Missing deadlines for tasks are acceptable
Option B:	Strictly adhere to the timing constraints for a task
Option C:	Always contains a human in the loop
Option D:	Implement virtual memory-based memory management
20.	ARM Cortex M3 processor can enter sleep mode using _____ instruction.
Option A:	MSR
Option B:	WFI
Option C:	REV
Option D:	SDIV

Q2. A	Solve any Two (5 Marks each)	10 Marks
i.	Distinguish between Macro and Function with an example in C-programming.	
ii.	Explain the features of CAN Bus which makes it popular in industrial application.	
iii.	Discuss Round Robin Scheduling with an example.	
Q2. B	Solve any One (10 Marks each)	10 Marks
i.	How will you select a suitable Real Time Operating System for given application? Discuss functional and non-functional requirements.	
ii.	Explain with diagram, UML (Unified Modeling Language) model with an example.	

Q3. A	Solve any Two (5 Marks each)	10 Marks
i.	List and explain Task related function calls supported by MicroC/OS-II	
ii.	Explain the fundamental issues in hardware software co-design.	
iii.	Draw and discuss Linear or Waterfall model used in embedded product development Lifecycle.	
Q3. B	Solve any One (10 Marks each)	10 Marks
i.	Discuss various issues in the Task synchronization in the embedded system design.	
ii.	Design Weather monitoring system to indicate temperature, atmospheric pressure, humidity etc. Design should include block diagram, selection of components, software algorithm and testing.	

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Curriculum Scheme: Rev2012

Examination: BE Semester VII

Course Code: EXC701 and Course Name: Embedded System Design

Time: 2-hour

Max. Marks: 80

=====

Q.1:

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

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Program: **Electronics Engineering**
Curriculum Scheme: Rev 2012
Examination: BE Semester VII
Course Code: EXC702 and Course Name: IC Technology

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	In the following line, liquid phase exist for all compositions in a phase diagram.
Option A:	Tie-line
Option B:	Solvus
Option C:	Solidus
Option D:	Liquidus
2.	In the process of Czochralski method which of the following relation is appropriate between the melt and the growing crystals?
Option A:	Melt and the growing crystals are usually not related to each other
Option B:	Melt and the growing crystals are usually rotated counterclockwise
Option C:	Melt and the growing crystals are usually rotated clockwise
Option D:	Melt and the growing crystals are usually kept at a constant position
3.	The point at which two liquidus lines meet is known as _____
Option A:	Eutectic point
Option B:	Isothermal point
Option C:	Solvus point
Option D:	Peritectic point
4.	For which of the following physical deposition technique is not suitable?
Option A:	Deep trenches
Option B:	Flat surfaces
Option C:	Wafer of very reactive material
Option D:	Rough surfaces
5.	Mention the chemical reaction for oxidation process
Option A:	$Si + 2H_2O \rightarrow SiO_2 + 2H_2$
Option B:	$Si + O_2 \rightarrow SiO_2$
Option C:	$2Si + 2H_2O \rightarrow 2SiO_2 + 2H_2$
Option D:	$2Si + 2H_2O + 2O_2 \rightarrow 2SiO_2 + 2H_2 + O_2$

6.	As the temperature rises, the rate of vacancy diffusion in metals
Option A:	Decreases linearly
Option B:	Remains the same
Option C:	Increases
Option D:	Decreases exponentially
7.	The Wafer is tilted during Ion implantation at
Option A:	7°
Option B:	30°
Option C:	45°
Option D:	70°
8.	Lithography process is used to pattern:
Option A:	Metal and semiconductor layers
Option B:	Metal and insulating layers
Option C:	Semiconductor and insulation layer
Option D:	Metal, Semiconductor and insulation layers
9.	In ion-assisted etching process, CHF ₃ is used in:
Option A:	Dry etching of silicon dioxide
Option B:	Dry etching of silicon nitride
Option C:	Wet etching of silicon dioxide
Option D:	Dry etching of silicon dioxide and silicon nitride
10.	Stick diagram shows_____
Option A:	Exact placements of components
Option B:	Lower level details such as parasitic
Option C:	Wire length, wire thickness etc.
Option D:	Relative placements of components
11.	Twin – Tube process is widely used for fabrication of
Option A:	CMOS
Option B:	PMOS
Option C:	NMOS
Option D:	BJT
12.	Which one of the following major phases in IC processing is the most important in determining the overall yield of ICs:
Option A:	Chip separation from the wafer
Option B:	Crystal growing of the starting ingot
Option C:	Packaging of the individual ICs
Option D:	Wafer processing of the individual ICs on the wafer
13.	The mobility is given by
Option A:	$\mu = V_0/E_0$
Option B:	$\mu = E_0/ V_0$
Option C:	$\mu = V_0^2/E_0$
Option D:	$\mu = V_0/E_0^2$

14.	Which one of the following IC packaging styles provides the opportunity for the largest number of terminals in the package:									
Option A:	Ball grid array									
Option B:	Dual in-line package									
Option C:	Pin grid array									
Option D:	Square package									
15.	Drift current in semiconductors depends upon									
Option A:	Only the electric field									
Option B:	Only the carrier concentration gradient									
Option C:	Both the electric field and the carrier concentration									
Option D:	Neither the electric field nor the carrier concentration gradient									
16.	Smart cut wafer fabrication process is for which device									
Option A:	SOI device									
Option B:	GaAs Device									
Option C:	Nanowire Device									
Option D:	Carbon Nanotube Device									
17.	Match the column 1 with column 2									
	<table border="1"> <thead> <tr> <th>Column1</th> <th>Column2</th> </tr> </thead> <tbody> <tr> <td>X FDSOI</td> <td>i Floating body</td> </tr> <tr> <td>Y PDSOI</td> <td>ii No floating body</td> </tr> <tr> <td>Z NMOS</td> <td>iii No insulating BOX layer</td> </tr> </tbody> </table>	Column1	Column2	X FDSOI	i Floating body	Y PDSOI	ii No floating body	Z NMOS	iii No insulating BOX layer	
Column1	Column2									
X FDSOI	i Floating body									
Y PDSOI	ii No floating body									
Z NMOS	iii No insulating BOX layer									
Option A:	X-i, Y-ii, Z-iii									
Option B:	X-ii, Y-i, Z-iii									
Option C:	X-iii, Y-ii, Z-i									
Option D:	X-ii, Y-iii, Z-i									
18.	A second effect that occurs under high current conditions in BJT is called _____									
Option A:	Kirk									
Option B:	Kink									
Option C:	Breakdown									
Option D:	Punchthrough									
19.	The role of hard mask in Fin FET is _____									
Option A:	Increase short channel effect									
Option B:	Increase DIBL									
Option C:	Prevent formation of parasitic inversion channel									
Option D:	Increase subthreshold current									
20.	Carbon nanotube is made of									
Option A:	Silicon									
Option B:	Ge									
Option C:	GaAs									
Option D:	Graphene									

Q2	
A	Solve any Two (5 Marks each) 10 Marks
i.	Enlist the steps for obtaining Silicon from Sand
ii.	Explain Predeposition and drive in steps in diffusion process
iii.	Write short note on lambda based design rules
B	Solve any One (10 Marks each) 10 Marks
i.	Write short note on-Hall effect measurement and resistivity measurement of semiconductor.
ii.	Describe the process flow of E/D technology for MESFET in detail with neat diagram.

Q3	
A	Solve any Two (5 Marks each) 10 Marks
i.	What are the Pros and Cons of Ion Implantation Vs Diffusion
ii.	What are advantages and disadvantages of Float Zone method over CZ method for silicon crystal growth.
iii.	Write short notes on IC packaging
B	Solve any One (10 Marks each) 10 Marks
i.	Draw schematic of single- walled carbon nanotube formation process and explain in detail.
ii.	Explain buried and butting contact with neat diagram.

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Course Code: EXC702 and Course Name: IC Technology

Time: 2 hour

Max. Marks: 80

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Q1:

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

Important steps and final answer for the questions involving numerical example

Q2(A):Q2(B): Q3(A): Q3(B): No need of answer key.

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Program: **Electronics Engineering**
Curriculum Scheme: Rev2012
Examination: BE Semester VII
Course Code: EXC703 and Course Name: Power Electronics II

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	In case of controlled rectifiers, the nature of the load current (continuous or discontinuous)
Option A:	depends upon the type of load and firing angle.
Option B:	depends upon the only on the type of load
Option C:	depends upon the only on the firing angle
Option D:	independent of all the parameters
2.	The effect of source inductance on the performance of a 3-phase controlled converter is
Option A:	increase the average load voltage
Option B:	reduce the average load voltage
Option C:	make the load current continuous
Option D:	remove ripples from the load current
3.	In case of sinusoidal pulse width modulation with $MI < 1$, if the number of pulses per half cycle $(N) = 7$, then
Option A:	harmonics of order 7 become significant
Option B:	harmonics of order 5 and 9 become significant
Option C:	harmonics of order 6 and 8 become significant
Option D:	harmonics of order 13 and 15 become significant
4.	In an inverter, if the fundamental output frequency is 60 Hz, then the frequency of the lowest order harmonic will be
Option A:	60 Hz
Option B:	120 Hz
Option C:	180 Hz
Option D:	240 Hz
5.	The number of steps requires for the 120° mode of operation of a three phase bridge inverter are
Option A:	2
Option B:	4
Option C:	6
Option D:	8

6.	The expression for a buck-boost converter with α as the duty cycle and V_s as the dc input voltage is
Option A:	$V_s/1 - \alpha$
Option B:	$\alpha \times V_s$
Option C:	$V_s(\alpha/1-\alpha)$
Option D:	$V_s(\alpha/1+\alpha)$
7.	Which among the following constitute the state model of a system in addition to state equations?
Option A:	Input equations
Option B:	Output equations
Option C:	State trajectory
Option D:	State vector
8.	For the supply voltage 186 V and duty cycle value is 0.6, calculate the output voltage of the Boost converter.
Option A:	260 V
Option B:	320V
Option C:	380V
Option D:	465 V
9.	For a buck/boost converter, if current increases from I_1 to I_2 linearly during T_{on} , then the energy stored in the inductor during T_{on} is
Option A:	zero
Option B:	$V_s \times (I_1 + I_2)$
Option C:	$V_s \times [(I_1 + I_2)/2] \times T_{on}$
Option D:	$V_s \times [(I_1 + I_2)/2] \times T$
10.	The most suitable device for high-frequency inversion in switching mode power supply is
Option A:	GTO
Option B:	BJT
Option C:	MOSFET
Option D:	IGBT
11.	SMPS is based on the principle.
Option A:	Phase control
Option B:	MOSFET
Option C:	Integral control
Option D:	Chopper
12.	Static UPS requires
Option A:	only rectifier.
Option B:	only inverter.
Option C:	neither inverter nor rectifier.
Option D:	both inverter and rectifier.
13.	Regenerative braking mode can be achieved in which quadrant (V-I curve)?

Option A:	first
Option B:	second
Option C:	third
Option D:	fourth
14.	What is the relationship between torque and speed in constant type loads?
Option A:	Torque is independent of speed
Option B:	Torque linearly increases with increase in speed
Option C:	Torque non-linearly increases with an increase in speed
Option D:	Torque non-linearly decreases with an increase in speed
15.	In a DC series motor and DC shunt motor, the electromagnetic torque developed is proportional to _____ respectively.
Option A:	I_a and I_a^2
Option B:	I_a^2 and I_a
Option C:	I_a^3 and I_a^2
Option D:	$1/I_a$ and I_a
16.	Stator voltage control for the speed control of induction motor is suitable for
Option A:	Fan and Pump Drive
Option B:	Drive of a crane
Option C:	Running as the generator
Option D:	Constant Load drive
17.	V/f is maintained constant in the following case of speed control of induction motor:
Option A:	Below the base speed with voltage control
Option B:	Above the base speed
Option C:	Below the base speed with frequency control
Option D:	Above base speed with frequency control
18.	In the rotor voltage injection method, when an external voltage source is in phase with the main voltage then speed will
Option A:	Increase
Option B:	Decrease
Option C:	Remain unchanged
Option D:	First increases then decrease
19.	The power factor of a squirrel cage induction motor is _____.
Option A:	High at light load only
Option B:	High at heavy loads only
Option C:	Low at the light and heavy loads both
Option D:	Low at rated load only
20.	The value of slip at which maximum torque occurs _____.
Option A:	R_2/X_2
Option B:	$4R_2/X_2$
Option C:	$2R_2/X_2$
Option D:	$R_2/3X_2$

Q2.	Solve any Four. (5 Marks each)	20 Marks
A	What are the advantages of SVM over the conventional Sine wave PWM? Explain.	
B	Describe the principle of Step up and Step down Chopper.	
C	Explain the concept of UPS and give classification of UPS system.	
D	Explain regenerative braking for DC motors.	
E	Draw the Torque-Speed Characteristics of three-phase induction motor during plugging, motoring and generating modes.	
F	Explain why V/F control is popular in AC induction motor control.	

Q3.	Solve any Two. (10 Marks each)	20 Marks
A	Derive the expression for average load voltage of a 1-phase full Converter by considering the source inductance.	
B	Explain state space average model of buck-boost converter.	
C	A separately excited DC motor operating from a single phase half controlled bridge at a speed of 1400 rpm, has an input voltage of $330\sin(314t)$ and a back emf 80 V. The SCRs are fired symmetrically at α equal to 30° in every half cycle and armature resistance is 4Ω . Calculate the Average armature current and motor torque.	

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Course Code: EXC703 and Course Name: Power Electronics II

Time: 2 hour

Max. Marks: 80

Q1:

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

Important steps and final answer for the questions involving numerical example

$$Q3(C): V_o = V_t = V_m / \pi (1 + \cos \alpha) = E_a + I_a R_a$$

$$I_a = 29.003 \text{ A}$$

$$T_e = K_m \cdot I_a$$

$$E_a = K_m \cdot \omega_m$$

$$K_m = 0.546 \text{ Nm/A}$$

$$T_e = 15.836 \text{ Nm}$$

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Curriculum Scheme: Rev 2012
Examination: BE Semester VII
Course Code: EXC704 Course Name: Computer Communication Networks
Time: 2 hour Max. Marks: 80

Q1.	Choose the correct option for following questions. All the sub questions are compulsory and carry two marks each . Total marks for this (Q1) is 40.
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1.	A _____ is a group of computers and devices that share a communications line or wireless connection.
Option A:	MAN
Option B:	WAN
Option C:	LAN
Option D:	PAN
2.	The _____ layer uses a Media Access Controller (MAC) to generate the frames that will be transmitted.
Option A:	data link
Option B:	network
Option C:	transport
Option D:	physical
3.	The _____ layer of the OSI model is where users communicate with the computer
Option A:	application
Option B:	physical
Option C:	presentation
Option D:	session

4.	_____ is the simplest topology that is 2-connected, that is, provides two separate paths between any pair of nodes that do not have any nodes or links in common except the source and destination nodes.
Option A:	bus
Option B:	ring
Option C:	star
Option D:	mesh
5.	The network layer is responsible for routing_____ from the source to destination
Option A:	Frame
Option B:	bit
Option C:	packet
Option D:	message
6.	In _____any random station can transmit the data at the beginning of any random time slot
Option A:	Carrier sense multiple access with collision detection (CSMA/CD)
Option B:	Slotted ALOHA
Option C:	Carrier sense multiple access (CSMA)
Option D:	Pure ALOHA
7.	_____ is used for allocating a separated space to users in wireless networks
Option A:	SDMA
Option B:	CDMA
Option C:	TDMA
Option D:	FDMA
8.	_____ is a common type of cable used for transmitting data over long distances. It can carry either an analog or digital signal and they are most commonly used to transmit cable TV and Internet signals

Option A:	twisted pair
Option B:	coaxial
Option C:	fiber-optic
Option D:	satellite
9.	A _____ is hardware device designed to receive, analyze and move incoming packets to another network
Option A:	router
Option B:	hub
Option C:	repeater
Option D:	switch
10.	_____ is the process of adding 1 extra byte whenever there is a flag or escape character in the text.
Option A:	Byte stuffing
Option B:	Bit stuffing
Option C:	word stuffing
Option D:	double word stuffing
11.	In _____ the size of the send window is 1.
Option A:	Selective Repeat ARQ
Option B:	Go-Back-N Protocol ARQ
Option C:	Stop-and-Wait ARQ
Option D:	Simplest
12.	The _____ is a three-way hand-shaking authentication protocol that provides greater security
Option A:	Password Authentication Protocol (PAP)
Option B:	Challenge Handshake Authentication Protocol (CHAP)
Option C:	High-level Data Link control
Option D:	Point-to-Point Protocol (PPP).

13.	IP fragmentation is done at
Option A:	gateway
Option B:	repeater
Option C:	switch
Option D:	router
14.	The IP address 10.11.12.13 lies in which class
Option A:	class A
Option B:	class B
Option C:	class C
Option D:	class D
15.	The header size of a UDP packet is _____
Option A:	8 bytes
Option B:	8 bits
Option C:	16 bytes
Option D:	124 bytes
16.	_____ flag is set for terminating the connection in the TCP segment header
Option A:	URG
Option B:	ACK
Option C:	FIN
Option D:	PSH
17.	_____ is a combination of Socket address
Option A:	IP address and physical address
Option B:	IP Address and Port address
Option C:	Port address and Physical address
Option D:	IP address and a special address

18.	_____ is a network protocol for transferring copies of files from one computer to another.
Option A:	SMTP
Option B:	HTTP
Option C:	FTP
Option D:	SIP
19.	An application layer protocol used for sending electronic mail is _____
Option A:	SMTP
Option B:	HTTP
Option C:	FTP
Option D:	SIP
20.	The _____ is the phonebook of the Internet
Option A:	SMTP
Option B:	HTTP
Option C:	FTP
Option D:	DNS

Q2.	Solve any TWO. (10 Marks each)	20 Marks
------------	--	-----------------

A	Explain OSI model with diagrams.
B	Compare different transmission media with respect to speed, bandwidth, attenuation and cost.
C	Compare Go back-N ARQ and Selective reject ARQ protocols.

Q3.	Solve any TWO. (10 Marks each)	20 Marks
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A	Explain IPv4 and IPv6 protocols. Make a comparison.
B	Explain connection management in TCP and congestion control in TCP
C	Describe the features of HTTP,FTP and SMTP protocols.

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examination Commencing from 7th January 2021 to 20th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev2012
Examination: BE Semester VII
Course Code: EXC704 and Course Name: Computer Communication Networks

Time: 2 hour

Max. Marks: 80

Q1:

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

Q14.	A
Q15.	A
Q16.	C
Q17.	B
Q18.	C
Q19.	A
Q20.	D

Q2 & Q3

No numericals. Only Descriptive questions.

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev2012

Examination: BE Semester VII

Course Code: EXC7051 and Course Name: Digital Image Processing(DIP)

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following is not an Image type?
Option A:	Monochrome
Option B:	Grey Scale
Option C:	Vidicon
Option D:	Colour
2.	All the wall paper Images that your computer has are -----
Option A:	TIFF Images
Option B:	BMP Images
Option C:	EPS Images
Option D:	PICT Images
3.	From the following which is not an example of point processing
Option A:	Digital Negative
Option B:	Bit plane slicing
Option C:	Contrast Stretching
Option D:	Smoothing
4.	What is the tool used in tasks such as zooming, shrinking and rotating??
Option A:	Filters
Option B:	Interpolation
Option C:	Sampling
Option D:	Quantization
5.	An image contains noise having appearance as black and white dots superimposed on the image is-----
Option A:	Gaussian noise
Option B:	Gamma Noise
Option C:	Uniform Noise
Option D:	Salt-and-pepper noise
6.	Gray level image segmentation is generally based on -----
Option A:	Only Similarity
Option B:	Continuity and similarity
Option C:	Discontinuity and similarity

Option D:	Only Continuity
7.	Laplacian is a
Option A:	Second order derivative filter
Option B:	First order derivative filter
Option C:	Canny operator
Option D:	Sobel operator
8.	Example of similarity approach in image segmentation is
Option A:	edge based segmentation
Option B:	region based segmentation
Option C:	thresholding based segmentation
Option D:	boundary based segmentation
9.	image morphology is an important tool in extraction of image
Option A:	Colour
Option B:	Intensities
Option C:	Nature
Option D:	Features
10.	_____ is a process of removing of the extra tail pixels in an image
Option A:	Erosion
Option B:	Dilation
Option C:	hit-miss transform
Option D:	Pruning
11.	DWT stands for
Option A:	Discrete wavelet transform
Option B:	Discrete wavelet transformation
Option C:	Digital wavelet transform
Option D:	Digital wavelet transformation
12.	Which of the following is not a property of 2D-DFT
Option A:	Symmetric
Option B:	Periodic extensions
Option C:	Sampled Fourier transform
Option D:	Linearity
13.	Radix - 2 FFT algorithm performs the computation of DFT in
Option A:	$N/2 \log_2 N$ multiplications and $2 \log_2 N$ additions
Option B:	$N/2 \log_2 N$ multiplications and $N \log_2 N$ additions
Option C:	$\log_2 N$ multiplications and $N/2 \log_2 N$ additions
Option D:	$N \log_2 N$ multiplications and $N/2 \log_2 N$ additions
14.	Discrete cosine transforms (DCTs) express a function or a signal in terms of
Option A:	Sum of cosine functions oscillating at same sampling intervals
Option B:	Sum of cosine functions oscillating at same frequencies
Option C:	Sum of cosine functions at different sampling intervals
Option D:	Sum of cosine functions oscillating at different frequencies

15.	Transform coding is
Option A:	Spatial process
Option B:	Differential process
Option C:	Nonlinear process
Option D:	Linear process
16.	transform kernel is not separable and symmetric
Option A:	Discrete Cosine Transform
Option B:	Discrete Laplace Transform
Option C:	Discrete Fourier Transform
Option D:	Discrete Walsh Transform
17.	Coding redundancy mechanisms is based on
Option A:	Pixels
Option B:	Matrix
Option C:	Intensity
Option D:	Coordinates
18.	Every run length pair introduces
Option A:	Pixels
Option B:	Matrix
Option C:	Frames
Option D:	Intensity
19.	Mathematically expressed information lost is known as
Option A:	Markov
Option B:	finite memory source
Option C:	Fidelity criteria
Option D:	noiseless theorem
20.	Which of the following is not a type of data redundancy
Option A:	Coding
Option B:	Spatial
Option C:	Temporal
Option D:	Facsimile

Q2	Solve any Two. (10 Marks each)	20 Marks							
A	The histogram of a digital image with 3 bits per pixel is as shown. Perform histogram equalization. Draw the histograms before and after equalization. [10M]								
	Grey level	0	1	2	3	4	5	6	7
	No. of Pixels	0	100	400	50	200	50	200	0
B	Explain region-based segmentation based on similarities								

C	<p>Find DFT for given image 4×4 image</p> <table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>1</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>2</td> </tr> <tr> <td>2</td> <td>3</td> <td>4</td> <td>3</td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>2</td> </tr> </table>	0	1	2	1	1	2	3	2	2	3	4	3	1	2	3	2
0	1	2	1														
1	2	3	2														
2	3	4	3														
1	2	3	2														

Q3	Solve any Two (10 Marks each)	20 Marks																																																																																																						
A	<p>Perform dilation on given 10×10 image</p> <table border="1"> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> </table> <p>Using structuring element</p> <table border="1"> <tr> <td>1</td> </tr> <tr> <td>1</td> </tr> </table>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	0	0	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
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B	Explain different types of image file format																																																																																																							
C	Write a note on image compression model																																																																																																							

University of Mumbai
Examination 2020 under Cluster 06
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Program: **Electronics Engineering**

Curriculum Scheme: Rev2012

Examination: BE Semester VII

Course Code: EXC7051 and Course Name: Digital Image Processing (DIP)

Time: 2 hour

Max. Marks: 80

Q1:

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

Q2.A

r_k	n_k	$p_r(r_k)$	CDF	$s_k = (L-1)$ CDF	S'_k
0	0	0.00	0	0	0
1	100	0.10	0.10	0.7	1
2	400	0.40	0.50	3.5	4
3	50	0.05	0.55	3.85	4
4	200	0.20	0.75	5.25	5
5	50	0.05	0.80	5.6	6
6	200	0.20	1.00	7	7
7	0	0.00	1.00	7	7

$$\sum n_k = 1000$$

s_k	n_k
0	0
1	100
2	0
3	0
4	450
5	200
6	50
7	200

Q2. B. Theory question

Q2.C.DFT standard matrix is

1	1	1	1
1	-j	-1	J
1	-1	1	-1
1	j	-1	-j

The final output is

32	-8	0	-8
-8	0	0	0
0	0	0	0
-8	0	0	0

Q3.A The dilated output image is

0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	0	0	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0	0	0
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Q3.B. Theory question

Q3.C. Theory question

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 07th January 2021 to 20th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2012
Examination: BE Semester VII
Course Code: EXC7052 and Course Name: Artificial Intelligence

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.	The value of Log sigmoid transfer function used in neural network varies in the range
Option A:	(-1,1)
Option B:	(0,1)
Option C:	(-2,2)
Option D:	(-10,10)
2.	“John is very short”. Here very short can be represented by
Option A:	Fuzzy set
Option B:	Classical set
Option C:	Crisp set
Option D:	Both Fuzzy set and Crisp set
3.	The axon - dendrite contact is called
Option A:	Dendrite
Option B:	Synapse
Option C:	Soma
Option D:	Neuron
4.	Widrow-Hoff learning rule is a
Option A:	Supervised learning rule
Option B:	Unsupervised learning rule
Option C:	Competitive learning rule
Option D:	Hebbian learning rule
5.	In single layer discrete perceptron training algorithm if η is the learning constant ,d is the desired , o is the actual output and X is the input then the weights are updated as
Option A:	$W_{new} = W_{old} + \eta(d-o)X$
Option B:	$W_{new} = W_{old} - \eta(d-o)X$
Option C:	$W_{new} = W_{old} + \eta(d+o)X$
Option D:	$W_{new} = W_{old} * \eta(d-o)X$
6.	In Maxnet during training process the weight

Option A:	Increases
Option B:	Decreases
Option C:	Remains fixed
Option D:	Depends on learning rate
7.	The Hamming distance between the two given vectors $X=[0\ 0\ 1\ 0\ 1\ 1\ 0]$ and $Y=[1\ 1\ 1\ 0\ 0\ 0\ 1]$ is
Option A:	4
Option B:	7
Option C:	6
Option D:	5
8.	Which of the following can be used for clustering of data?
Option A:	Single layer perceptron
Option B:	Multi-layer perceptron
Option C:	Self organizing maps
Option D:	Hopfield network
9.	In competitive learning, the winning neuron has
Option A:	The maximum Euclidean distance between the input vector and weight vector
Option B:	The minimum Euclidean distance between the input vector and weight vector
Option C:	Euclidean distance equal to 1
Option D:	The minimum dot product of the input vector and weight vector
10.	Perceptron can learn
Option A:	AND and XOR logic
Option B:	AND and OR logic
Option C:	XOR and OR logic
Option D:	XOR logic only
11.	The Lambda –cut set for $\lambda=0.3$ for the given fuzzy set $A = \{(a, 1), (b, 0.3), (c, 0.6), (d, 0.9), (e, 0.2)\}$
Option A:	$\{(a, 1), (b, 0.3), (c, 1), (d, 1), (e, 1)\}$
Option B:	$\{(a, 1), (b, 1), (c, 1), (d, 1), (e, 0)\}$
Option C:	$\{(a, 0), (b, 1), (c, 0), (d, 0), (e, 1)\}$
Option D:	$\{(a, 0.3), (b, 0.3), (c, 0.3), (d, 0.3), (e, 0.3)\}$
12.	In KSOM the weights of the winning node is given by
Option A:	$W_{ij}(\text{new}) = W_{ij}(\text{old}) + \alpha(x_i - W_{ij}(\text{old}))$
Option B:	$W_{ij}(\text{new}) = W_{ij}(\text{old}) + \alpha(x_i + W_{ij}(\text{old}))$
Option C:	$W_{ij}(\text{new}) = 0.5W_{ij}(\text{old}) + \alpha(x_i - W_{ij}(\text{old}))$
Option D:	$W_{ij}(\text{new}) = 0.5W_{ij}(\text{old})$
13.	The size of the weight vector for clustering 6 input vectors into 2 clusters is given by

Option A:	6 X 1
Option B:	6 X 6
Option C:	2 X 2
Option D:	6 X 2
14.	A set of input vectors $\{(1\ 1\ 0\ 0);(0\ 1\ 1\ 1);(0\ 1\ 1\ 0)\}$ are to be clustered using ART1 algorithm, assuming a single node in the active set the bottom up weights is initialized as
Option A:	$[1/5,1/5,1/5]^T$
Option B:	$[1/5\ 1/5\ 1/5; 1/5\ 1/5\ 1/5; 1/5\ 1/5\ 1/5]$
Option C:	$[1/5\ 1/5\ 1/5\ 1/5]$
Option D:	5
15.	Only Reflexivity and Symmetry properties are satisfied by
Option A:	Fuzzy tolerance relation
Option B:	Fuzzy Equivalence relation
Option C:	Fuzzy composition relation
Option D:	Fuzzy inference relation
16.	Lyapunov Energy function is used for
Option A:	The stability analysis of a BAM network
Option B:	The stability analysis of a Perceptron network
Option C:	The stability analysis of a Maxnet network
Option D:	The stability analysis of a KSOM network
17.	Stability plasticity dilemma can be better tackled in
Option A:	Adaline
Option B:	Madaline
Option C:	ART1
Option D:	Hamming network
18.	In EBPN the weights are updated in
Option A:	Forward pass only
Option B:	Backward pass only
Option C:	Both forward and backward passes
Option D:	Hidden layer only
19.	Radial Basis Function network is
Option A:	A supervised learning network
Option B:	An unsupervised learning network
Option C:	An auto associative memory network
Option D:	A reinforcement learning network
20.	Center of sum is for
Option A:	Fuzzification
Option B:	Inference
Option C:	Tolerance
Option D:	Defuzzification

Q2.	Solve any Two. (10 Marks each)	20 Marks
A	Explain in detail any two learning rules.	
B	Give the summary of the single layer discrete perceptron training algorithm.	
C	Construct a Kohonen self organizing map to cluster the four given input vectors [0 0 1 1],[1 0 0 0],[0 1 1 0] and [0 0 0 1] for one epoch. The number of clusters to be formed is two. Assume the initial learning rate is 0.5 and initial weight vector as $W = [0.2 \ 0.9 \ 0.4 \ 0.7 \ 0.6 \ 0.5 \ 0.8 \ 0.3]$	

Q3.	Solve any Two. (10 Marks each)	20 Marks
A	Explain Adaline network Training algorithm.	
B	Let R and S be two fuzzy relations defined as follows. Obtain the fuzzy relation, T, using 1. Max min composition 2. max-product composition $R = [0.6 \ 0.3 \ 0.2 \ 0.9]$ $S = [1 \ 0.5 \ 0.3 \ 0.8 \ 0.4 \ 0.7]$	
C	Summarize the important learning factors affecting the convergence of Back Propagation networks.	

University of Mumbai
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Curriculum Scheme: Rev 2012
Examination: BE Semester VII
Course Code: EXC7052 and Course Name: Artificial Intelligence

Time: 2 hour

Max. Marks: 80

Q1:

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

Important steps and final answer for the questions involving numerical example

Q2(C):

Updated weight matrix after presenting First input vector

$$W=0.1 \ 0.9 \ 0.2 \ 0.7 \ 0.8 \ 0.5 \ 0.9 \ 0.3$$

Updated weight matrix after presenting Second input vector

$$W = 0.1 \ 0.95 \ 0.2 \ 0.35 \ 0.8 \ 0.25 \ 0.9 \ 0.15$$

Updated weight matrix after presenting Third input vector

$$W = 0.05 \ 0.95 \ 0.6 \ 0.35 \ 0.9 \ 0.25 \ 0.45 \ 0.15$$

Updated weight matrix after presenting fourth input vector

$$W = 0.025 \ 0.95 \ 0.3 \ 0.35 \ 0.45 \ 0.25 \ 0.475 \ 0.15$$

Q3(B):

1. Max min composition

$$T = 0.6 \ 0.5 \ 0.3 \ 0.8 \ 0.4 \ 0.7$$

2. Max product composition

$$T = 0.6 \ 0.3 \ 0.21 \ 0.72 \ 0.36 \ 0.63$$

University of Mumbai
Examination 2020 under Cluster 06
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Program: **Electronics Engineering**
Curriculum Scheme: Rev 2012
Examination: BE Semester VII
Course Code: EXC7053 and Course Name: ASIC Verification
Time: 2 hour Max. Marks: 80

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	In continuous assignment LHS can be
Option A:	Scalar net
Option B:	Vector net
Option C:	Concatenation of both
Option D:	Vector reg
Q2.	To get a new semaphore, but not block it then what can be used
Option A:	New
Option B:	Get
Option C:	try get
Option D:	Create
Q3.	Which flow verification follows?
Option A:	Waterfall flow
Option B:	Downfall flow
Option C:	Top down flow
Option D:	Bottom up flow
Q4.	1st step of test bench verification involves following steps
Option A:	Generate task
Option B:	Generate delay
Option C:	Generate function
Option D:	Generate stimulus
Q5.	Simulation phase involves following steps
Option A:	Build , task
Option B:	Build, run , share
Option C:	Build, run , wrap up
Option D:	Run, build

Q6.	Unsigned 16 bits can be represented in system verilog as
Option A:	bit [2 :0] my-reg.
Option B:	bit [4:0] my-reg.
Option C:	bit [15:0] my-reg.
Option D:	bit [8:0] my –reg.
Q7.	Which operators has highest precedence in Verilog
Option A:	Unary
Option B:	Multiplication
Option C:	Addition
Option D:	Conditional
Q8.	While operating in a loop, if a programmer wants to leave the loop immediately which functions has to be used?
Option A:	Break
Option B:	Continue
Option C:	Exit
Option D:	Return
Q9.	Which keyword has to be used if a routine should not change the array values
Option A:	Const ref type
Option B:	Int
Option C:	Const
Option D:	Val
Q10.	The system task returns an integer scaled to the time precision of the current module, but missing any fractional units
Option A:	time
Option B:	realtime
Option C:	constanttime
Option D:	variabletime
Q11.	Target to the compilation of Verification process is
Option A:	Functional Coverage 100% and code coverage is not considered
Option B:	Functional Coverage 100% and code coverage is 100%
Option C:	Code coverage should be 100% and Functional Coverage is not considered.
Option D:	If all the test cases in
Q12.	An intelligent bundle of signals contains:
Option A:	Connectivity
Option B:	Synchronization
Option C:	Functionality
Option D:	All of the above
Q13.	fork...join executes the statements in
Option A:	Sequential
Option B:	Parallel

Option C:	Randomly
Option D:	Sequential and Parallel
Q14.	<pre> class Packet; rand bit [31:0] src, dst, data[8]; randc bit [7:0] kind; constraint c {src> 10; src< 15;} endclass Packet p; initial begin p = new; // Create a packet assert (p.randomize()); transmit(p); end </pre> <p>Src variable will choose the value between</p>
Option A:	10-14
Option B:	10-15
Option C:	11-14
Option D:	11-15
Q15.	<pre> class bounds; rand int size; intmax_size = 100; constraint c_size { size inside {[1:max_size]}; } endclass </pre> <p>By varying max_size, value of size can lie between</p>
Option A:	1-100
Option B:	1-99
Option C:	1- max_size
Option D:	2 - max_size
Q16.	A task can have arguments of type
Option A:	Input only
Option B:	Output only
Option C:	Both input and output
Option D:	All input, output and inout
Q17.	Reuse of same code to take on many different behaviors based on the type of object at hand is called as
Option A:	Abstraction
Option B:	Polymorphism
Option C:	Encapsulation
Option D:	Inheritance

Q18.	In System Verilog, if a programmer wants to call a function and ignore its return value programmer has to cast the result to
Option A:	Void
Option B:	Nullify
Option C:	Main
Option D:	Float
Q19.	<pre> initial begin \$display("@%0d: start fork...join_none example",\$time); #10 \$display("@%0d: sequential after #10", \$time); fork \$display("@%0d: parallel start", \$time); #50 \$display("@%0d: parallel after #50", \$time); #10 \$display("@%0d: parallel after #10", \$time); begin #30 \$display("@%0d: sequential after #20", \$time); #10 \$display("@%0d: sequential after #10", \$time); end join_none \$display("@%0d: after join_none", \$time); #80 \$display("@%0d: final after #80", \$time); end after join none will execute at time unit </pre>
Option A:	60
Option B:	50
Option C:	90
Option D:	10
Q20.	The task <i>\$stop</i> is provided to
Option A:	End simulation
Option B:	Suspend simulation
Option C:	Exit simulation
Option D:	Not related to simulation

Q2	Solve any Two. (10 Marks each)	20 Marks
A	What is Randomization and why it is required in design verification? Give detail explanation with suitable example.	
B	Draw the architecture and highlight the important features of Virtex 7 family.	
C	Explain various data types in verilog? Write verilog code to swap contents of 2 registers with and without a temporary register.	

Q3.	Solve any Two. (10 Marks each)	20 Marks
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A	What are semaphores? Also, explain the difference between semaphore and monitor.
B	What are the different types of coverage? Explain line and toggle coverage with suitable example.
C	Explain various fork join statements supported in verilog.

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examination Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2012

Examination: BE Semester VII

Course Code:EXC7053 and Course Name: ASIC Verification

Time: 2 hour

Max. Marks: 80

Q.1:

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

Q18.	A
Q19.	D
Q20.	A

Q.2. c. always @ (posedge clock)

```
begin
  temp = b;
  b = a;
  a = temp;
end
```

Without temp register (using non-blocking assignment)

always @ (posedge clock)

```
begin
  a <= b;
  b <= a;
end
```

University of Mumbai
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(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 7th January 2021 to 20th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2012
Examination: BE Semester VII
Course Code: EXC7054 Course Name: Optical Fiber Communication
Time: 2 hour Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	What is the numerical aperture of silica fiber with $n_1=1.48$ and $n_2=1.46$?
Option A:	0.2525
Option B:	0.2425
Option C:	0.2524
Option D:	0.2424
2.	For V number, $V=42$ the number of modes for a graded index fiber is
Option A:	441
Option B:	431
Option C:	882
Option D:	1763
3.	_____ splicing technique yields permanent joint.
Option A:	connector
Option B:	V-groove mechanical
Option C:	Fusion
Option D:	splitter
4.	Which of the following statements is correct?
Option A:	The optical bandwidth is less than the electrical bandwidth.
Option B:	The optical bandwidth is same as the electrical bandwidth.
Option C:	There is no relation between the optical bandwidth and the electrical bandwidth.
Option D:	The optical bandwidth is greater than the electrical bandwidth.
5.	The radiative and nonradiative recombination lifetimes of the minority carriers in the active region of a double heterojunction LED are 60ns and 100ns respectively. The internal quantum efficiency of the device is _____
Option A:	37.5
Option B:	0.625
Option C:	0.6
Option D:	0.375
6.	In an avalanche photodiode, the dark current and the quantum noise _____ by the multiplication process.

Option A:	increases
Option B:	decreases
Option C:	remains unchanged
Option D:	becomes half
7.	Material dispersion is caused by the
Option A:	Wavelength dependence of the index of refraction
Option B:	Wavelength independence of the index of refraction
Option C:	Dependence of the propagation constant on the mode number
Option D:	Independence of the propagation constant on the mode number
8.	_____ is the width of the range of wavelengths emitted by the light source.
Option A:	Bandwidth
Option B:	Luminescence
Option C:	Spectrum
Option D:	Spectral width
9.	Which light emitter is preferred for high speed data in a fiber-optic system?
Option A:	Incandescent
Option B:	LED
Option C:	Neon
Option D:	Laser
10.	The photonic layer of the SONET is similar to the _____ of OSI model.
Option A:	network layer
Option B:	data link layer
Option C:	physical layer
Option D:	Presentation Layer
11.	The Power Penalty in an optical link result in
Option A:	Lower BER
Option B:	Same BER
Option C:	Zero BER
Option D:	Higher BER
12.	A 2×2 fiber coupler has an input power level of 200 μW. The output power in other two ports are 90 μW and 85 μW. What is coupling ratio for this optical fiber.
Option A:	48.6%
Option B:	30%
Option C:	85%
Option D:	90%
13.	Electrical devices in optical network are basically used for
Option A:	Signal degradation
Option B:	Node transfer
Option C:	Signal control
Option D:	Amplification
14.	The term dispersion describes the process of

Option A:	separating light into its component frequencies
Option B:	reflecting light from a smooth surface
Option C:	the process by which light is absorbed by an uneven rough surface light scattering
Option D:	Attenuation of light
15.	In which of the following fabrication process, glass vapor particles, arising from reaction of constituent metal halide gasses and oxygen flow through inside of revolving silica tube
Option A:	OVPO
Option B:	VPAD
Option C:	MCVD
Option D:	Direct Melt methods
16.	The absence of _____ in LEDs limits the internal quantum efficiency.
Option A:	Proper semiconductor
Option B:	Adequate power supply
Option C:	Optical amplification through stimulated emission
Option D:	Optical amplification through spontaneous emission
17.	Which is not a possible cause of optical fiber loss?
Option A:	Impurities
Option B:	Glass attenuation
Option C:	Stepped index operation
Option D:	Microbending
18.	The network structure formed due to the interconnectivity patterns is known as a
Option A:	Network
Option B:	Struck
Option C:	Topology
Option D:	D-pattern
19.	Optical Isolators are used to
Option A:	Modulate the light
Option B:	Block any light moving in backward direction
Option C:	Optical to Electrical conversion
Option D:	Amplify the light signal
20.	WDM is an analog multiplexing technique to combine
Option A:	Magnetic signals
Option B:	Electromagnetic signals
Option C:	Digital signals
Option D:	Optical signals

Q2	Solve any Two. (10 Marks each)	20 Marks
A	Explain the working of surface emitting LED.	
B	SONET/SDH frame structure in detail.	
C	Explain OVPO process of fiber fabrication.	

Q3	Solve any Two. (10 Marks each)	20 Marks
A	Explain Fabry-Perot amplifier and Travelling-Wave amplifier in detail.	
B	Explain mechanical splicing and fusion splicing with a neat diagram.	
C	Explain how a Graded index fiber reduces intermodal dispersion?	

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Examination: BE Semester VII
Course Code: EXC7054 Course Name: Optical Fiber Communication
Time: 2 hour Max. Marks: 80

Q1:

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

Important steps and final answer for the questions involving numerical example

Q2(A): N.A.