

**University of Mumbai**

**Examination 2020 under cluster 5 (Lead College: APSIT, Thane)**

**Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**

Program: Electronics and Telecommunications Engineering

Curriculum Scheme: Rev2016

Examination: BE Semester: VII

Course Code: ECC701 and Course Name: Microwave Engineering

Time: 2 hour

Max. Marks: 80

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<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	What is Reflex klystron?
Option A:	An amplifier
Option B:	An attenuator
Option C:	An oscillator
Option D:	A filter
2.	The principle on which a klystron operates is
Option A:	Amplitude modulation
Option B:	Velocity modulation
Option C:	Pulse modulation
Option D:	Frequency modulation
3.	What is a travelling wave tube?
Option A:	Oscillator
Option B:	Tuned amplifier
Option C:	Wide band amplifier
Option D:	Narrow band amplifier
4.	The best medium for handling the large microwave power is-----
Option A:	Coaxial cable
Option B:	Strip lines
Option C:	Rectangular waveguides
Option D:	Micro striplines

5.	The disadvantage of microstrips with respect to strip line circuit is-----
Option A:	Do not let themselves to be printed circuits
Option B:	Are more likely to radiate
Option C:	Are more expensive and complex to manufacture
Option D:	Are bulkier
6.	HEMT ( High Electron Mobility Transistor ) used in microwave circuit is a-----
Option A:	Source
Option B:	Detector
Option C:	High power amplifier
Option D:	Low noise amplifier
7.	The Waveguide section will act as a-----in microwave circuits.
Option A:	Low pass filter
Option B:	High pass filter
Option C:	Band pass filter
Option D:	Band reject filter
8.	What is the biggest advantage of the TRAPATT diode over an IMPATT diode?
Option A:	Low noise
Option B:	Ability to operate at high frequency
Option C:	High efficiency
Option D:	Lesser sensitivity to harmonics
9.	PIN diode is suitable for use as a-----
Option A:	Microwave switch
Option B:	Microwave mixed diode
Option C:	Microwave detector
Option D:	Microwave source
10.	A magic tee is-----
Option A:	Modification of E- plane tee
Option B:	Modification of H- plane tee
Option C:	Combination of E- plane and H- plane
Option D:	Two E- plane tees connected in parallel
11.	Travelling wave tube parametric amplifiers are used to----
Option A:	Provide a greater gain
Option B:	Reduce the number of varactor diodes required

Option C:	Avoid the need of cooling
Option D:	Provide a greater bandwidth
12.	Which of the following is not possible in a circular waveguide
Option A:	TE <sub>10</sub>
Option B:	TE <sub>01</sub>
Option C:	TE <sub>11</sub>
Option D:	TE <sub>12</sub>
13.	What is the maximum theoretical output circuit efficiency of a double resonator klystron amplifier?
Option A:	25%
Option B:	50%
Option C:	58%
Option D:	85%
14.	Why is an attenuator used in a travelling wave tube?
Option A:	To help bunching
Option B:	To prevent oscillations
Option C:	To prevent saturation
Option D:	To increase gain
15.	A transferred electron device is-----
Option A:	BARITT diode
Option B:	IMPATT diode
Option C:	TRAPATT diode
Option D:	Gunn diode
16.	A Gunn diode is a negative resistance device, Which is used as a source of microwaves. What is the number of p-n junctions?
Option A:	1
Option B:	2
Option C:	3
Option D:	0
17.	Which of the following materials are generally preferred for waveguides?
Option A:	Cast iron and Steel
Option B:	Non metallic solids including plastic
Option C:	High carbon steel & Vanadium steel
Option D:	Brass & Aluminum

18.	What is the primary purpose of the helix in a travelling wave tube?
Option A:	To reduce noise figure
Option B:	To prevent the electron beam from spreading in the long tube
Option C:	To reduce the axial velocity of the RF field
Option D:	To ensure broad band operation
19.	In a magnetron why does the electrons travel in a cycloidal path
Option A:	Strong field is supplied by the permanent Magnet
Option B:	The cathode is positive
Option C:	The anode is negative
Option D:	The cavities are resonant
20.	What is the frequency at which microwave ovens operate?
Option A:	50 $\mu$ Hz
Option B:	2.45 GHz
Option C:	3.3 GHz
Option D:	4.5 GHz

<b>Q2</b>	
A	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Explain different modes in Gunn diode.
ii.	Explain the operation of 2- hole directional coupler with the help of s- matrix.
iii.	Explain Impedance measurement technique in microwave.
B	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	An air filled circular waveguide having an inner radius of 1 cm is excited in the dominant mode at 10 GHz. Find (i) The cut off frequency of the dominant mode (ii) Guide wavelength (iii) Wave impedance. Find the bandwidth for operation in dominant mode only.
ii.	Derive equation for phase velocity, cut off frequency, cut off wavelength and field equation for rectangular waveguide.

<b>Q3.</b>	
A	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>

i.	Describe operation of Isolator using Faraday's rotation principle.
ii.	Explain amplification process in travelling wave tube.
iii.	Explain significance of RHW theory in Gunn diode.
<b>B</b>	<b>Solve any One <span style="float: right;">10 marks each</span></b>
i.	Why is phase focusing required in magnetron? What is back heating? How can it be controlled?
ii.	A travelling wave tube has following characteristics Beam voltage $V_0 = 3\text{kV}$ , Beam current : 10 mA , frequency $f = 8.5\text{ GHz}$ , Circuit length $N = 42$ , Characteristic Impedance = $120\ \Omega$ . Determine (i) A gain parameter (ii) Power gain (iii) All four propagation constants.

## University of Mumbai

### Examination 2020 under cluster **\_5\_ (Lead College: APSIT)**

Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: Electronics and Telecommunication Engineering (CBCGS)

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ECC702 and Course Name: Mobile Communication Systems

Time: 2 hours

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	----- is the major concern in frequency reuse.
Option A:	System noise
Option B:	Co-channel Interference
Option C:	Intermodulation
Option D:	Adjacent channel interference
2.	Relation between cluster size (N) and system capacity (C)
Option A:	Capacity increases with increase in cluster size
Option B:	Capacity decreases with increase in cluster size
Option C:	Capacity will remain same
Option D:	Capacity decreases with decrease in cluster size
3.	If frequency spectrum of 25Mhz is allocated for duplex service with user simplex BW of 20 khz, calculate no. of duplex channels.
Option A:	250
Option B:	625
Option C:	1000
Option D:	700
4.	If a call request rate is 20 calls/hour and average holding time of call is 2 minutes, the traffic intensity offered by each user is ____ .
Option A:	0.66 Erlang
Option B:	0.76 Erlang
Option C:	0.56 Erlang
Option D:	0.60 Erlang
5.	Frequency band for IS-95 CDMA system
Option A:	824MHZ to 849MHz (Uplink) and 869MHz to 894MHz(downlink)
Option B:	824MHZ to 449MHz (downlink) and 869MHz to 894MHz(uplink)
Option C:	845MHZ to 469MHz (Uplink) and 889MHz to 912MHz(downlink)
Option D:	890MHZ to 915MHz (Uplink) and 860MHz to 885MHz(downlink)
6.	Fading that occurs due to Rapid fluctuations of received signal strength over

	short time intervals
Option A:	Large scale fading
Option B:	Small scale fading
Option C:	Noise
Option D:	Interference
7.	In CDMA 2000 functions of AAA
Option A:	Authentication, Authorization and Accounting
Option B:	Authentication, Accessibility and Accounting
Option C:	Adaptability, Authorization and Accounting
Option D:	Authentication, Adjustment and Accounting
8.	Doppler spread and coherence time defines
Option A:	Frequency varying nature of the channel
Option B:	Time varying nature of the channel
Option C:	It reduces the BW of channel
Option D:	Improves system capacity
9.	Duplexing used in WCDMA
Option A:	FDD
Option B:	TDD
Option C:	FDD and TDD
Option D:	CDMA
10.	Line of Sight (LOS) component is present in propagation path it is
Option A:	Rayleigh fading
Option B:	Rician fading
Option C:	Fast fading
Option D:	Slow fading
11.	Max. data rate in WCDMA
Option A:	14.4kbps
Option B:	512 kbps
Option C:	2Mbps
Option D:	9.6kbps
12.	Relative motion between base station & mobile station causes random frequency modulation called as _____ .
Option A:	Doppler shift
Option B:	Time shift
Option C:	Coherence Time
Option D:	Multipath fading
13.	A cell-site transmitter power is 10W, frequency of transmission is 950MHz, determine the path loss at 4km in free space.
Option A:	106dB
Option B:	108dB
Option C:	104dB

Option D:	110dB
14.	Modulation technique used in GSM is _____ .
Option A:	QPSK
Option B:	OQPSK
Option C:	GMSK
Option D:	BPSK
15.	In CDMA 2000 user data rate is 9.6kbps and it is spreaded with a chip rate of 3.84Mcps, the spreading factors will be ____ .
Option A:	400
Option B:	450
Option C:	350
Option D:	475
16.	The number of cells in a cluster formed by $i = 3$ and $j = 3$
Option A:	27
Option B:	19
Option C:	9
Option D:	14
17.	It improves capacity (data rate) by combining array gain, diversity gain and by minimizing interferences
Option A:	Power Amplifier
Option B:	Smart antenna technology
Option C:	Equalizer
Option D:	Dipole antenna
18.	Which of the following is not the characteristics of 4G?
Option A:	Uniform service with high data rate
Option B:	Ubiquitous Mobile access
Option C:	Diverse User devices
Option D:	Data rate is constant
19.	In MIMO, which factor enhances the system performance?
Option A:	The size of antenna
Option B:	The number of transmitting and receiving antennas
Option C:	The area of receive antennas
Option D:	The height of the antenna
20.	Calculate bit duration if there are 156 bits in one time slot in the GSM system.
Option A:	3.998 $\mu$ sec
Option B:	3.698 $\mu$ sec
Option C:	3.868 $\mu$ sec
Option D:	3.668 $\mu$ sec

<b>Q2 (A)</b>	<b>Solve any Two</b>	<b>5 marks each</b>
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i.	Explain concept of power control sub channel in IS-95 CDMA system.
ii.	Explain indoor propagation models
iii.	How the Umbrella cell approach reduces the number of handoffs.
<b>Q2 (B)</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	Compare IS-95, CDMA2000 and WCDMA with respect to frequency band, data rate, power control, channel BW, modulation techniques, multiple access technique and chip rate.
ii.	Draw and explain 3GPP LTE architecture.
<b>Q3 (A)</b>	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i	Explain power control in 3G Technology.
ii	How the RAKE receiver in the CDMA system improves S/N.
iii	If there are 50 channels in a cell to handle all the calls and the average call holding time is 100s per call. How many calls can be handled with GOS=2% and offered traffic load is 40 Erlang.
<b>Q3 (B)</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i	Draw GSM architecture with interfaces and explain.
ii	Explain multi antenna technique and how it improves quality of service.

**University of Mumbai**

**Examination 2020 under cluster 5 (Lead College: APSIT)**

**Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**

**Program: BE Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev-2016

Examination: BE Semester VII

Course Code: ECC703 and Course Name: Optical Communication

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	For total internal reflection inside the fiber, what must the relationship be between the angle of incidence ( $\theta_i$ ) and the critical angle ( $\theta_c$ )?
Option A:	$\theta_i < \theta_c$
Option B:	$\theta_i > \theta_c$
Option C:	$\theta_i = 90^\circ$
Option D:	$\theta_i = 0^\circ, \theta_c = 45^\circ$
2.	A certain fiber-optic cable has the following characteristics: $n_1 = 1.46$ and $n_2 = 1.43$ . What is the value of critical angle ( $\theta_c$ )?
Option A:	$78.36^\circ$
Option B:	$61.95^\circ$
Option C:	$18.1^\circ$
Option D:	$1.81^\circ$
3.	What are the three optical windows in fiber optics communication?
Option A:	750nm, 1350nm, 1600 nm
Option B:	850nm, 1300nm, 1550nm
Option C:	800mm, 1100mm, 1600mm
Option D:	850nm, 1300nm, 1450nm
4.	The ratio of speed of light in air to the speed of light in another medium is called as _____
Option A:	Speed factor
Option B:	Dielectric constant
Option C:	Reflection index
Option D:	Refractive index
5.	By creating a fiber with larger negative waveguide dispersion, the addition of waveguide and material dispersion can shift zero dispersion point to longer wavelength, such a fiber is known as _____. B
Option A:	Dispersion flattened fiber
Option B:	Dispersion shifted fiber
Option C:	Non zero dispersion shifted fiber
Option D:	Optimized fiber

6.	Four wave mixing is _____ order non linearity in optical fiber that is analogous to intermodulation distortion in electrical systems.
Option A:	First
Option B:	Second
Option C:	Third
Option D:	Fourth
7.	In graded index fiber, the refractive index
Option A:	Varies in core and constant in clad
Option B:	Varies in core and clad
Option C:	Varies in clad and constant in core
Option D:	Constant in Core and clad
8.	Which of the following is not related to Kerr effects?
Option A:	Self-phase modulation
Option B:	Cross-phase modulation
Option C:	four-wave mixing
Option D:	Stimulated Raman Scattering
9.	Types of linear scatterings are _____
Option A:	Brillouin and Raman
Option B:	Raman and Mie
Option C:	Brillouin and Mie
Option D:	Rayleigh and Mie
10.	If $P_{int} = 30$ mW and assume refractive index $n = 3.5$ . What is optical power emitted from LED?
Option A:	42.3 mW
Option B:	0.42 mW
Option C:	0.17 mW
Option D:	35.35 mW
11.	The 3 dB electrical bandwidth of an LED is 25 MHz. Determine 3 dB optical bandwidth $B_{opt}$
Option A:	14.43 MHz
Option B:	7.90 MHz
Option C:	43.30 MHz
Option D:	35.30 MHz
12.	The process which gives the laser its special properties as an optical source is:
Option A:	Dispersion
Option B:	Stimulated absorption
Option C:	Spontaneous emission
Option D:	Stimulated emission
13.	The high gain in Avalanche Photodiode (APD) is due to process called
Option A:	Impact ionization

Option B:	Stimulated radiation
Option C:	Spontaneous radiation
Option D:	Non-Linear effect
14.	The number of electron hole carrier pairs generated per incident photon is _____
Option A:	Optical Gain
Option B:	Responsivity
Option C:	Sensitivity
Option D:	Quantum efficiency
15.	The depletion region must be _____ to allow a large fraction of the incident light to be absorbed in the device(photodiode)
Option A:	Thin
Option B:	Thick
Option C:	Long
Option D:	Inactive
16.	Which optical devices are adopted or applicable for routing signals from one waveguide to another?
Option A:	Optical combiner
Option B:	Optical splitter
Option C:	Optical coupler
Option D:	Circulator
17.	In fiber fabrication process the thickness of fiber cable will depend on:
Option A:	Turning speed of take up wheel
Option B:	Thickness of preform
Option C:	Length of preform
Option D:	Diameter of preform
18.	In semiconductor optical amplifiers (SOA) _____ pumping is used.
Option A:	Electrical
Option B:	Optical
Option C:	Mechanical
Option D:	Laser
19.	What is total optical loss inside a 10 Km long optical fiber with attenuation factor of 3 dB/Km. The fiber consists of 9 splicing points, each contributing loss of 1 dB.
Option A:	30 dB
Option B:	9 dB
Option C:	39 dB
Option D:	21 dB
20.	Which of the following is not considered in rise time budget analysis?
Option A:	The transmitter rise time
Option B:	The group-velocity dispersion rise time & modal dispersion rise time of the fiber
Option C:	The receiver rise time

Option D:	The switching time
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<b>Q2 a)</b>	<b>Solve any Two Questions out of Three</b>	<b>05 marks each</b>
A	A multimode step index fiber with a core diameter of 80 $\mu\text{m}$ and a relative index difference of 1.5% is operating at a wavelength of 0.85 $\mu\text{m}$ . If the core refractive index is 1.48, estimate: (a) the normalized frequency for the fiber; (b) the number of guided modes.	
B	Derive the expression for pulse spreading in intermodal dispersion.	
C	Compare LED and Laser source.	
<b>Q2 b)</b>	<b>Solve any One Questions out of Two</b>	<b>10 marks each</b>
A	Explain any one fiber fabrication method with neat diagram.	
B	For a multimode fiber following parameters are recorded. i) LED with drive circuit has rise time of 15 ns ii) LED spectral width is 40 nm iii) Material dispersion related rise time degradation is 21 ns over 6 km link iv) Receiver bandwidth is 25 MHz v) Modal dispersion rise time is 3,9 ns Calculate system rise time.	

<b>Q3 a)</b>	<b>Solve any One Questions out of Two</b>	<b>10 marks each</b>
A	What is Fiber bragg grating? Give its application.	
B	What is optical amplifier? Compare different types of amplifiers.	
<b>Q3 b)</b>	<b>Solve any One Questions out of Two</b>	<b>10 marks each</b>
A	Explain Dispersion shifted fiber and Dispersion flattened fiber.	
B	Compare i) Intermodal and intramodal dispersion. ii) Step index fiber and Graded index fiber.	

**University of Mumbai**  
**Examination 2020 under cluster 5 (Lead College: APSIT)**

Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: Electronic and Telecommunication Engineering

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ECCDLO 7033 and Course Name: Internet Communication 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.	This layer works as Dialog controller in OSI model
Option A:	Session
Option B:	Application
Option C:	Presentation
Option D:	Transport
2.	Router operates at ..... layer of OSI reference model?
Option A:	Layer 2 (Data Link)
Option B:	Layer 3 (Network)
Option C:	Layer 1 (Physical)
Option D:	Layer 4 (Transport)
3.	Which transport layer protocol is used by DHCP?
Option A:	RSVP
Option B:	TCP
Option C:	DCCP
Option D:	UDP
4.	HTTP resources are located by
Option A:	Unique resource locator
Option B:	Unique resource identifier

Option C:	Uniform resource identifier
Option D:	Uniform resource indicator
5.	----- is used to check the safe and sound arrival of data in TCP.
Option A:	Packet
Option B:	Buffer
Option C:	Segment
Option D:	Acknowledgment
6.	Suppose a TCP connection is transferring a file of 1000 bytes. The first byte is numbered 10001. What is the sequence number of the segment if all data is sent in only one segment?
Option A:	10000
Option B:	10001
Option C:	12001
Option D:	11001
7.	UDP uses ----- to handle multiple processes from one host.
Option A:	Flow control
Option B:	Multiplexing
Option C:	De-multiplexing
Option D:	None of the above
8.	The ports ranging from 49,152 to 65,535 can be used as temporary or private port numbers. They are called the ----- ports
Option A:	Well – known
Option B:	Registered
Option C:	Dynamic
Option D:	Private
9.	Which of these is not applicable for IP protocol?
Option A:	Is connectionless.
Option B:	no error correction
Option C:	Offers unreliable service
Option D:	Offers reliable service
10.	If the value of HLEN in an IP packet is 0101, the header is _____ long.
Option A:	5
Option B:	20
Option C:	40

Option D:	60
11.	In the SSL record protocol operation pad_2 is –
Option A:	The byte 0x36 repeated 40 times for MD5
Option B:	The byte 0x5C repeated 48 times for MD5
Option C:	The byte 0x5C repeated 48 times for SHA-1
Option D:	The byte 0x36 repeated 48 times for MD5
12.	When an IP datagram carries an authentication header, the original value in the protocol field of the IP header is replaced by
Option A:	51
Option B:	52
Option C:	53
Option D:	54
13.	What is Not true about VPN in Network security methods?
Option A:	A tool that authenticates the communication between a device and a secure network
Option B:	VPN creates a secure, encrypted "tunnel" across the open internet.
Option C:	VPN typically based on IPsec or SSL
Option D:	VPN technology uses AH protocol of IPsec in the tunnel mode.
14.	Authentication Header (AH) protocol does not provide this security services
Option A:	Confidentiality
Option B:	Source authentication
Option C:	Integrity
Option D:	Access control
15.	H.323 uses G.71 or G.723.1 for
Option A:	Compression
Option B:	Communication
Option C:	Controlling
Option D:	Conferencing
16.	This is Not a Session Initiation Protocol (SIP) message
Option A:	Hello
Option B:	Invite
Option C:	ACK
Option D:	Bye
17.	Moving Picture Experts Group (MPEG) is used to compress
Option A:	Text
Option B:	Images
Option C:	Audio



Option D:	Video
18.	For which of the following applications Delay is not a criterion?
Option A:	Telephony
Option B:	Email
Option C:	Audio conferencing
Option D:	Remote Log in
19.	In QoS techniques, packets wait in a buffer(queue) until the node is ready to process them in
Option A:	Out- of –Order Ones
Option B:	First – In First - Out
Option C:	Last –In First- Out
Option D:	First-In Last-Out
20.	This technique is a part of improving the quality of service (QoS) for multimedia data
Option A:	Scheduling
Option B:	Multicasting
Option C:	Multiplexing
Option D:	Quantization

Subjective/Descriptive questions

Q2	Solve any Two Questions out of Three	10 marks each
A	With a neat diagram, explain the header format of email in detail.	
B	Explain the transition states of TCP with a neat diagram.	
C	<p>An ISP is granted a block addresses starting with 190.100.0.0/16 (65536 addresses).The ISP needs to distribute these addresses to three groups of customers as follows :</p> <p>a) The first group has 64 customers, each needs 256 addresses  b) The second group has 128 customers , each needs 128 addresses  c) The third group has 128 customers, each needs 64 addresses</p> <p>Design the sub-blocks and find out how many addresses are still available after these allocations.</p>	
Q3	Solve any Two Questions out of Three	10 marks each
A	Explain in detail Intrusion Detection System.	
B	Explain in detail RTP packet format.	
C	Discuss the different techniques that can be used to improve the quality of service (QoS)	

# Modified Paper

## University of Mumbai

### Examination 2020 under cluster 5(Lead College: A P Shah college)

Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: **Electronics and Telecommunications**

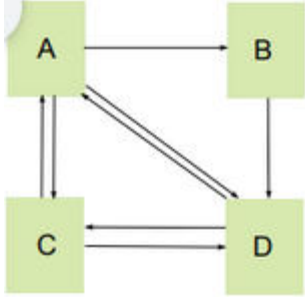
Curriculum Scheme: Rev 2016

Examination: BE Semester:VII

Course Code:ECCDL7032 and Course Name: Big Data Analytics

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 application of Nearest Neighbor Similarity search?
Option A:	Optical character Recognition
Option B:	Content based image retrieval
Option C:	Document Similarity
Option D:	Transaction processing system
2.	Pages with no inlinks or outlinks to or from the SCC are called as _____.
Option A:	In-component
Option B:	Tendrils
Option C:	Tubes
Option D:	Isolated components
3.	Which node will have the highest page rank value after the first iteration ? 
Option A:	B
Option B:	A
Option C:	D
Option D:	C
4.	Which NoSQL database is mostly used for storing product catalog data in ecommerce sites?
Option A:	Key-value
Option B:	Columnar
Option C:	Graph
Option D:	Document

## Modified Paper

5.	Arrange the following phases of a MapReduce program in the order that they execute? i. Partitioner ii. Mapper iii. Combiner iv. Shuffle/Sort
Option A:	i, iii , ii , iv
Option B:	i , ii , iii , v
Option C:	iii, ii, i, iv
Option D:	ii, iii , i , iv
6.	Cold Start Problems are associated with _____type of recommendation system.
Option A:	Collaborative filtering
Option B:	Content based
Option C:	Hybrid
Option D:	Item based filtering
7.	How many dead ends exist in the following Web graph?
	<pre> graph TD     a((a)) --&gt; b((b))     a((a)) --&gt; c((c))     b((b)) --&gt; d((d))     b((b)) --&gt; e((e))     c((c)) --&gt; d((d))     d((d)) --&gt; e((e))     d((d)) --&gt; f((f))     f((f)) --&gt; g((g))     g((g)) --&gt; c((c))     </pre>
Option A:	2
Option B:	1
Option C:	0
Option D:	3
8.	Which of the following is a core concept of Hadoop?
Option A:	Applications depend on the network infrastructure.
Option B:	All data are distributed in advance.
Option C:	If a node fails performance will dip.
Option D:	Nodes talk to each other as much as possible.
9.	What is the problem faced by the Page Rank algorithm?
Option A:	Dead Ends
Option B:	Orphan Pages
Option C:	Tendrils
Option D:	Tubes
10.	Which of the following is not the characteristic of stream data?
Option A:	Continuous
Option B:	Ordered
Option C:	Persistent
Option D:	Huge

## Modified Paper

11.	_____ decreases the amount of network traffic required during shuffle and sort phase.
Option A:	Mapper
Option B:	Reducer
Option C:	Combiner
Option D:	Partitioner
12.	If $d1 = 3 \ 2 \ 0 \ 5 \ 0 \ 0 \ 0 \ 2 \ 0 \ 0$ and $d2 = 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 2$ are two document vectors, Calculate the cosine similarity between these vectors?
Option A:	0.94
Option B:	0.856
Option C:	0.315
Option D:	0.415
13.	NoSQL databases are used mainly for handling large volumes of _____ data.
Option A:	Unstructured
Option B:	Structured
Option C:	Semi-structured
Option D:	Numerical data
14.	Which of the following is the component of Stream Data Management System?
Option A:	Stream Input Regulator
Option B:	Persistent database
Option C:	Transaction Manager
Option D:	Data dictionary
15.	Job Tracker runs on _____ while Task Tracker runs on _____ in Map Reduce execution pipeline.
Option A:	Data Node, Name Node
Option B:	Name Node, Data Node
Option C:	Data Node, Secondary Name Node
Option D:	Secondary Name Node, Data Node
16.	Which of the following is a column family data store ?
Option A:	DynamoDB
Option B:	Cassandra
Option C:	mongoDB
Option D:	Oracle
17.	In implementation of Natural join using MapReduce what will be the output of Map task if input tuple is (a, b) from relation R and (b,c) from relation S
Option A:	(b, ('R',a)), (b, ('S',c))
Option B:	(a, ('R',b)), (b,('S',c))
Option C:	(b,a),(b,c)
Option D:	(a,b), (b,c)
18.	For a 650 MB file how many InputSplit will be created?
Option A:	10
Option B:	11

## Modified Paper

Option C:	9
Option D:	13
19.	Consider users X and Y with rating vector $r_x$ and $r_y$ for movies $\{M_1, M_2, M_3, M_4, M_5\}$ which of the following similarity measures is suitable to find similarity between user X and Y?
Option A:	Hamming distance
Option B:	Cosine Similarity
Option C:	Edit distance
Option D:	Document Similarity
20.	Which of the following algorithms is best for frequent item set mining?
Option A:	PCY
Option B:	A-Priori
Option C:	DGIM
Option D:	FM

<b>Q2</b>	
A	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Explain the architecture of Data Stream Management System.
ii.	Explain any two NO-SQL data stores with example.
iii.	Explain with example techniques to find document similarity and its applications.
B	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	Explain various phases of Map-Reduce execution pipeline and role of combiner with suitable example.
ii.	Explain in detail any one Ranking algorithm used by Search Engines.

<b>Q3.</b>	
A	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Write the Map Reduce Pseudo code for any two of the following relational algebra operations i) Projection ii) Selection iii) Natural Join iv) Matrix-Vector Multiplication
ii.	Define CAP theorem. What are the business drivers for NoSQL?
iii.	Compare Content based Recommendation system with Collaborative filtering based Recommendation system
B	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	Explain with diagrams the Park Chen Yu (PCY) Algorithm.
ii.	Explain any one clustering algorithm for mining Social Network Graph.

## University of Mumbai

**Examination 2020 under cluster 5 (Lead College: A. P. Shah Institute of Technology)**  
Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021  
to 20<sup>th</sup> January 2021

Program: Electronics & Telecommunications

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ECCDLO7031 and Course Name: Neural Networks & Fuzzy Logic

Time: 2 hours

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 positive weight corresponds to _____ synapse.
Option A:	Additive
Option B:	Integral
Option C:	Excitatory
Option D:	Inhibitory
2.	A non-linear activation function is used to ensure that the neuron's response is
Option A:	Unbounded
Option B:	Bounded
Option C:	Reduced
Option D:	Amplified
3.	The learning rate ranges from _____ .
Option A:	1 to 10
Option B:	10 to 100
Option C:	100 to 1000
Option D:	0 to 1
4.	In an Unsupervised learning _____ .
Option A:	Specific output values are not given
Option B:	Specific output values are given
Option C:	No specific Inputs are given
Option D:	Both inputs and outputs are given
5.	The sigmoid function is _____ .
Option A:	S-shaped
Option B:	Z-shaped
Option C:	A step function
Option D:	U-shaped
6.	Which of the following is associated with artificial neural nets?
Option A:	Vagueness
Option B:	Learning
Option C:	Optimization
Option D:	Characterization

7.	A perceptron is a _____
Option A:	Back-propagation algorithm
Option B:	Back-tracking algorithm
Option C:	Feed-forward neural network
Option D:	Feed Forward-backward algorithm
8.	Which of the following neural networks uses supervised learning?
Option A:	Simple recurrent network
Option B:	Self-organizing feature map
Option C:	Hopfield network
Option D:	K means clustering
9.	A single-layer perceptron has 3 input units and 3 output units. How many weights does this network have?
Option A:	6
Option B:	9
Option C:	18
Option D:	27
10.	Perceptron is used as a classifier for
Option A:	Linearly separable data
Option B:	Non-linearly separable data
Option C:	Linearly non-separable data
Option D:	Any data
11.	Fuzzy logic is a form of
Option A:	Two-valued logic
Option B:	Crisp set logic
Option C:	Many-valued logic
Option D:	Binary set logic
12.	The values of the fuzzy set membership are represented by
Option A:	Discrete Set
Option B:	Degree of truth
Option C:	Probabilities
Option D:	Discrete set and probabilities
13.	In Fuzzy set the membership function generally in ranges
Option A:	0-100
Option B:	100-1000
Option C:	1-100
Option D:	0 - 1
14.	What are the two types of Fuzzy Inference Systems?
Option A:	Model-Type and System-Type
Option B:	Momfred-Type and Semigi-Type
Option C:	Mamdani-Type and Sugeno-Type
Option D:	Mihni-Type and Sujgani-Type



15.	If fuzzy membership sets $B_1 = \{0.1, 0.3, 0.8\}$ and $B_2 = \{0.2, 0.6, 0.3\}$ then the intersection of $B_1$ and $B_2$ will be equal to
Option A:	$\{0.1, 0.6, 0.8\}$
Option B:	$\{0.1, 0.3, 0.3\}$
Option C:	$\{0.1, 0.3, 0.8\}$
Option D:	$\{0.1, 0.6, 0.3\}$
16.	Fuzzy computing is a technique to deal with
Option A:	Vagueness
Option B:	Learning
Option C:	Optimization
Option D:	Precision
17.	The function to be applied over the net input in a neural network is called
Option A:	Approximate function
Option B:	Bilateral function
Option C:	Cardinal function
Option D:	Activation function
18.	In unsupervised learning, if the pattern class cannot be found then
Option A:	a new class is generated
Option B:	it results in a null set
Option C:	learning does not happen
Option D:	There will be errors
19.	An output of a fuzzy inference system is a
Option A:	a linguistic variable
Option B:	a crisp value
Option C:	a fuzzy set
Option D:	0 or 1
20.	A set of tall persons is a _____ set
Option A:	null
Option B:	specific
Option C:	fuzzy
Option D:	infinite

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>(5 marks each)</b>
A	Define Learning in a neural network. What are the different types of learning?	
B	Justify the statement: "Partial membership is allowed in fuzzy sets".	
C	A Hopfield network made up of four neurons is required to store the following pattern $X = [1 \ 1 \ -1 \ -1]$ . Evaluate the weight matrix of the Hopfield Network and the energy associated with this pattern.	
D	What is the need of activation function in a neural network?	
E	Explain at least 4 applications of neural networks.	
F	Develop graphical membership function to describe the linguistic variables "cold", "warm", "hot". The range of temperature is 0-100 degrees Celsius. Use trapezoidal and triangular membership functions.	

<b>Q3</b>	<b>Solve any Four out of Six</b> <span style="float: right;"><b>(5 marks each)</b></span>
A	“Initial weights are generally chosen to be small” – Why?
B	Define membership function and state its importance in fuzzy logic.
C	What is a fuzzy inference system?
D	What is an overfitting issue in neural networks?
E	State Kohonen’s learning rule. What are the merits and demerits of Kohonen’s self-organizing maps?
F	A neuron with 3 inputs has the weight vector as $w = [0.1 \ 0.3 \ -0.2]$ . The activation function is binary sigmoidal activation function. If the input vector is $[0.8 \ 0.6 \ 0.4]$ , find the output of the neuron.

**University of Mumbai**

**Examination 2020 under cluster \_\_ (Lead College: \_\_\_\_\_)**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: EXTC

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ECCDLO7034 and Course Name: CMOS Mixed Signal VLSI

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks (2 Marks each)
1.	In the current Mirror circuit the error in the output current occurs due to
Option A:	Punch through
Option B:	Channel length Modulation
Option C:	Body Effect
Option D:	Hot electron effect
2.	In the given circuit $I_{REF}=1$ Milliampere, $(W/L)_2=2(W/L)_1$ and $(W/L)_4=2(W/L)_3$ , Then $I_{OUT}$ Value is.
Option A:	1Milliampere
Option B:	2Milliampere
Option C:	3Milliampere
Option D:	4Milliampere
3.	In the given CS Amplifier $(W/L)_1=10(W/L)_2$ , Then overall voltage gain is
Option A:	2
Option B:	3
Option C:	4
Option D:	5

4.	The given circuits are _____ Amplifiers.
Option A:	Common Source
Option B:	Common Gate
Option C:	Common Drain
Option D:	Cascode
5.	In two stage op-amp purpose of compensation circuit is to
Option A:	High voltage gain
Option B:	To lower output resistance
Option C:	To achieve stable close loop response
Option D:	To increase output voltage swing.
6.	The main purpose of differential amplifier is
Option A:	To amplify both actual and noise signal
Option B:	To amplify actual signal and reject noise signal
Option C:	To provide large gain only to noise signal
Option D:	To provide large o/p power.
7.	The Second stage in the design of two stage op-amp is
Option A:	Differential amplifier
Option B:	Inverter
Option C:	Buffer
Option D:	High gain stage.
8.	In case of differential mode signal the two signals are having
Option A:	Equal amplitude and same phase
Option B:	Non equal amplitude and same phase
Option C:	Equal amplitude but out of phase
Option D:	Zero
9.	In order to achieve sustained oscillation the poles of amplifier should lie on
Option A:	LHS of S plane
Option B:	RHS of S plane
Option C:	On imaginary axis
Option D:	At the origin
10.	Switched capacitor circuit applied in FPAA to emulate
Option A:	RESISTORS
Option B:	INDUCTORS
Option C:	MEMORY
Option D:	BUSES
11.	PSSR can be defined as the product of the ratio of change in supply voltage to

	change in output voltage of op-amp caused by the change in power supply & _____ of op-amp.
Option A:	Open-loop gain
Option B:	Closed-loop gain
Option C:	Close-loop with unity feedback
Option D:	Close-loop with positive feedback.
12.	Among the given ADC _____ is fastest one
Option A:	Flash type
Option B:	Integrating Type
Option C:	Pipeline type
Option D:	Charge Scaling type.
13.	For a three bit ADC $V_{REF}=5V, N=3$ then value of 1LSB Voltage is
Option A:	0.625
Option B:	0.5
Option C:	1.625
Option D:	1.5
14.	For a Non Inverting Switch Capacitor Amplifier if $C_1$ is input capacitor and $C_2$ is feedback capacitor then its voltage gain is given as
Option A:	$C_1 + C_2$
Option B:	$C_1 - C_2$
Option C:	$C_1 / C_2$
Option D:	$C_1 * C_2$
15.	In Digital PLL normally as a phase detector we use
Option A:	AND Gate
Option B:	OR Gate
Option C:	NAND Gate
Option D:	EXOR Gate
16.	In common gate amplifier
Option A:	Input resistance is high and output resistance is high
Option B:	Input resistance is high and output resistance is low
Option C:	Input resistance is low and output resistance is high
Option D:	Input resistance is low and output resistance is low
17.	For a 3 bit DAC if $V_{REF}=5V$ , the value of $V_{STAIRCASE}$ Voltage for binary number 100 is
Option A:	1V
Option B:	1.5V
Option C:	2V
Option D:	2.5V
18.	In ADC the amount of time required to disconnect the capacitor from analog input source is known as
Option A:	Settling time
Option B:	Rise time

Option C:	Aperture time
Option D:	Periodic time
19.	CPLL stands for
Option A:	Complementary PLL
Option B:	Cascode PLL
Option C:	Clock PLL
Option D:	Charge Pump PLL.
20.	In MOSFET if Drain and Gate are Shorted then MOSFET Works in
Option A:	Linear Region
Option B:	Deep triode region
Option C:	Saturation Region
Option D:	Breakdown Region

<b>Q2</b> (20 Marks)	<b>Solve any ONE Questions out of GIVEN.</b>
	<b>20 marks.</b>
	Design the two stage op-amp to meet the following specification with phase margin of $60^\circ$ . Assume the channel length of transistor to be $1\mu\text{m}$ . The various specifications are. $A_V=4500 \text{ V/V}, V_{DD}=2.5\text{V}, V_{SS}= -2.5\text{V}, \text{GB}= 5\text{MHz}, C_L=10\text{pf},$ $\text{SR}=10\text{V}/\mu\text{sec}, V_{\text{out}}(\text{range})=\pm 2\text{V}, \text{ICMR}=-1\text{V to } 2\text{V}$ $, P_{\text{diss}}=2\text{mw}, K_P=50\mu\text{A}/\text{V}^2, K_N=100\mu\text{A}/\text{V}^2,$ $V_{TP}= -0.85\text{V}, V_{TN(\text{MIN})}=0.55\text{V}, V_{TN(\text{MAX})}=0.75\text{V}, \lambda_P=0.05 \lambda_N=0.04.$
	<b>OR</b>
	<b>10 marks</b>
	Draw and explain the working of Band gap reference voltage source for integrated circuit biasing.
	<b>10 marks.</b>
	Explain the working of the Ring Oscillator circuit using MOSFET, derive its transfer function and draw its pole-zero diagram.

<b>Q3.</b> (20 Marks)	<b>Solve any Two Questions out of Three 10 marks each</b>
A	Draw and explain the working of Switch capacitor Non Inverting amplifier circuit.
B	Draw and explain the working of Charge Scaling DAC.
C	Draw and explain the working of two step flash ADC.

**University of Mumbai**

**Examination 2020 under cluster 5 (Lead College: APSIT)**

**Examinations Commencing from 23<sup>rd</sup> December 2020 to 6<sup>th</sup> January 2021 and from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**

Program: **BE Electronics and Telecommunication Engineering**

Curriculum Scheme: Rev-2016

Examination: BE Semester VII

Course Code: ECCDLO7035 and Course Name: Embedded System

Time: 2 hour

Max. Marks: 80

Q1.	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Mean Time Between Failure (MTBF) of an embedded product is 48 weeks and Mean Time To Repair (MTTR) of the product is 2 weeks. What is the availability of the product?
Option A:	4 %
Option B:	96 %
Option C:	95 %
Option D:	90 %
2.	‘Planning activity’ and ‘Analysis & study activity’ are two main activities of ----- phase of Embedded Product Development Life Cycle (EDLC).
Option A:	Development and Testing
Option B:	Analysis
Option C:	Conceptualization
Option D:	Design
3.	Digital multimeter is an example of an embedded system for -----.
Option A:	Data communication
Option B:	Data monitoring
Option C:	Data storing
Option D:	Data processing
4.	----- helps in all phases of system design through a set of unique diagram for requirement capturing, designing and deployment.
Option A:	Assembly language
Option B:	Java language
Option C:	C and C++ language
Option D:	Unified Modeling Language (UML)
5.	In multitasking, the condition in which a high priority process has to wait for low priority task to release a resource, is known as
Option A:	Circular wait
Option B:	Deadlock
Option C:	Priority inversion
Option D:	Racing
6.	For a good scheduling algorithm, the response time for a process should be

Option A:	Maximum
Option B:	Average
Option C:	Least
Option D:	Varying
7.	What of the following is not true about CAN protocol?
Option A:	It is a serial synchronous communication protocol
Option B:	Nodes do not have specific address
Option C:	Theoretically, any number of nodes can be connected over CAN protocol
Option D:	It uses two lines for communication
8.	What of the following is not true about MODBUS protocol?
Option A:	It is a master-slave protocol
Option B:	It is a royalty-free protocol
Option C:	It uses serial communication
Option D:	It is a data link layer protocol
9.	What is a standard size of slave address in I2C protocol?
Option A:	8 bits
Option B:	4 bits
Option C:	10 bits
Option D:	7 bits
10.	Which of the following serial protocols supports error detection with CRC directly?
Option A:	I2C
Option B:	SPI
Option C:	UART
Option D:	CAN
11.	The term 'model' in EDLC represents
Option A:	The various phases in the life cycle of the product
Option B:	The various methods of analysis of the product
Option C:	The various designs of the product
Option D:	The various architecture of the product
12.	Which of the following is not true about the processors?
Option A:	Processors can be programmable or non-programmable
Option B:	Embedded Systems using General Purpose Processors have larger Time-To-Market than the systems using Custom Single Purpose Processor
Option C:	Single Purpose Processors do not have program memory
Option D:	General Purpose Processors are the best in terms of functional flexibility
13.	What is the function of Prescaler with respect to timer?
Option A:	frequency divider
Option B:	frequency multiplier
Option C:	frequency stabilizer
Option D:	frequency adder
14.	The instruction set of RISC processor is



Option A:	Simple and lesser in number
Option B:	Complex and lesser in number
Option C:	Simple and larger in number
Option D:	Complex and larger in number
15.	Which of the following modules does not use a timer in microcontrollers?
Option A:	Counter
Option B:	PWM
Option C:	Watchdog
Option D:	Interrupts
16.	A process switched its state from 'Running' to 'Ready' due to scheduling act. What is the type of multitasking supported by the OS?
Option A:	Co-operative
Option B:	Pre-emptive
Option C:	Non preemptive
Option D:	Non-cooperative
17.	Which of the following is not a responsibility of a device driver?
Option A:	Device initialization
Option B:	Task management
Option C:	Interfacing with user application
Option D:	Interrupt handling
18.	Under Windows Operating system, the input and output buffer memory for a named pipe is allocated in
Option A:	Non-paged system memory
Option B:	Paged system memory
Option C:	Virtual memory
Option D:	Data Memory
19.	In the Automatic chocolate vending machine the reprogramming of codes or relocation of code is not needed when ____ .
Option A:	The price of chocolate changes
Option B:	Advertisement is changed
Option C:	Machine is relocated
Option D:	Machine feature changes
20.	Which type of processor technology is used in the design of digital cameras?
Option A:	Micro-controller
Option B:	Microcontroller and Application specific processor
Option C:	Microprocessor
Option D:	There is no need of microcontroller or microprocessor

<b>Q2</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Explain DFG modelling technique with its components. Explain one	

	example with proper DFG flow
B	Explain design of GCD as a custom single purpose processor with the help of controller, data path and program.
C	Explain SPI protocol with the help of proper diagrams and its frame format

<b>Q3</b>	<b>Solve any Two Questions out of Three</b> <span style="float: right;"><b>10 marks each</b></span>
A	Explain Deadlock, Livelock and Starvation using Dining Philosophers example.
B	Three processes with process IDs P1, P2, P3 with estimated completion time 12, 10, 6 milliseconds respectively enter the ready queue together. Process P4 with estimated execution completion time 2 milliseconds enters the Ready queue after 3 milliseconds. Calculate the waiting time and Turn Around Time (TAT) for each process and the Average waiting time and Turnaround Time (Assuming there is no I/O waiting for the processes) in the SRT scheduling.
C	Explain in detail Adaptive cruise control in Car with the help of its components.

**University of Mumbai**

**Examination 2020 under cluster ALL (Lead College: VCET)**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: ALL\_Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7016 and Course Name: Cyber Security and Laws

Time: 2 hour

Max. Marks: 80

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<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Which of the following are wireless attacks?
Option A:	MAC Spoofing , Phishing
Option B:	Eavesdropping,, MAC Spoofing
Option C:	Phishing, Repudiation
Option D:	Eavesdropping , Non- Repudiation
2.	This attack can be deployed by infusing a malicious code in a website's comment section.
Option A:	Cross Site Request Forgery (XSRF)
Option B:	SQL injection
Option C:	HTML Scripting
Option D:	Cross Site Scripting (XSS)
3.	The Objective of Firewalls is to protect?
Option A:	Data Driven Attacks
Option B:	Unauthorized Access
Option C:	Confidentiality
Option D:	Integrity
4.	The user activities are sniff and forward this information as a background process to the attackers
Option A:	Adware
Option B:	Malware
Option C:	Spyware
Option D:	Warms
5.	It is a class of computer threat?
Option A:	Stalking
Option B:	Phishing

Option C:	DOS attacks
Option D:	Soliciting
6.	Someone posing as IT tech requests information about your computer configuration. What kind of attack is this?
Option A:	Whaling
Option B:	Social Engineering
Option C:	Insider Threat
Option D:	Phishing
7.	The Primary objective of worm is to Spread the infection from....
Option A:	computer to computer
Option B:	File to file on a computer
Option C:	Website to website
Option D:	Router to routers
8.	It is usually targeted by nature where the emails are exclusively designed to target any exact user.
Option A:	Algo-based phishing
Option B:	Vishing
Option C:	Domain Phishing
Option D:	Spear phishing
9.	In this attack, someone is repeatedly harassed to individuals or organizations using any electronics means.
Option A:	Identity theft
Option B:	Phishing
Option C:	Cyber stalking
Option D:	Bullying
10.	It is a kind of attempts by individuals to get confidential or sensitive information from a individuals to falsifying their identity?
Option A:	Identity theft scam
Option B:	Phishing scams
Option C:	Spyware scams
Option D:	Trojan horse Scam

11.	It cannot be exploited by assigning or by licensing the rights to others.
Option A:	Designs
Option B:	Patents
Option C:	Copy rights
Option D:	Trademark
12.	Which of following would not gain copyright protection?
Option A:	A DVD
Option B:	An unrecorded speech
Option C:	Written lyrics of a song
Option D:	A hand knitted jumper
13.	Which one of the following statements is true?
Option A:	The definition of an invention is set out in the Patents Act 1977.
Option B:	Copyright must be registered in order to gain protection.
Option C:	A patent must be registered in order to gain protection.
Option D:	The owner of a patent cannot sell it but can prevent others using his invention.
14.	Which one of the following is outside the scope of IT Act 2000
Option A:	Electronic message
Option B:	Electronic Evidence
Option C:	Power of Attorney with digital signature
Option D:	Electronic gift
15.	Which Act casts responsibility on body corporate to protect sensitive personal information and provide punishment for offences by companies.
Option A:	IT Act 2000
Option B:	Indian Evidence Act 1872
Option C:	Indian penal code
Option D:	IT (Amendment )Act 2008
16.	What is the proposed punishment for Cyber Terrorism in IT Act?
Option A:	10 year imprisonment
Option B:	Life Imprisonment

Option C:	5 year imprisonment
Option D:	1 Lac rupees penalty
17.	Which of the following NERC Standard provide cyber-security framework for identification and protection of critical cyber assets to support the reliable operation of BES
Option A:	CIP-001
Option B:	CIP-002
Option C:	CIP-002 through CIP-009
Option D:	CIP-003
18.	Standard CIP-002 is used for
Option A:	Critical cyber asset identification
Option B:	Electronic Security Perimeter
Option C:	Physical Security of Critical cyber assets
Option D:	Sabotage reporting
19.	Which of the following are part of key provisions of Sarbanes-Oxley Act ?
Option A:	Physical Security of Critical cyber assets
Option B:	Bulk Electric System (BES)
Option C:	Critical assets
Option D:	Corporate Responsibility for financial reports
20.	ISO 27000 was originally published in ____ as the BS 7799 by the British Standards Institute (BSI)
Option A:	1995
Option B:	1998
Option C:	2000
Option D:	2012

<b>Q2</b> <b>(20 Marks )</b>	
A	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Explain Active and Passive Attacks with example
ii.	Explain how Appeal can be made under the IT Act 2000
iii.	Explain Key IT Requirement of GLBA/GLB
B	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	How Criminal Plan the Attack? Explain various steps

ii.	Explain E-Contracts. Discuss E-Contracts Act 1872.
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<b>Q3.</b> <b>(20 Marks)</b>	
<b>A</b>	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Explain Bluetooth Hacking with various tools
ii.	Explain Vishing, Phishing and Smishing in Cyber Security
iii.	Explain Key IT Requirement of FISMA
<b>B</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	Explain how Intellectual Property Laws protect the rights of the owner of the Intellectual Property
ii.	Explain Key features of Indian Information Technology Act 2000.

**University of Mumbai**  
**Examination 2020 under cluster ALL (Lead College:     )**  
**Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**  
**Program: ALL\_Institute Level Optional Course 1**  
**Curriculum Scheme: Rev2016**  
**Examination: BE Semester VII**  
**Course Code: ILO 7018 and Course Name: EAM**

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Energy that is available in market for definite price is known as
Option A:	Renewable energy
Option B:	Commercial energy
Option C:	Non-commercial energy
Option D:	Traditional energy
2.	As per the report "BP Statistical Review of World Energy-2014", for how many years the coal reserve in India available for energy production?
Option A:	500
Option B:	300
Option C:	100
Option D:	200
3.	Which source of energy dominates the energy production mix in India?
Option A:	Natural gas
Option B:	Coal
Option C:	Oil
Option D:	Nuclear
4.	Assisting and implementing ENCON recommendation measures and monitoring the performance are done in
Option A:	Pre Audit phase
Option B:	Audit phase
Option C:	Post Audit phase
Option D:	Pre and Audit phase
5.	The height of a column in a pump is called as
Option A:	Horizontal head
Option B:	Static head
Option C:	Multi head
Option D:	Vertical head
6.	What covers study of Variations occurring in energy costs, availability and reliability of supply of energy, energy mix, identify energy conservation technologies, retrofit for energy conservation equipment.
Option A:	Performance assessment



Option B:	Energy Audit
Option C:	Energy reliability
Option D:	Energy planning
7.	Which type of audit offers the most accurate estimate of energy savings and cost?
Option A:	Preliminary Audit
Option B:	Detailed Audit
Option C:	Overall Audit
Option D:	Secondary Audit
8.	Obtaining site drawings like building layout, steam, air distribution, electricity distribution are performed in which phase of audit?
Option A:	Post Audit phase
Option B:	Pre Audit phase
Option C:	Audit phase
Option D:	In between Pre and Post Audit phase
9.	Power factor can be improved by connecting which among these?
Option A:	Semiconductor device
Option B:	Resistors
Option C:	Inductor
Option D:	Static capacitors
10.	Fixed charge and Variable charge are dependent on what factor for HT consumer?
Option A:	Average load ,Energy consumption
Option B:	Energy consumption, Maximum Demand
Option C:	Maximum demand, Energy Consumption
Option D:	Maximum demand ,Peak load demand
11.	Energy savings potential of variable torque applications compared to constant torque application is:
Option A:	Higher
Option B:	Equal
Option C:	Lower
Option D:	Does not depend on Torque
12.	Electronic soft starters are used for motors to:
Option A:	improve the loading
Option B:	provide smooth start and stop
Option C:	achieve variable speed
Option D:	provide jerk during starting
13.	For large space lighting we prefer
Option A:	Time based control
Option B:	day light based controllers
Option C:	Localized Switching
Option D:	Photo sensors
14.	Formation of bubbles in an impeller is called
Option A:	Cavitation

Option B:	Defects
Option C:	Friction
Option D:	Heat burn
15.	If no instrument other than tachometer is available, what method you would suggest for measuring the motor load?
Option A:	Slip method
Option B:	Input power measurement method
Option C:	Line current measurement method
Option D:	Terminal voltage method
16.	In lighting performance assessment ILER stands for
Option A:	International Lighting Energy Regulation
Option B:	Indian Lighting Efficiency Regulation
Option C:	Installed Load Efficacy Ratio
Option D:	Interior Lighting Energy Ratio
17.	To have lighting performance assessment satisfactory to good, ILER value must be
Option A:	0.75 and above
Option B:	0.5 and less
Option C:	between 0.25 to 0.5
Option D:	below 0.25
18.	Which LEED rating system requires durability?
Option A:	LEED for Schools
Option B:	LEED for Commercial Interiors
Option C:	LEED for Homes
Option D:	LEED for Existing Buildings: Operation and Maintenance
19.	Photovoltaic cell converts solar energy into
Option A:	Heat energy
Option B:	Electric energy
Option C:	Mechanical energy
Option D:	Chemical energy
20.	Which insulation material is used for high temperatures
Option A:	Magnesia
Option B:	Polyurethane
Option C:	Expanded Polystyrene
Option D:	Calcium Silicate

<b>Q2</b>	
<b>A</b>	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Explain any FIVE special features of green building.
ii.	Explain advantages of power factor improvement.
iii.	A pump is filling water in to a rectangular overhead tank of 5 m x 4 m with a height of 8 m. The inlet pipe to the tank is located at height of 20 m above ground. Pump suction : 3 m below pump level Overhead tank overflow line : 7.5 m from the bottom of the tank Power drawn by motor : 5.5 kW Motor efficiency $\eta$ : 92% Time taken by the pump to fill the overhead tank up to overflow level : 180 minutes. Find the pump efficiency.
<b>B</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	What is the need of energy audit and explain types of energy audit.
ii.	Describe General fuel economy measures in furnaces

<b>Q3</b>	
<b>A</b>	<b>Solve any Two</b> <span style="float: right;"><b>5 marks each</b></span>
i.	Explain Benchmarking and its types.
ii.	A 7.5 kW, 415 V, 15 A, 970 RPM, 3 phase rated induction motor with full load efficiency of 86 % draws 7.5 A and 3.23 kW of input power. Find the percentage loading of the motor.
iii.	Explain what is thermal insulations and its benefits.
<b>B</b>	<b>Solve any One</b> <span style="float: right;"><b>10 marks each</b></span>
i.	Describe energy saving opportunities in water pumps.
ii.	Explain energy conservation opportunities in lighting controls.

**University of Mumbai**  
**Examination 2020 under cluster ALL(Lead College: VCET)**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: ALL\_Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7011 and Course Name: Product Life Cycle Management

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	_____ is not a phase under product life cycle management
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Rotation
2.	In _____ phase extensive advertisement is needed for product promotion
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Decline
3.	In _____ phase profit level reaches to its maximum peak
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Decline
4.	In _____ phase product sales reaches to minimum and profit is also lowest
Option A:	Introduction
Option B:	Growth
Option C:	Maturity
Option D:	Decline
5.	_____ is not a benefit of PLM
Option A:	Product life cycle analysis
Option B:	Profit maximization
Option C:	Decision making
Option D:	Large investment
6.	In _____ design model approach simultaneous and interlinked design activities are carried out
Option A:	Integrated
Option B:	Individual
Option C:	Isolated
Option D:	Dual

7.	_____ engineering is also called as simultaneous engineering.
Option A:	Concurrent
Option B:	Combine
Option C:	Linear
Option D:	Parallel
8.	_____ emphasizes the multidisciplinary approach in the product development process
Option A:	Concurrent engineering
Option B:	Dual engineering
Option C:	Rotational Engineering
Option D:	Realistic engineering
9.	_____ is not a step under new product development.
Option A:	Idea generation
Option B:	Concept development
Option C:	Idea screening
Option D:	Sensitivity analysis
10.	In ____ product is customized according to the customer wishes and product prepared as per specific requirement of customer.
Option A:	Product configuration
Option B:	Product rotation
Option C:	Product division
Option D:	Product linearization
11.	PDM stands for _____
Option A:	Product Data Management
Option B:	Product Development Management
Option C:	Product Dispatch Management
Option D:	Product Distinct Manament
12.	_____ is not the benefit of PDM
Option A:	It centralizes and control data
Option B:	It removes unnecessary data
Option C:	It improves data management
Option D:	It increases cost and time
13.	_____ is not the feature of PDM
Option A:	It facilitates better use of resources
Option B:	Engineering changes can be controlled easily
Option C:	Lead time gets reduced
Option D:	Consumes more time and resources
14.	_____ is not the component of virtual product development
Option A:	Virtual product design
Option B:	Virtual simulation
Option C:	Digital manufacturing
Option D:	Supply chain management

15.	DMU stands for _____
Option A:	Digital Mock up Unit
Option B:	Digital Manufacturing Unit
Option C:	Digital Maintenance Unit
Option D:	Differential Manufacturing Unit
16.	_____ is a realistic rendering technique of creating an image by tracing the path of light
Option A:	Ray tracing
Option B:	Ray casting
Option C:	Radiosity
Option D:	Radiography
17.	DFE stands for _____
Option A:	Design for excellence
Option B:	Design for efficiency
Option C:	Design for environment
Option D:	Design for economy
18.	DFE focuses on _____ factor
Option A:	Economy
Option B:	Energy
Option C:	Efficiency
Option D:	Environment
19.	LCA stands for _____
Option A:	Life Cycle Assessment
Option B:	Life Cycle Analysis
Option C:	Life Cycle Assembly
Option D:	Life Cycle Achievement
20.	LCCA stands for
Option A:	Life Cycle Class Achievement
Option B:	Life Cycle Creative Assessment
Option C:	Life Cycle Combine Assessment
Option D:	Life Cycle Cost Analysis

<b>Q2</b> <b>(20 Marks)</b>	<b>Solve any Four out of Six 5 marks each</b>
A	<i>Explain product data management in detail.</i>
B	<i>Explain virtual product development tools in detail.</i>
C	<i>Explain the concept of sustainable development.</i>
D	<i>Explain virtual manufacturing in detail.</i>
E	<i>Explain product data management along with its advantages.</i>
F	<i>Explain the framework of life cycle assessment.</i>

<b>Q3.</b> <b>(20 Marks)</b>	<b>Solve any Two Questions out of Three 10 marks each</b>
A	<i>Explain life cycle phases in detail.</i>

<b>B</b>	<i>Explain product life cycle strategies in brief.</i>
<b>C</b>	<i>Explain various product development tools in detail.</i>

**University of Mumbai**  
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**Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021**  
Program: ALL\_Institute Level Optional Course 1  
Curriculum Scheme: Rev2016  
Examination: BE Semester VII  
Course Code: ILO 7019 and Course Name: Development Engineering

Time: 2 hour

Max. Marks: 80

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**0701\_R16\_ALL\_VII\_ILO7019\_QP1**

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following was the first committee on Panchayati raj in India
Option A:	Balwant Rai Mehta
Option B:	Ashok Mehta
Option C:	L.M.Singhvi
Option D:	S. Mohinder Singh
2.	When is National Panchayati Day celebrated
Option A:	23rd December
Option B:	1st June
Option C:	24th April
Option D:	15th September
3.	73rd amendment gave practical shape to which article of the constitution
Option A:	Article 14
Option B:	Article 32
Option C:	Article 40
Option D:	Article 51
4.	The multi-dimensional poverty index is a measure developed by the
Option A:	UNCTAD
Option B:	World Bank
Option C:	International Monetary Fund IMF
Option D:	Oxford poverty and human development initiative , OPHDI , and the UNDP
5.	Which of the following system is established on the basis of direct election
Option A:	Gram Panchayat
Option B:	Block Committee
Option C:	Zila Parishad
Option D:	District
6.	Engagement of local people in development project refers to
Option A:	Economic development
Option B:	Socila development
Option C:	Participatory development
Option D:	Sustainable development



7.	Panchayats are constituted for
Option A:	four years
Option B:	five years
Option C:	six years
Option D:	three years
8.	Bread labour means
Option A:	To earn one's livelihood by engaging in manual labour
Option B:	Hard physical labour
Option C:	Labour for making bread
Option D:	Engaging in agriculture
9.	The Human Development Index ranks the countries based on their performance in the key areas of (1) health, (2) sex-ratio, (3) education (4) access to resources
Option A:	1,2,3
Option B:	2,3,4
Option C:	1,3,4
Option D:	1,2,4
10.	Which one of the following is not a correct statement ?
Option A:	Growth is quantitative and value neutral
Option B:	Development means a qualitative change which is always value positive
Option C:	Positive growth and development refer to changes over a period of time
Option D:	Both growth and development refer to changes over a period of time.
11.	Which of the following elements must always be in the mind of the engineer while performing his duties vis-à-vis Ethics (1) public safety, (2) economy, (3) health, (4) welfare
Option A:	1,2,3
Option B:	1,2,3,4
Option C:	1,4
Option D:	1,3,4
12.	According to Gandhi, 'Enjoy the wealth by renouncing it' is the essence of
Option A:	Trusteeship
Option B:	Sarvodaya
Option C:	Swaraj
Option D:	Ramarajya
13.	The term that refers to principles, values, beliefs that define right or wrong behaviour is
Option A:	Customer satisfaction
Option B:	Innovation
Option C:	Ethics
Option D:	Empowerment
14.	In which five year plan the Panchayat Raj System was introduced in India for the first time
Option A:	First

Option B:	Second
Option C:	Fifth
Option D:	Sixth
15.	Which of the following is an appropriate general principle with regard to engineering ethics
Option A:	The engineer shall regard his duty to the public welfare as paramount to all other obligations
Option B:	The engineer shall regard his duty to the objectives of the company as paramount to all other obligations
Option C:	The engineer shall regard his duty to the Profession of engineering as paramount to all other obligations
Option D:	The engineer shall regard his duty to his excellence as paramount to all other obligations
16.	Those individuals who raise ethical concerns to others inside or outside the organisation are called
Option A:	Entrepreneur
Option B:	Whistle blower
Option C:	Social entrepreneur
Option D:	Social impact management
17.	Which of the following is not a key intervention to improve governance
Option A:	Facilitating independent and inclusive journalism
Option B:	Capacity building of government officials
Option C:	Advocacy for policy design and implementation
Option D:	Employment for all
18.	Which of the following is not in the 11 <sup>th</sup> schedule of subjects
Option A:	Fisheries industry
Option B:	Safe drinking water
Option C:	Markets and fairs
Option D:	Large irrigation projects
19.	The following is not a stated objective of Self Help Groups
Option A:	Provide employment to the members
Option B:	Create awareness about rights
Option C:	Foster a sense of community
Option D:	Entrepreneurship development
20.	Those individuals who raise ethical concerns to others inside or outside the organisation are called
Option A:	Entrepreneur
Option B:	Whistle blower
Option C:	Social entrepreneur
Option D:	Social impact management

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	Explain the provisions of the 74 <sup>th</sup> amendment	
B	What is the scope of information and communication technology in rural India	
C	Define ethics and ethical dilemma	
D	What are the important components of Green Revolution	
E	What are the various steps taken for inclusion of women and the members of the reserved category in decision making	
F	Why was there a need to set up rural co-operatives	

<b>Q3</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	Briefly discuss the various rural development schemes in India	
B	What is the importance of ethical conduct in business	
C	Human Development Index is a barometer of a nation's progress- Comment on this while giving specific examples to prove your point	
D	What are self help groups ( SHG)? Explain their significance in rural development	
E	Discuss any 2 initiatives of the Government of India towards urban development	
F	What are the functions of Panchayat Samiti	

**University of Mumbai**  
**Examination 2020 under cluster ALL (Lead College: VCET)**

Program: **ALL\_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7017

Course Name: Disaster Management and Mitigation Measures

Time: 2 hour

Max. Marks: 80

<b>Q1.</b>	<b>Choose the correct option for following questions. All the Questions are compulsory and carry equal marks</b>
1.	Which of the following is NOT occurred as a consequence of earthquake
Option A:	Tsunami
Option B:	Fire
Option C:	Damage to building
Option D:	Drought
2.	Which of the following is NOT the natural cause of flood .
Option A:	River bank erosion
Option B:	Poor natural drainage
Option C:	Heavy rain
Option D:	Deforestation
3.	Terrorism is a _____ type of disaster
Option A:	Man made
Option B:	Natural
Option C:	Both natural and man made
Option D:	Neither natural nor man made
4.	World Health Organization (WHO) was established in
Option A:	1950
Option B:	1948
Option C:	1947
Option D:	1960
5.	Who heads NDMA, the apex body for Disaster management
Option A:	Home Minister
Option B:	Finance Minister
Option C:	Prime Minister
Option D:	Home Secretary
6.	Which of the following is a disaster mitigation strategy?
Option A:	Constructing cyclone shelters

Option B:	Giving loans from banks
Option C:	Providing cheap electricity
Option D:	Providing school uniforms to children
7.	Which of the following organization is the apex authority of disaster management in India?
Option A:	NDA
Option B:	NDMA
Option C:	CDMA
Option D:	INDR
8.	If the deficiency of a particular year's rainfall more than 50 % of normal it is termed as
Option A:	Onset of Drought
Option B:	Moderate Drought
Option C:	Severe Drought
Option D:	Simple Drought
9.	Magnitude of earthquake indicates amount of _____.
Option A:	vibrations per second
Option B:	vibrations per minute
Option C:	Oscillations
Option D:	energy released
10.	By which Act, N.I.D.M got the statutory organization status?
Option A:	National Disaster Policy Act 1999
Option B:	NDMP 2019
Option C:	Disaster Management Act 2005.
Option D:	National DM Policy 2009
11.	Amateur Radio is also known as?
Option A:	Ham radio
Option B:	Home radio
Option C:	Pocket radio
Option D:	Silent radio
12.	What are the three phases of disaster management planning?
Option A:	Preparation, Response and Recovery
Option B:	Preparation, Planning and Perception
Option C:	Evacuating, Rebuilding and Re-branding
Option D:	Planning, Evacuating and Recovery
13.	Cyclones, Heat wave , Climate change are part of _____disaster.
Option A:	The Geological Disaster
Option B:	The Hydrological Disasters
Option C:	The Meteorological Disasters
Option D:	The Chemical Disaster

14.	The Indian Tsunami Early Warning Centre (ITEWC) established at Indian National Centre for Ocean Information Sciences is located in
Option A:	Chennai
Option B:	Kochi
Option C:	Goa
Option D:	Hyderabad
15.	In _____ in 2013 cloudburst created the flash flood situation to cause heavy damage to lives and property.
Option A:	Uttarakhand
Option B:	Chennai
Option C:	Kashmir
Option D:	Karnataka
16.	When was the updated & revised National Disaster Management Plan was prepared?
Option A:	2016
Option B:	2019
Option C:	2018
Option D:	2017
17.	Which of the following is the best thing to do during heavy lightning?
Option A:	lie on the ground in an open place
Option B:	Go into a water body
Option C:	Stay indoors, away from metallic doors and windows
Option D:	Stand under a tall tree
18.	The given three actions are arranged for which step i) The planning ii) The training and iii) The supply
Option A:	The prevention step
Option B:	Recovery step
Option C:	The preparation step
Option D:	The recovery step
19.	The Vision of _____ is “To build a safer and disaster resilient India by a holistic proactive technology driven and sustainable development strategy that involves all stake holders and fasters a culture of Prevention, preparedness and Mitigation.
Option A:	N.D.R.F
Option B:	N.D.M.A
Option C:	S.D.R.F
Option D:	N.I.D.M
20.	S.D.R.F Stands for
Option A:	State Disaster Response Fund
Option B:	State Disaster Relief Fund
Option C:	State Dedicated Relief Fund
Option D:	State Dynamic Response Fund

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	State and describe the measures to prevent the global warming.	
B	Define “Nuclear Disaster “and describe the effects of Nuclear disasters in India	
C	What are the long term and short-term effects of disaster?	
D	What are the main phases of Disaster Management?	
E	Describe the importance and the methods to create public awareness in Disaster management?	
F	Explain the role of Government Agencies in Relief fund raising for Disaster management.	

<b>Q3.</b>	<b>Solve any Two Questions out of Three</b>	<b>10 marks each</b>
A	Write detail note on occurrence, causes and measurement of earthquake. List out some of the major earthquakes occurred in India	
B	Explain the role of NGO’s in post disaster scenario and during rehabilitation.	
C	State Do’s and Don’ts in case of various disasters.	

**University of Mumbai**  
**Examination 2020 under cluster ALL(Lead College: VCET)**

Examinations Commencing from 7<sup>th</sup> January 2021 to 20<sup>th</sup> January 2021

Program: ALL\_Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7012 and Course Name: Reliability Engineering

Time: 2 hour

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The Bathtub curve indicates failure probability, Which stage is NOT normally associated with the bathtub curve? _____
Option A:	Pulling the plug where production is halted due to unacceptable level of failures
Option B:	Infant-mortality where failures occur early
Option C:	Wear-out where failure increases due to age
Option D:	Normal-life where few failures occur
2.	Three components each with a reliability of 0.9 are placed in series. What is the reliability of the system ?
Option A:	0.729
Option B:	0.125
Option C:	0.00258
Option D:	0.989
3.	. If A is a perfect subset of B and $P(a) < P(b)$ , then $P(B - A)$ is equal to _____
Option A:	$P(a) / P(b)$
Option B:	$P(a) P(b)$
Option C:	$P(a) + P(b)$
Option D:	$P(b) - P(a)$
4.	In order to maintain maintainability in the system, repair time must _____
Option A:	be increased
Option B:	be reduced
Option C:	kept constant
Option D:	keeps on changing
5.	What refers to wear out failure _____.
Option A:	Depends upon the subject
Option B:	Depends upon type of the experiment
Option C:	Increasing failure rate
Option D:	Decreasing failure rate
6.	Find median and mode of the messages received on 9 consecutive days 15,11,9, 5,18,4,15,13,17.
Option A:	13,6
Option B:	13,18



Option C:	18,15
Option D:	15, 16
7.	The reliability of a device comprised of various parts functioning in series is the :
Option A:	Product of the reliabilities
Option B:	Sum of the probabilities of the unreliabilities
Option C:	Product of the unreliabilities
Option D:	Sum of the reliabilities
8.	Which among the following exhibits inversely proportional relationship with the reliability?
Option A:	Production cost
Option B:	Maintenance and repair cost
Option C:	Design and development cost
Option D:	Availability
9.	If 'm' is the mean of a Poisson Distribution, then variance is given by _____
Option A:	$m^2$
Option B:	$m^{1/2}$
Option C:	m
Option D:	$\frac{m}{2}$
10.	Which of the following is not considered a reliability design method_____.
Option A:	Parts selection
Option B:	Choice of technology
Option C:	Accessibility
Option D:	Derating
11.	Markov analysis is a technique that deals with the probabilities of future occurrences by_____.
Option A:	Using Bayes' theorem
Option B:	Analyzing presently known probabilities
Option C:	Time series forecasting
Option D:	The maximal flow technique
12.	Skewness of Normal distribution is _____
Option A:	Negative
Option B:	Positive
Option C:	0
Option D:	Undefined
13.	The design function which assigns probability of failures between components or subsystems is called:
Option A:	Significance
Option B:	Prediction
Option C:	Qualification
Option D:	Apportionment
14.	What is MTTR

Option A:	Mean Time To Restore
Option B:	Mean Time To Repair
Option C:	Mean Time To Recovery
Option D:	Mean Time to Restoration
15.	The inherent availability can be calculated for repairable system as:
Option A:	$A_I = \frac{MTBF}{MTTF + MTTR}$
Option B:	$A_I = \frac{MTTF}{MTTF + MTTR}$
Option C:	$A_I = \frac{MTTF}{MTBF + MTTR}$
Option D:	$A_I = \frac{MTTR}{MTTF + MTTR}$
16.	Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?
Option A:	44/69
Option B:	25/69
Option C:	13/24
Option D:	11/24
17.	What would happen, if an equipment possesses reliability and maintainability to the maximum extent in accordance to MTTR?
Option A:	Failure rate is higher & downtime is longer
Option B:	Failure rate is lower & downtime is longer
Option C:	Failure rate is higher & downtime is shorter
Option D:	Failure rate is lower & downtime is shorter
18.	All fault-tolerant techniques rely on
Option A:	Integrity
Option B:	Dependability
Option C:	Redundancy
Option D:	Reliability
19.	What is the Major Key parameter of maintainability?
Option A:	Accessibility
Option B:	Vulnerability
Option C:	RCS
Option D:	Survival
20.	Which of the following is the biggest impact of availability
Option A:	mean time
Option B:	median time
Option C:	downtime
Option D:	maximum time of repair

<b>Q2</b>	<b>Solve any Four out of Six</b>	<b>5 marks each</b>
A	Tests performed on a self-diagnostic module for a complex electronic system resulted in correct diagnostics of a known fault 98% of time with only a 1% false reading when it was known there were no faults present. The Probability of a failure (fault) occurring over the test period is 0.005. How reliable is the self-diagnostic module?	
B	<p>Consider the system below. Do the following</p> <p>a) Assume that all components are identical and independent, and have a reliability <math>R(t)</math>. Find the expression for the system reliability.</p> <p>b) Assume the components have exponentially distributed failure times with parameter <math>\lambda</math>. Develop an expression for the failure rate of the system <math>\lambda_s(t)</math>.</p>	
	<pre> graph LR     In(( )) --- C1[1]     C1 --- J1(( ))     J1 --- C5[5]     J1 --- J2(( ))     J2 --- C2[2]     J2 --- C4[4]     C2 --- C3[3]     C4 --- C3     C3 --- Out(( ))           </pre>	
C	Explain measures of Availability.	
D	Obtain reliability of Parallel system containing of n components, when the reliability of each component is known. Assume that the units are non-repairable.	
E	Explain the Failure Mode Effects analysis	
F	Explain Reliability Block Diagram with example	

<b>Q3</b>	<b>Solve any Two out of Three</b>	<b>10 marks each</b>
A	Explain Bath Tub Curve, Hazard rate, failure density and Failure Rate with help of suitable example	
B	It is known that 5% of the book bound at a certain bindery have defective bindings. Find the probability that 2 of 100 books bound by this bindery will defective binding using the Poisson approximation to the binomial distribution.	
C	Explain Reliability Improvement methods with suitable example	