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 (JUNE 2021)

PROGRAMME - B.E. (Electronics)(REV-2016) (Choice Based)

SEMESTER - VII

Days and Dates	Time	Course Code	Paper
Tuesday, June 15, 2021	03:30 p.m. to 05:30 p.m.	ELX701	Instrumentation System Design
Thursday, June 17, 2021	03:30 p.m. to 05:30 p.m.	ELX702	Power Electronics
Saturday, June 19, 2021	03:30 p.m. to 05:30 p.m.	ELX703	Digital Signal Processing
Tuesday, June 22, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7031	Department Level Optional zcourses III: Neural Network & Fuzzy Logic
Tuesday, June 22, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7032	Advance Networking Technologies
Tuesday, June 22, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7033	Robotics
Tuesday, June 22, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7034	Integrated Circuit Technology
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7011	Institute Level Optional Course-I :- Product Life Cycle Management
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7012	Reliability Engineering
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7013	Management Information Systems
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7014	Design of Experiments
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7015	Operations Research
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7016	Cyber Security & Laws
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7017	Disaster Management & Mitigation Measures
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7018	Energy Audit & Management
Thursday, June 24, 2021	03:30 p.m. to 05:30 p.m.	ILO7019	Development Engineering

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

Mumbai
20th May, 2021

Principal

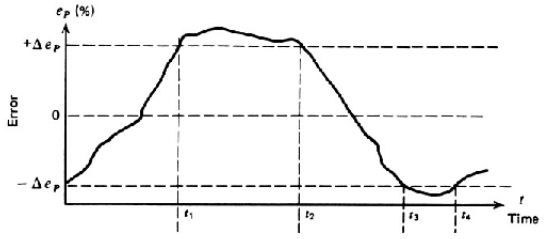
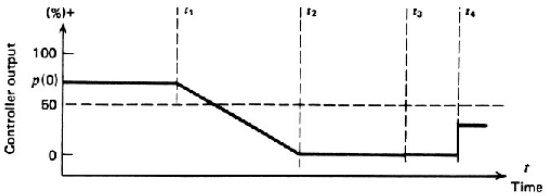
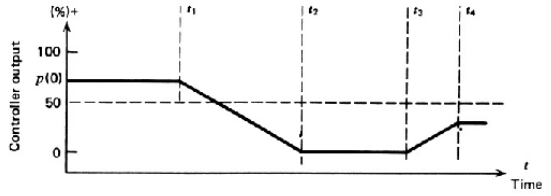
University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 15th June 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2016
Examination: BE Semester VII
Course Code: ELX 701 and Course Name: Instrumentation System Design

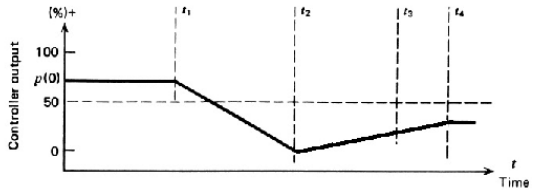
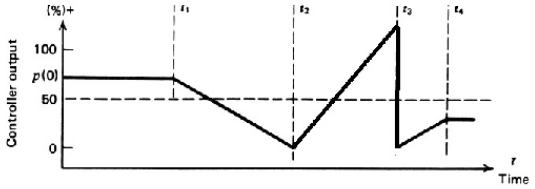
Time: 2 hour Max. Marks: 80

==========

Note:
1. Question 1 (40 Marks): All the Questions are compulsory and carry 2 marks each.
2. Question 2 (20 Marks): Solve any Two Questions out of Three 10 marks each.
3. Question 3 (20 Marks): Solve any Two Questions out of Three 10 marks each.

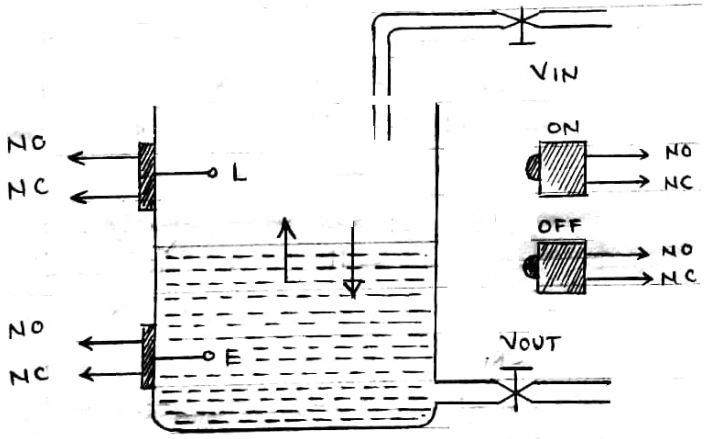
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which of the following example of Electrical actuator
Option A:	Solenoid
Option B:	Pneumatic flapper nozzle
Option C:	Vane Compressor
Option D:	Hydraulic double acting cylinder
2.	FRL unit in Pneumatic system is
Option A:	Friction - Regulator – Lubricator
Option B:	Friction - Regulator – Liquid
Option C:	Filter - Regulator – Lubricator
Option D:	Filter - Regulator – Liquid
3.	Which statement true for Control valve sizing
Option A:	The relationship between volume increase and flow rate through a valve is conveniently expressed by a flow coefficient (Cv).
Option B:	The inverse relationship between pressure drop and temperature through a valve is conveniently expressed by a flow coefficient (Cv).
Option C:	The relationship between pressure drop and flow rate through a valve is conveniently expressed by a flow coefficient (Cv).
Option D:	The relationship between pressure drop and temperature through a valve is conveniently expressed by a flow coefficient (Cv).
4.	This flow control valve is not suitable for tight shut-off
Option A:	Ball Valve
Option B:	Butterfly Valve
Option C:	Gate Valve
Option D:	Globe Valve
5.	Which of the following signal conditioning techniques can be used to minimize signal reflection?

Option A:	Impedance matching
Option B:	Filtering
Option C:	Linearization
Option D:	Bias change
6.	In an instrumentation amplifier using transducer bridge, which device measure the change in physical energy
Option A:	Resistive transducer
Option B:	Indicating meter
Option C:	Capacitive transducer
Option D:	Inductor circuit
7.	Which statement is false for 4mA to 20 mA transmission
Option A:	Current value degrades over long distances.
Option B:	It would be extremely difficult to identify that either 0mA current is due to open circuit of the transmitter.
Option C:	4 mA is equal to 0% output and 20mA ie equal to 100% output.
Option D:	4-20mA current output is fed to the input card of any controller, we use 250 Ohm resistor in path to convert this current signal into voltage signal of range 1-5V
8.	Which composite controller is not applicable
Option A:	P+I control
Option B:	P+D control
Option C:	I+D control
Option D:	P+I+D control
9.	 What could be the response of floating single speed controller mode for given error curve (e_p) with respective time shown in above figure.
Option A:	
Option B:	

Option C:	
Option D:	
10.	In PID control, response of PID controller to error with ramp nature
Option A:	Constant line
Option B:	Ramp response
Option C:	Parabolic response
Option D:	Step response
11.	In PLC ladder diagram, vertical lines are known as
Option A:	Rungs
Option B:	Power rails
Option C:	Outputs
Option D:	Scan lines
12.	When ____ contacts are actuated, they can disrupt the power supply through them.
Option A:	normally open type
Option B:	normally closed type
Option C:	normally open type and normally closed type
Option D:	Power
13.	Which of the following is used an input device on a ladder diagram?
Option A:	proximity sensor
Option B:	Motor coil
Option C:	Control Relay
Option D:	Solenoid
14.	PLC Architecture does not have this block
Option A:	Input module
Option B:	Processor
Option C:	Remote Terminal Unit
Option D:	Power supply
15.	In Process control, DCS stands for
Option A:	District controller scheme
Option B:	Distribution of control signal
Option C:	Design of Control System
Option D:	Distributed Control System

16.	What is the maximum device handling capacity of serial standard protocol RS485 in terms of drivers and receivers on a single line?
Option A:	8
Option B:	10
Option C:	16
Option D:	32
17.	What could be the voltage range for input current changes from 4mA to 20mA if the load resistance is 250Ω
Option A:	0V to 5V
Option B:	1V to 5V
Option C:	10V to 50V
Option D:	3V to 15V
18.	NEMA enclosure type standard for Outdoor use to provide a degree of protection against falling dirt; against hose-directed water and the entry of water during occasional temporary submersion at a limited depth; and that will be undamaged by the external formation of ice on the enclosure.
Option A:	Type 3
Option B:	Type 6
Option C:	Type 5
Option D:	Type 3R
19.	Important layers in Safety Instrumented system
Option A:	Prevention and mitigation layers
Option B:	Protection and measurement layers
Option C:	Prevention and movement layers
Option D:	Protect and mitigate layers
20.	SAMA is an acronym standing for _____, referring to a unique form of diagram used primary in the power generation industry to document control strategies.
Option A:	Significant And Market Association
Option B:	Science Application and Methodology Analysis
Option C:	Scientific Apparatus Makers Association
Option D:	Scientific Analysis Methods Assistant

Q2.	**Solve any Two Questions out of Three 10 marks each.**
A	Explain the flashing and cavitation in process control valve with how these two can be avoided.
B	With importance of 4mA – 20mA current transmission, explain 2- wire, 3-wire and 4-wire transmitter with neat diagrams.
C	Discuss disadvantages of each controller modes P-mode, D-mode and I-mode as well as how PID controller works as a composite controller.

Q3.	Solve any Two Questions out of Three 10 marks each
A	 Develop a PLC ladder diagram for a process shown in above figure. When the system is turned on, the tank in the figure alternately fills to level L and then will empty to level E. The switches activated on rising level. Both NO and NC type of connections are available for the level switches and On/Off push buttons.
B	Discuss need of Data Acquisition System and explain SCADA with its components, advantages, disadvantages and applications
C	What are general requirements of Calibration standards? Discuss ISO/IEC 17025 Accredited Calibration.

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX 701 and Course Name: Instrumentation System Design

Time: 2 hour Max. Marks: 80

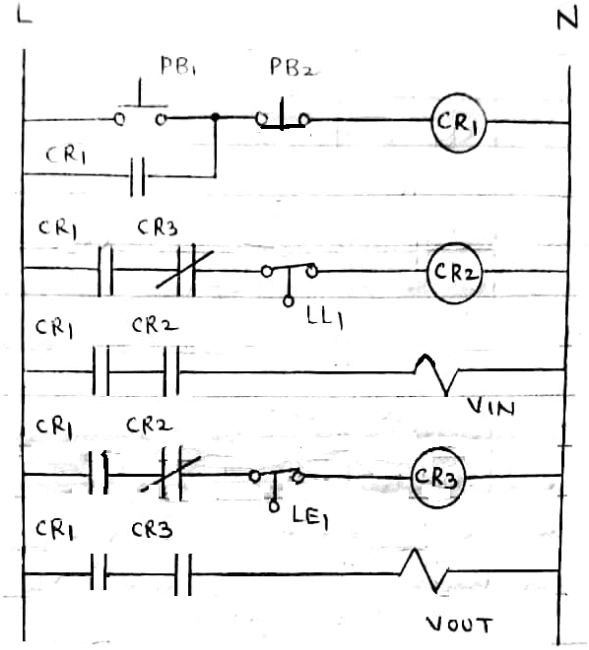
==========

Q1:

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

Important steps and final answer for the questions involving numerical example

Q3. (A):



University of Mumbai

Examination 2021 under Cluster 06

(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: Electronics Engineering

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX 702 and Course Name: Power Electronics

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 voltage at which SCR starts conducting current from anode to cathode without applying gate signal is called as
Option A:	Forward breakover voltage (VBO)
Option B:	Reverse breakdown voltage (VBR)
Option C:	Peak Inverse Voltage (PIV)
Option D:	Gate triggering voltage
2.	What is the maximum value of firing angle for R – triggering method of SCR
Option A:	45^0
Option B:	60^0
Option C:	90^0
Option D:	180^0
3.	Which of the following is not the gate drive requirement for the SCR
Option A:	Gate pulse width is equal to, or greater than SCR turn-on time
Option B:	Train of pulses is used to turn on SCR
Option C:	Peak instantaneous gate power dissipation is to be kept within the value specified by the manufacturers
Option D:	Gate pulse width can be less than SCR turn-on time
4.	Which of the following commutation circuit uses auxiliary SCR to turn off main thyristor
Option A:	Class A
Option B:	Class B
Option C:	Class C
Option D:	Class D
5.	The phenomenon in IGBT due to which turning off of IGBT not possible by application of gate signal is called as
Option A:	Latch up
Option B:	Negative Resistance
Option C:	Charge Controlling
Option D:	Gate triggering

6.	Based on the switching frequency of device which of the following is correct
Option A:	BJT < IGBT < MOSFET
Option B:	BJT < MOSFET < IGBT
Option C:	MOSFET < BJT < IGBT
Option D:	IGBT < MOSFET < BJT
7.	Which of the following is not the advantage of freewheeling diode
Option A:	Input power factor is improved
Option B:	Load current waveform is improve
Option C:	Overall converter efficiency is improved
Option D:	Thyristor conduction time increases
8.	For the symmetrical semi-converter configuration which of the following is true
Option A:	The conduction time of thyristor is equal to the conduction time of diode.
Option B:	The conduction time of thyristor is less than the conduction time of diode.
Option C:	The conduction time of thyristor is more than the conduction time of diode
Option D:	The conduction time of diode is zero.
9.	Which of the following is incorrect statement for SCR
Option A:	SCR has four layers in its internal structure
Option B:	SCR is uncontrolled device .
Option C:	SCR is three terminal device
Option D:	SCR has three P-N junctions
10.	What is the pulse width of the single-phase Modulation of PWM inverters to eliminate third harmonic
Option A:	30^0
Option B:	60^0
Option C:	120^0
Option D:	180^0
11.	The amplitude of the output voltage for the voltage source inverters (VSI), is ___
Option A:	dependent on the load
Option B:	Independent of the load
Option C:	Dependent only on L loads
Option D:	Depends on output frequency.
12.	The non-punch through IGBT has
Option A:	Asymmetrical blocking capacity
Option B:	No blocking capacity
Option C:	Symmetrical blocking capacity
Option D:	Does not exist.
13.	A cyclo-converter converts .
Option A:	Measures frequency of AC mains
Option B:	AC of one frequency to AC of another frequency
Option C:	AC to Dc
Option D:	DC to AC

14.	Number of SCR use in a Single-Phase Bridge type cyclo-converter are
Option A:	4
Option B:	8
Option C:	6
Option D:	None of the mentioned
15.	The capacitor connected across the SCR will _____
Option A:	Provide dv/dt protection for the SCR
Option B:	Avoid accidental triggering of the SCR due to noise
Option C:	Provide di/dt protection for the SCR
Option D:	Provide high current protection for the SCR
16.	The load voltage of a DC DC converter can be controlled by varying the
Option A:	duty cycle
Option B:	firing angle
Option C:	reactor position
Option D:	extinction angle
17.	In a Series Inverter, the commutating elements are such that they form _____.
Option A:	Underdamped Circuit
Option B:	Overdamped Circuit
Option C:	Critically damped Circuit
Option D:	Critically damped or Overdamped Circuit
18.	A Half Bridge Inverter typically requires _____
Option A:	2 wire supply
Option B:	3 wire supply
Option C:	No supply restrictions
Option D:	1 wire supply
19.	In VSI (voltage source inverters)
Option A:	both voltage and current depend on the load impedance
Option B:	only voltage depends on the load impedance
Option C:	only current depends on the load impedance
Option D:	none of the mentioned
20.	_____ is defined as the ratio of the total mean input power to the total RMS input Volt Amperes
Option A:	Input Current Distortion Factor [CDF]
Option B:	Input Power Factor [PF]
Option C:	Input Harmonic Factor [HF]
Option D:	Input Displacement Factor [DF]

Q2	**Solve any Four** out of Six (5 marks each)
A	What is the need of freewheeling diode in rectifiers? Explain with suitable diagrams.
B	State any 4 protections of SCR, Explain the function of snubber for protection of SCR.
C	Explain in brief single phase cyclo-converter with the circuit diagram and waveform.
D	Explain single pulse modulation in Inverter. Explain the neutralization of Harmonics.
E	Explain half controlled rectifier using SCR. Draw waveform and derive relation of output voltage for highly inductive load.
F	Explain the principle of ON /OFF control of dc-dc converters with circuit diagram and waveform

Q3.	**Solve any Two Questions** out of Three (10 marks each)
A	What are the turning off methods of SCR. Explain the class C commutation method with the help of neat circuit diagram and waveform
B	Describe different modes of SCR with the help of static VI characteristics and define latching current and holding current.
C	Draw and Explain Buck-Boost Converter with the help of circuit diagram and waveforms. Derive the relation for load voltage.

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examination Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: R2016

Examination: BE Semester: VII

Course Code: ELX 702 and Course Name: Power Electronics

Time: 2 hour Max. Marks: 80

==========

Q1:

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

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX703 and Course Name: Digital Signal Processing

Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	DFT of a sequence {1,2,2,1}is…….
Option A:	{ 6, (-1-j), 0, (-1+j) }
Option B:	{ -6, (-1-j), 0, (-1+j) }
Option C:	{ -6, (1-j), 0, (-1+j) }
Option D:	{ -6, (-1+j), 0, (-1-j) }
2.	FIR filter with Symmetric impulse response and even length has……
Option A:	Compulsory zero at Z= -1
Option B:	Compulsory zero at Z= - ∞
Option C:	Compulsory pole at Z= -1
Option D:	Compulsory zero at Z= 0
3.	Which of the following is not the method of transformation for IIR filter?
Option A:	Impulse Invariance transformation
Option B:	Bilinear Transformation
Option C:	Matched Z transformation
Option D:	Linear transformation
4.	The impulse invariant transformation of the analog filter with transfer function H(S)=1/(s+1) is……. .Assume sampling time as T=1 second.
Option A:	H(Z)=(Z+1)/(3Z-1)
Option B:	H(Z)=(Z-1)/(3Z-1)
Option C:	H(S)=(S+2)/(3S-1)
Option D:	H(S)=(S+1)/(3S-1)
5.	Frequency warping effect in IIR filter is
Option A:	Linear graph between analog and digital frequency.
Option B:	Nonlinear graph between analog and digital frequency.
Option C:	Linear graph between analog and digital signal amplitude.
Option D:	Nonlinear graph between analog and digital signal amplitude.
6.	Which one is incorrect among the following?
Option A:	In Impulse Invariant Transformation aliasing is present
Option B:	In Impulse Invariant Transformation aliasing is not present
Option C:	In BLT frequency warping effect is present.

Option D:	In Impulse Invariant Transformation only poles of the system can be mapped
7.	Duality property of DFT is
Option A:	If DFT{x(n)}=X(K) then DFT{X(n)}=Nx((-K))$_N$
Option B:	If DFT{x(n)}=X(K) then DFT{X(n)}=Nx((K))$_N$
Option C:	If DFT{x(n)}=X(K) then DFT{X(n)}=Kx((K))$_N$
Option D:	If DFT{x(n)}=X(K) then DFT{x(n)}=Nx((n))$_N$
8.	DIT stands for …….
Option A:	Divide Inverse Transform
Option B:	Divide in time
Option C:	Discret inverse transform
Option D:	Decimation in time
9.	Mathematical equation for rectangular window of length M is …….
Option A:	W(n)=1 for n=0 to (M-1) and W(n)=0 otherwise.
Option B:	W(n)=1 for n=1 to (M-1) and W(n)=-1 otherwise.
Option C:	W(n)= -1 for n=0 to M and W(n)=0 otherwise.
Option D:	W(n)=1 for n=0 to M and W(n)=0 otherwise.
10.	Select correct option among following
Option A:	IIR filters don't have limit cycle oscillations.
Option B:	FIR filters have limit cycle oscillations.
Option C:	FIR filter poles are always located at origin.
Option D:	IIR filters have linear phase characteristic.
11.	Antialiasing filter is required ….
Option A:	before down sampling
Option B:	before up sampling
Option C:	After down sampling
Option D:	After up sampling
12.	Anti-imaging filter is required …..
Option A:	before down sampling
Option B:	before up sampling
Option C:	After down sampling
Option D:	After up sampling
13.	Numbers of complex multiplications in 8 point DFT using direct DFT and FFT are….. …..respectively.
Option A:	64 and 12
Option B:	256 and 13
Option C:	252 and 14
Option D:	16 and 10
14.	For normalization and de-normalization process while converting fixed point to floating point systems……is mainly used.
Option A:	Barrel Shifter
Option B:	Barrel counter
Option C:	Borrow counter

Option D:	Borrow shifter
15.	In IIR filter the nonlinearities due to the finite-precision arithmetic cause
Option A:	Periodic oscillations at the output
Option B:	Non-Periodic oscillations at the input
Option C:	Non-Periodic oscillations at the output
Option D:	Periodic oscillations at the input
16.	Quantization of filter coefficients
Option A:	Do not change transfer function
Option B:	Do not change location of zeros
Option C:	Do not change impulse response
Option D:	Change the location of poles
17.	The truncation error E in a two's complement representation is
Option A:	Always - ∞
Option B:	Always negative
Option C:	Zero
Option D:	Always ∞
18.	Select the incorrect option among the following:
Option A:	During the limit cycle oscillations, the output of the filter oscillates between a finite positive and negative value.
Option B:	Range of amplitude values in limit cycle oscillations is called the Dead band of the filter.
Option C:	IIR filters have limit cycle oscillations.
Option D:	Range of frequency values of limit cycle oscillations is called the Dead band of the filter
19.	SIMD stands for?
Option A:	Single instruction multiple data
Option B:	Single input multiple-data
Option C:	Single instant multiple data
Option D:	Serial instruction many data
20.	How many independent variables are there in speech signal?
Option A:	1
Option B:	2
Option C:	0
Option D:	3

Q2	
A	**Solve any Two 5 marks each**
i.	Compute DFT of x(n) = {0,1,0, -1} using Decimation In time algorithm.
ii.	What is multirate processing? Where it is used? Explain in brief process of Interpolation and Decimation.
iii.	Write a short note on Limit cycle oscillations.
B	**Solve any One 10 marks each**
i.	From H(S) find out H(Z) using impulse invariance method at 5 Hz sampling frequency. H(S)=2/(S+1)(S+2)
ii.	Explain selection criteria's for selecting DSP processor.
Q3.	
A	**Solve any Two 5 marks each**
i.	Find the order of Butterworth digital filter with following specifications: Stopband gain (As)=0.18 Passband gain (Ap) =0.89 Stopband frequency(ws)=0.6π rad/sample, Passband frequency(wp)=0.4 π rad/sample Sampling period is 1 second.
ii.	State and prove time reversal property of DFT.
iii.	Explain the applications of DSP processor in speech signal processing.
B	**Solve any One 10 mark each**
i.	Using the block diagram and spectrum explain the process of interpolation.
ii.	List different window types used in FIR filter design. Describe the different steps of FIR filter design using Windowing method.

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX703 and Course Name: Digital Signal Processing

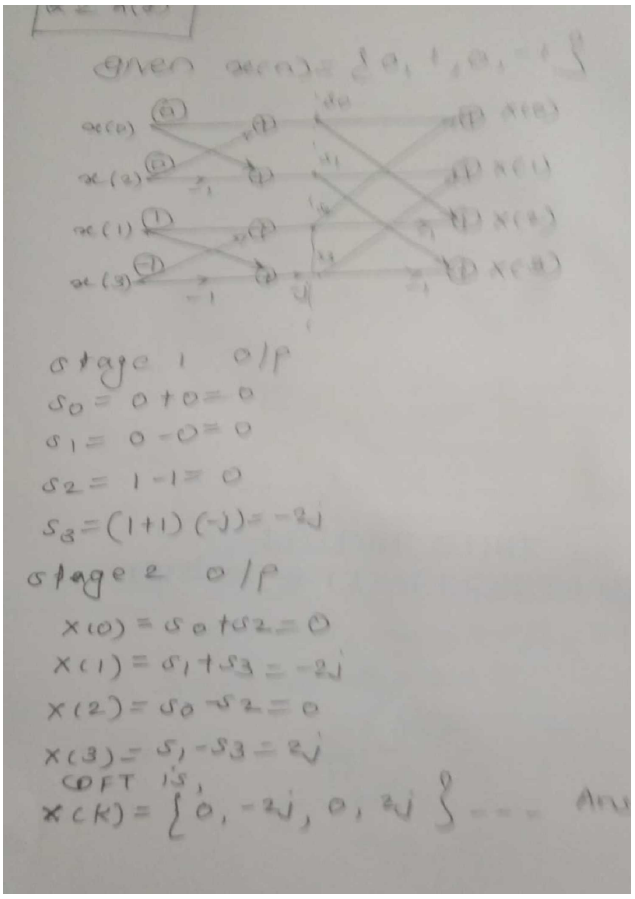
Time: 2 hour Max. Marks: 80

==========

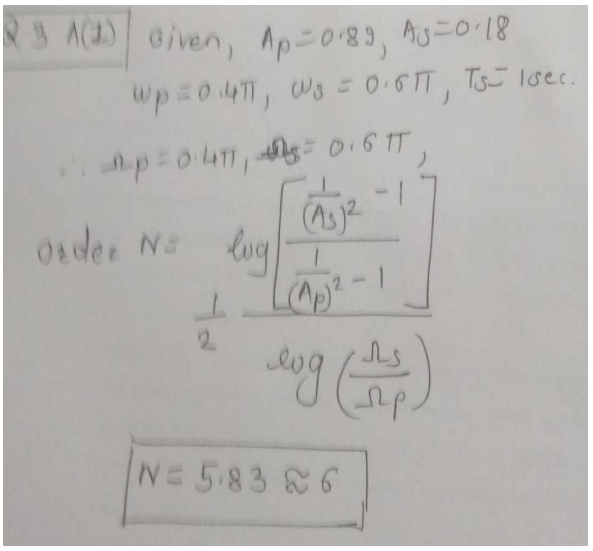
Q1:

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

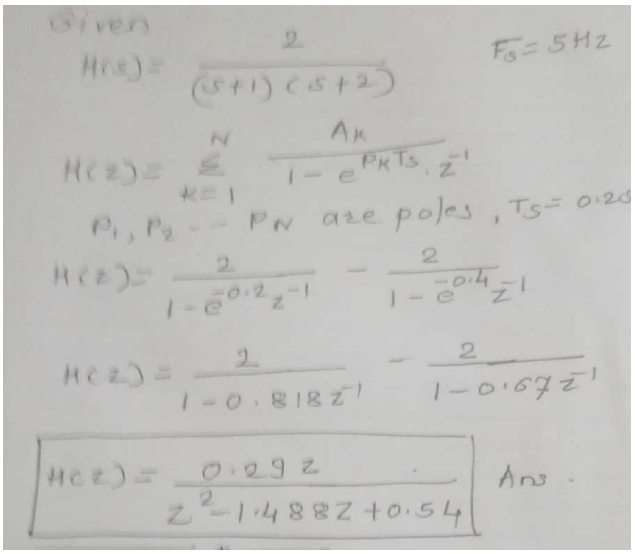
Q2(A) (i)



Q3(A) (i)



Q2(B) (i)



University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7031 and Course Name: Neural Network and Fuzzy Logic

Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Soma in Biological neuron is analogous to _____ in Artificial neuron.
Option A:	Neuron
Option B:	Weights
Option C:	Net input
Option D:	Output
2.	Which of the following parameter controls the amount of weight adjustment at each step of learning?
Option A:	Activation function
Option B:	Momentum Factor
Option C:	Learning rate
Option D:	Threshold
3.	The Weight updation in Hebb rule is given by
Option A:	$w_{i(new)} = w_{i(old)} + x_i y$
Option B:	$w_{i(new)} = w_{i(old)} + \alpha\, t\, x_i$
Option C:	$w_{i(new)} = w_{i(old)} + \alpha\,(t - y_{in})x_i$
Option D:	$w_{i(new)} = w_{i(old)} + \alpha\,(1 - y_{in})x_i$
4.	Calculate the net input for the simple neural network, where input vector [x1 x2,x3]=[0.3,0.5,0.6] and the weight are [w1 w2 w3]=[0.2,0.1,-0.3].
Option A:	-0.05
Option B:	-0.07
Option C:	1.2
Option D:	0.56
5.	Which of the following activation function used in Back Propagation Network?
Option A:	Identity Function
Option B:	Bipolar Step Function
Option C:	Bipolar Sigmoid Function
Option D:	Binary Step Function
6.	ADALINE network trained using learning rule.

Option A:	Perceptron
Option B:	Hebb
Option C:	Delta
Option D:	Winner Take All
7.	Which neural network involves backward links from output to the input and hidden layers.
Option A:	Perceptron neural network
Option B:	Multiple Adaptive Neural Network
Option C:	Multilayer Perceptron Neural Network
Option D:	Recurrent Neural Network
8.	LVQ stands for
Option A:	Linear Vector Quantization
Option B:	Learning Vector Quantization
Option C:	Learning Vector Quantifier
Option D:	Linear Vector Quantifier
9.	In which of the following _____ neural network, the weights that are connected from the hidden layer to the output layer are fixed, positive and possess equal values.
Option A:	ADALINE
Option B:	Back Propagation Network
Option C:	MADALINE
Option D:	Radial Basis Function Network
10.	In case of Back Propagation Learning Network, a large learning rate leads to .
Option A:	rapid learning but there is oscillation of weights
Option B:	slower learning but there is oscillation of weights
Option C:	Moderate learning but there is oscillation of weights
Option D:	Steady learning but there is oscillation of weights
11.	Which of the following is a type of unsupervised learning network?
Option A:	Radial Basis Function Network
Option B:	Bidirectional Associative Memory Network
Option C:	Adaptive Resonance Theory Network
Option D:	Adaline Network
12.	In a Maxnet with 4 neurons, net inputs are -0.216, -0.072, 0.126 and 0.504. What will be the result of applying activation function to these net inputs?
Option A:	0.216, 0.072, 0.126. and 0.504
Option B:	0, 0, 0.126. and 0.504
Option C:	0, 0, 1 and 1
Option D:	-1, 1, 1 and 1
13.	Find the weight vector of the autoassociative network for input vector [1 1 -1].
Option A:	$[1\ 1\ -1\ 1\ 1\ -1\ 1\ 1\ 1]$
Option B:	$[1\ 1\ -1\ 1\ 1\ -1\ 1\ -1\ 1]$
Option C:	$[1\ 1\ -1\ 1\ 1\ -1\ -1\ -1\ 1]$

Option D:	$[1\ 1\ 1\ 1\ 1\ \ -1\ 1\ \ -1\ 1]$
14.	In a Bidirectional Associative Memory network, if W is weight matrix from input to output side, the weight matrix from output to input side is _____.
Option A:	Transpose of W
Option B:	W
Option C:	Inverse of W
Option D:	1/W
15.	The Hopfield network is _____ fully interconnected single-layer feedback network.
Option A:	Autoassociative
Option B:	Hetroassociative
Option C:	Bidirectional Associative
Option D:	Fixed weight
16.	Which of the following is used as training algorithm for pattern association Network.
Option A:	Outer Product Rule
Option B:	Perceptron Learning Rule
Option C:	Delta rule
Option D:	Kohonen's Learning Rule
17.	In Mexican hat neural network, the neurons present farther away are part of
Option A:	Region of cooperation
Option B:	Region of competition
Option C:	Region of Interaction
Option D:	Region of opposition
18.	Last element in the cartesian product of fuzzy sets, $\underline{A} = \{\frac{0.3}{x1} + \frac{0.7}{x2} + \frac{1}{x3}\}$ and $B = \{\frac{0.4}{y1} + \frac{0.9}{y2}\}$ is
Option A:	0.3
Option B:	0.4
Option C:	0.7
Option D:	0.9
19.	Which of the following defuzzification method also known as the middle of the maxima?
Option A:	Centroid method
Option B:	Weighted average method
Option C:	Mean-Max Membership
Option D:	First of Maxima
20.	What is maximum value of the membership function in a fuzz set
Option A:	0
Option B:	0.5
Option C:	Infinite
Option D:	1

<table>
<tr><td>Q2.
(20 Marks Each)</td><td>Solve any Two Questions out of Three 10 marks each</td></tr>
<tr><td>A</td><td>Explain Perceptron Learning Algorithm and develop perceptron network to implement two input OR gate with binary input and bipolar target. Also, the learning rate is 1 and threshold is 0.2.</td></tr>
<tr><td>B</td><td>Explain Radial Basis Function Network algorithm with the help of flowchart.</td></tr>
<tr><td>C</td><td>Explain with diagram and training algorithm the Kohonen's Self organized Feature map neural network and its applications.</td></tr>
</table>

<table>
<tr><td>Q3.
(20 Marks Each)</td><td>Solve any Two Questions out of Three 10 marks each</td></tr>
<tr><td>A</td><td>What is the need for defuzzification? Explain any four techniques of defuzzification.</td></tr>
<tr><td>B</td><td>Train the heteroassociative memory network using outer products rule to store input row vectors s =
(s1,s2, s3,s4) to the output row vectors t = (t1, t2).
Use the vector pairs as given in Table
<table>
<tr><td>Input and targets</td><td>S1</td><td>S2</td><td>S3</td><td>S4</td><td>t1</td><td>t2</td></tr>
<tr><td>1st</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>2nd</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr>
<tr><td>3rd</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>1</td></tr>
<tr><td>4th</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>C</td><td>Describe face recognition using Neural Network.</td></tr>
</table>

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7031 and Course Name: Neural Network and Fuzzy Logic

Time: 2 hour Max. Marks: 80

==========

Q1:

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

Q2(A):

Explain Perceptron Learning Algorithm and develop perceptron network to implement two input OR gate with binary input and bipolar target. Also, the learning rate is 1 and threshold is 0.2.

Ans: In case of the perceptron learning rule, the learning signal is the difference between desired and actual response of a neuron. The perceptron learning rule is explained as follows:
Consider a finite *"n"* number of input training vectors, with their associated target {desired} values *x(n)* and t(n), where *"n"* ranges from 1 to *N.* The target is either + 1 or -1. The output *"y"* is obtained on the basis of the net input calculated and activation function being applied over the net input.

y= $f(y_{in})$ ={1 $if\ y_{in} > \theta\ 0$ $if\ -\theta \leq y_{in} \leq \theta\ -1$ $if\ y_{in} < -\theta$

The weight updation in case of perceptron learning is shown
If y ≠ t , then

$$w_{(new)} = w_{(old)} + \alpha\, t\, x$$

else

$$w_{(new)} = w_{(old)}$$

The Truth table for OR function with binary inputs and bipolar targets is shown in table

X1	X2	T
1	1	1
1	0	1
0	1	1
0	0	-1

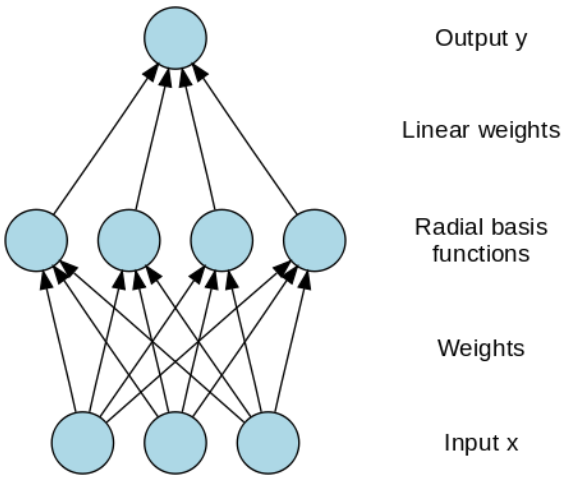
The initial values of the weights and bias are taken as zero, i.e.,
W1=W2= b =0
Also, the learning rate is 1 and threshold is 0.2. So, the activation function becomes

y= $f(y_{in}) = \{1\ \ if\ y_{in} > 0.2\ \ 0\ \ if\ -0.2 \leq y_{in} \leq 0.2$

The network is trained as per the perceptron training algorithm. Table gives the network training for 1 epoch

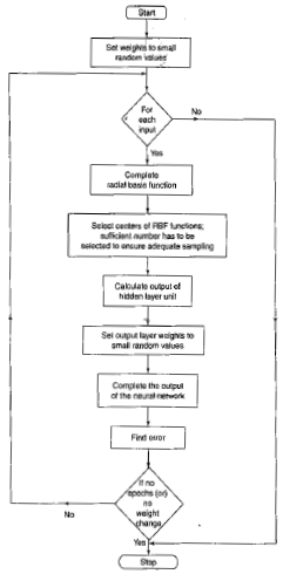
X1	X2	1	t	yin	y	Δw1	Δw2	Δw3	W1	W2	B
1	1	1	1	0	0	1	1	1	1	1	1
1	0	1	1	2	1	0	0	0	1	1	1
0	1	1	1	2	1	0	0	0	1	1	0
0	0	1	-1	1	1	0	0	-1	1	1	0

Q.2 (B) Explain Radial Basis Function Network algorithm with the help of flowchart.

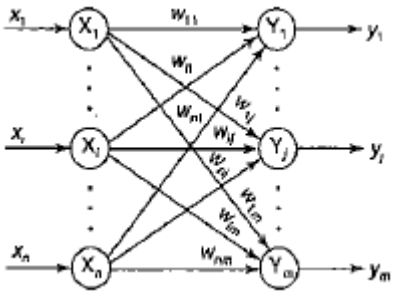


In **Single Perceptron / Multi-layer Perceptron(MLP)**, only have linear separability because they are composed of input and output layers(some hidden layers in MLP)
For example, AND, OR functions are **linearly**-separable & XOR function is **not** linearly separable.
At least **one hidden layer** to derive a non-linearity **separation**.
Our RBNN what it does is, it transforms the input signal into another form, which can be then **feed** into the network to **get linear separability.** RBNN is **structurally same** as perceptron (MLP). RBNN is composed of **input, hidden,** and **output** layer. RBNN is **strictly limited** to have exactly **one hidden layer**. We call this hidden layer as **feature vector.** RBNN **increases dimension** of feature vector.

Flow chart



Q.2 C) Explain with diagram and training algorithm the Kohonen's Self organized Feature map neural network and its applications



The **Self-Organizing Map (SOM)**, commonly also known as **Kohonen network** (Kohonen 1982, Kohonen 2001) is a computational method for the visualization and analysis of high-dimensional data, especially experimentally acquired information.
The architecture consists of two layers: input layer and output layer (duster). There are *"n"* units in the input layer and *"m"* units in the output layer. Basically, here the winner unit *is* identified by using either dot product or Euclidean distance method and the weight updation using Kohonen learning rules is performed over the winning duster unit.

Step 0:
- Initialize the weights w_{ij}: Random values may be assumed. They can be chosen as the same range of values as the components of the input vector. If information related to distribution of clusters is known, the initial weights can be taken to reflect that prior knowledge.
- Set topological neighborhood parameters: As clustering progresses, the radius of the neighborhood decreases.
- Initialize the learning rate α: It should be a slowly decreasing function of time.

Step 1: Perform Steps 2–8 when stopping condition is false.

Step 2: Perform Steps 3–5 for each input vector x.

Step 3: Compute the square of the Euclidean distance, i.e., for each $j = 1$ to m,

$$D(j) = \sum_{i=1}^{n} \sum_{j=1}^{m} (x_i - w_{ij})^2$$

Step 4: Find the winning unit index J, so that D(J) is minimum. (In Steps 3 and 4, dot product method can also be used to find the winner, which is basically the calculation of net input, and the winner will be the one with the largest dot product.)

Step 5: For all units j within a specific neighborhood of J and for all i, calculate the new weights:

$$w_{ij}(\text{new}) = w_{ij}(\text{old}) + \alpha [x_i - w_{ij}(\text{old})]$$

or

$$w_{ij}(\text{new}) = (1 - \alpha) w_{ij}(\text{old}) + \alpha x_i$$

Step 6: Update the learning rate α using the formula $\alpha(t + 1) = 0.5\alpha(t)$.

Step 7: Reduce radius of topological neighborhood at specified time intervals.

Step 8: Test for stopping condition of the network.

Q.3 A) What is the need for defuzzification? Explain any four techniques of defuzzification.

Defuzzification is the process of conversion of fuzzy quantity into a precise quantity.

Defuzzification methods include:

[1] max membership principle.

[2] centroid method.

[3] weighted average method.

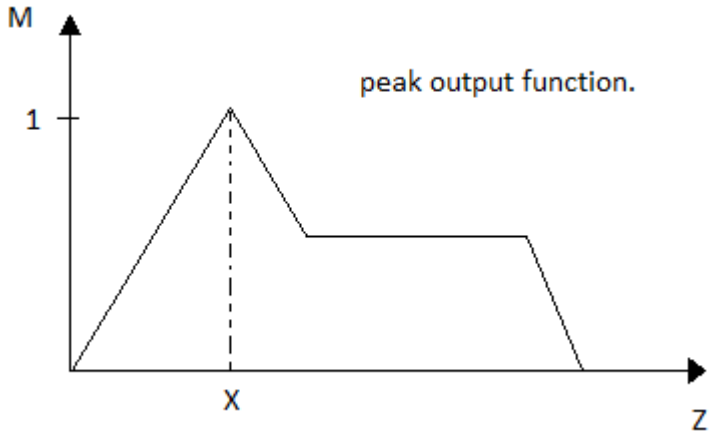
[4] mean max membership.

[5] center of sums.

[6] centre of largest area.

[7] first of maxima, last of maxima.

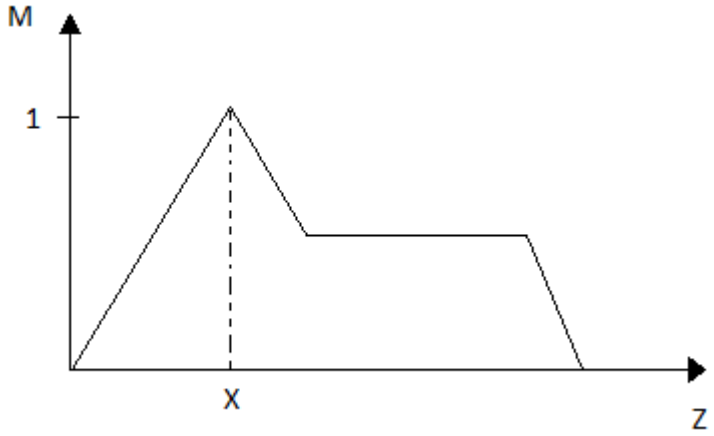
[1] Max – membership principle:



M c (x∗) > M c (x)M c (x∗) > M c (x) for all x ∈∈ X

[2] Centroid method: centre of mall, centre of gravity or area.

XA=∫Ms(x).xdx∫Mc(x).dxXA=∫Ms(x).xdx∫Mc(x).dx



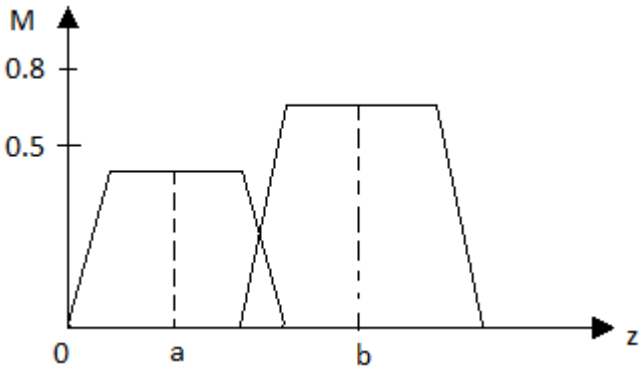
[3] Weighted average method: Valid for symmetrical output membership function.

Each membership function is weighted by its max membership value.

X∗=∑Mc(xi)¯.xp¯∑MC(xi)¯X∗=∑Mc(xi)¯.xp¯∑MC(xi)¯

Xi¯Xi¯ = maximum of with member function.

∑∑ = algebraic sum.

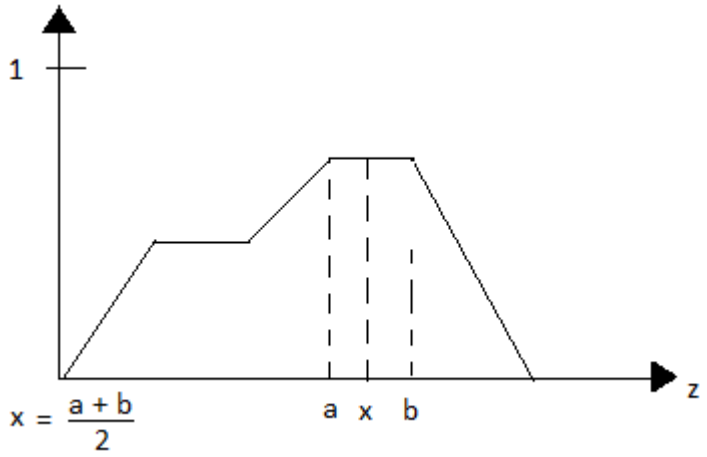


x∗=0.5a+0.8b0.5+0.8x∗=0.5a+0.8b0.5+0.8

[4] Mean max membership method:

This is known as middle of the maxima.

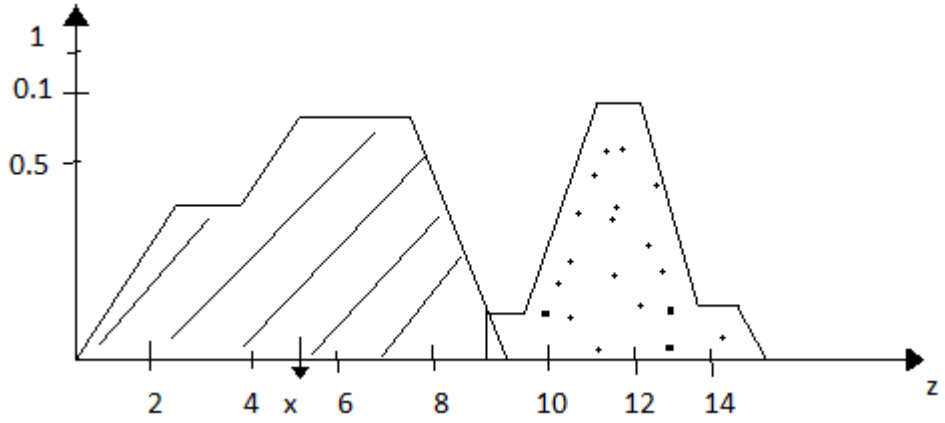
$X*=\sum ni=1xp^{-}nX*=\sum i=1nxp^{-}n$



[5] Centre of sums: Algebraic sum of individual fuzzy the union, here, interesting areas are value twice, the defuzzified value X+X+
$X*=\int xX\sum nizMCI(x)dx\int x\sum nizMci(x)dxX*=\int xX\sum iznMCI(x)dx\int x\sum iznMci(x)dx$

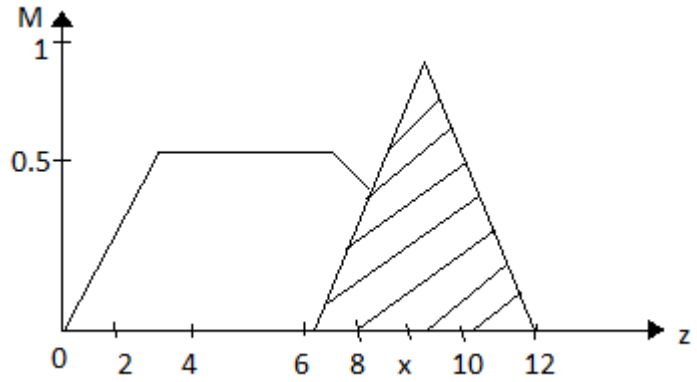
[6] Centre of largest area: When output consists of at least two converse fuzzy subsets which are not overlapping. When o/p fuzzy set has at least two converse regions, then the centre of gravity of converse fuzzy sub region having the largest area is used to obtain defuzzified value.

$X*=\int mci(x).xdx\int mci(x)dxX*=\int mci(x).xdx\int mci(x)dx$



[7] first of maxima (last of maxima)

This method uses the overall output or union of all individual output fuzzy sets ci for determining the smallest value of the domain maximized membership in ci.



Q.3 B) Train the heteroassociative memory network using outer products rule to store input row vectors *s* =
(s1,s2, s3,s4) to the output row vectors *t* = *(t1,* t2).
Use the vector pairs as given in Table

Input and targets	S1	S2	S3	S4	t1	t2
1st	1	0	1	0	1	0
2nd	1	0	0	1	1	0
3rd	1	1	0	0	0	1
4th	0	0	1	1	0	1

Solution:

$$W = \sum_{p=1}^{4} s^T(p)\, t(p)$$

$$= s^T(1)t(1) + s^T(2)t(2) + s^T(3)t(3) + s^T(4)t(4)$$

$$= \begin{bmatrix} 1 & 0 \\ 0 & 0 \\ 1 & 0 \\ 0 & 0 \end{bmatrix} + \begin{bmatrix} 1 & 0 \\ 0 & 0 \\ 0 & 0 \\ 1 & 0 \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ 0 & 1 \\ 0 & 0 \\ 0 & 0 \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 0 & 1 \\ 0 & 1 \end{bmatrix}$$

$$W = \begin{bmatrix} 2 & 1 \\ 0 & 1 \\ 1 & 1 \\ 1 & 1 \end{bmatrix}$$

Q.3 C) Describe face recognition using neural network.
This system is implemented in two stages. They are the learning stage and the testing stage. Image acquisition, preprocessing, image filtering, feature extraction and learning are included in the learning stage. At first the system takes the image of a person. The input image is then converted to a gray scale image and the position of the face is detected from the image after highpass filtering and edge detection. The features, gray levels of the image are extracted which can be represented as a matrix and this feature matrix is given as input for the Kohonen self organizing map and fed to this network. The unsupervised learning network is trained and creates a knowledge base for future use. In the testing stage the system takes the face of the image of a person for recognition. Image acquisition, pre-processing, image filtering, feature extraction are

similar to the learning stage. For classification the features are fed to the network. The network will classify the face image from the knowledge base and recognizes it.

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7032 and Course Name: Advance Networking Technologies

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 Layer is not found in layered model of WLAN?
Option A:	Application
Option B:	Physical
Option C:	LLC
Option D:	MAC
2.	How many virtual paths are available in Asynchronous Transfer Mode (ATM)?
Option A:	23
Option B:	21
Option C:	32
Option D:	256
3.	IEEE 802.11 standard uses which of the following encryption technique?
Option A:	WEP
Option B:	WAP
Option C:	AES
Option D:	DES
4.	Zigbee protocol stack has consist of which of following layers?
Option A:	Application, Network, Security, MAC, and Physical Layer
Option B:	Physical, Network, security layer
Option C:	Physical, data link and application layer
Option D:	Data link, Network and Transport layer
5.	IEEE 802.15.4f is popularly known as ----------
Option A:	Bluetooth
Option B:	Zigbee
Option C:	Active RFID
Option D:	UWB
6.	In Bluetooth, Segmentation and reassembly is done at following layer
Option A:	Link manager
Option B:	L2CAP layer
Option C:	Radio Layer
Option D:	Baseband Layer

7.	Bluetooth operating range of Class 2 radio device is up to .
Option A:	1 meter
Option B:	10 meters
Option C:	100 meters
Option D:	50 meters
8.	In SONET, STS-3 signal has number of rows.
Option A:	90
Option B:	27
Option C:	270
Option D:	9
9.	Erbium Doped Fiber Amplifier (EDFA) works on the principle of _____ of photons.
Option A:	Spontaneous Emission
Option B:	Thermionic Emission
Option C:	Field Emission
Option D:	Stimulated Emission
10.	The advantage of DWDM is .
Option A:	Multiplies capacity of Network
Option B:	Low cost
Option C:	Lower data rates
Option D:	Complicated transmitters and receivers
11.	Packet filtering firewalls work effectively in networks.
Option A:	Very simple
Option B:	Smaller
Option C:	Large
Option D:	Very large complex
12.	_____causes more internetwork traffic.
Option A:	Ubiquitous access
Option B:	Hierarchical Access
Option C:	Local access
Option D:	Global access
13.	One of the goals of network security is to maintain authentication of message. This means_____.
Option A:	The message must arrive at the receiver exactly as it was sent
Option B:	The sender and receiver must expect privacy of the message
Option C:	Assure availability of the message at the receiver
Option D:	The receiver must ensure that message is coming from the authorized sender
14.	We can compare the task of network management to the task of writing a program. Both tasks need variable declarations. In network management this is handled by _____.
Option A:	SNMP

Option B:	MIB
Option C:	SMI
Option D:	Agent
15.	_____this is the backbone of the network. It needs to be_____
Option A:	Core layer, reliable and high speed.
Option B:	Distribution layer, reliable and slow
Option C:	Core layer, non reliable and slow
Option D:	Access layer, reliable and high speed
16.	In _____, the router forwards the received packet through only one of its interfaces.
Option A:	Unicasting
Option B:	Multicasting
Option C:	Broadcasting
Option D:	Forecasting
17.	The metric of Routing Information Protocol is .
Option A:	Cost
Option B:	Hop count
Option C:	Bandwidth
Option D:	Delay
18.	In OSPF header, which field is used to detect errors in the packet?
Option A:	Type
Option B:	Area ID
Option C:	Authentication type
Option D:	Checksum
19.	Which of the following is not a second level cloud attributes?
Option A:	Applications
Option B:	Infrastructure
Option C:	Database
Option D:	Storage
20.	In this type of cloud, the cloud is composed of multiple internal or external clouds.
Option A:	Private
Option B:	Public
Option C:	Protected
Option D:	Hybrid

Q.2 20 Marks Each)	**Solve any Four, each question carries 5 marks**
A	Draw and Explain Zigbee protocol stack.
B	Describe the various types of firewalls, explain any one of them.
C	Draw and explain IEEE 802.11 architecture.

D	Explain the steps for access layer design.
E	Compare the protocols Routing Information Protocol (RIP) and Open Shortest Path First (OSPF).
F	Explain SPI framework of cloud computing.

Q.3 20 Marks Each)	**Solve any Four, each question carries 5 marks**
A	Explain the different states of Bluetooth enabled device.
B	Draw and explain UNI and NNI frame format for Asynchronous Transfer Mode (ATM).
C	Draw and explain Frame format for STS-1 in SONET.
D	Explain features and various messages in Border Gateway Protocol (BGP).
E	Write a short note on Wireless Sensor Network (WSN).
F	With respect to network management explain following terms: a) Documentation b) OAM & P

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7032 and Course Name: Advance Networking Technologies

Time: 2-hour Max. Marks: 80

==========

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

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ELXDLO7033 and Course Name: Robotics

Time: 2 hour Max. Marks: 80

==========

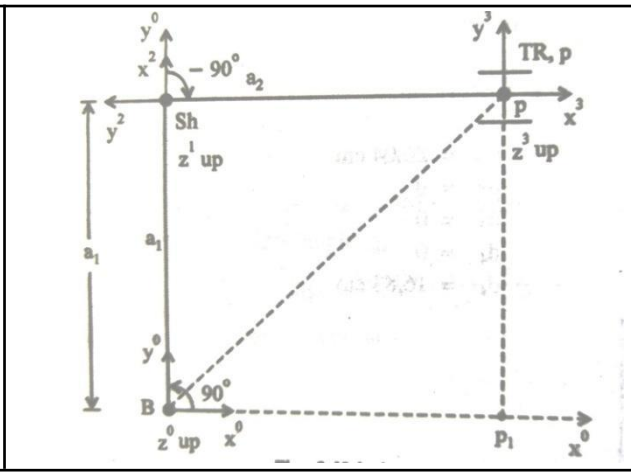
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	A point p $(5, 6, 7)^T$ is attached to a rotating frame. The frame rotates 90 degree about y-axis of the reference frame. Find the coordinates of the point relative to the reference frame after rotation.
Option A:	$p_x = -7; p_y = 6; p_z = -5$
Option B:	$p_x = 7; p_y = -6; p_z = 5$
Option C:	$p_x = 7; p_y = 6; p_z = -5$
Option D:	$p_x = -7; p_y = -6; p_z = 5$
2.	The Denavit-Hartenberg transformation is given by _____.
Option A:	$A_i = Trans_{z,\,di} R_{z,\theta i} Trans_{x,\alpha i} R_{x,\alpha i}$
Option B:	$A_i = R_{z,\theta i} Trans_{z,\,di} R_{x,\alpha i} Trans_{x,\alpha i}$
Option C:	$A_i = R_{z,\theta i} R_{x,\theta i} Trans_{z,di} Trans_{x,\alpha i}$
Option D:	$A_i = R_{z,\theta i} Trans_{z,\,di}\, Trans_{x,\alpha i} R_{x,\,\alpha i}$
3.	The four quantities a_i, α_i, d_i, andθ_i in D-H transformation, associated with link i and joint i are called as _____ respectively
Option A:	Link length, link angle, link offset, and joint angle
Option B:	Link offset, link angle, link length, and joint twist
Option C:	Link length, link twist, link offset, and joint angle
Option D:	Link offset, link twist, link length, and joint angle
4.	Rotation of θa about the a-axis (z-axis of moving frame) is called _____.
Option A:	Pitch
Option B:	Yaw
Option C:	Twist
Option D:	Roll
5.	The lower part (half of the rows) of the Jacobian matrix is called as _____.
Option A:	Linear velocity Jacobian
Option B:	Angular velocity Jacobian
Option C:	Linear Acceleration Jacobian
Option D:	Angular acceleration Jacobian
6.	If K is the kinetic energy of the system and P is potential energy of the system then Lagrangian L is given by _____.
Option A:	L = - K – P

Option B:	L = P – K
Option C:	L = K +P
Option D:	L = K – P
7.	Dynamic equations of a Robot can be derived by _____ .
Option A:	Differentiating the potential energy with respect the joint variables
Option B:	Differentiating the kinetic energy with respect the joint variables
Option C:	Differentiating the Lagrangian equation with respect to joint variables
Option D:	Differentiating the Lagrangian equation with respect to Link parameters
8.	The three degrees of freedom a 'wrist' has are _____
Option A:	Roll, Pitch, Yaw
Option B:	Reach, Patch, Jaw
Option C:	Stroke, Patch, Yaw
Option D:	Roll, Pitch, Jaw
9.	The ability of the Robot to position the tool in the same place again and again is called as .
Option A:	Accuracy
Option B:	Repeatability
Option C:	Precision
Option D:	Efficiency
10.	The aim of robot's trajectory planning is to
Option A:	determine its collision-free path
Option B:	determine its time-optimal path
Option C:	avoid its singularity condition
Option D:	ensure smooth variations of the robotic joint angles.
11.	The path includes several continuous motion trajectories that need _____
Option A:	Trajectory planning
Option B:	Path planning
Option C:	Motion Planning
Option D:	Organization
12.	There are n paths (solutions) in 3D space to move from S to g because IK is
Option A:	Unique
Option B:	Not Unique
Option C:	zero
Option D:	One
13.	It is easier to produce a straight line motion /path in case of xyz, SCARA, cylindrical robots, but it is difficult in case of articulated robots. Therefore an algorithm is used to achieve this.
Option A:	Bounded Deviation
Option B:	Edge detection
Option C:	D-H
Option D:	Rounded Deviation
14.	Kinematic diagram of a manipulator represents the

Option A:	nature of the robotic joints with the help of some symbols
Option B:	relative motions of the robotic links
Option C:	joint torques
Option D:	joint forces
15.	4-3-4 polynomials has following boundary conditions in a pick and place operation in time
Option A:	6 passages,4 initial/final velocity/acceleration ,4 continuity
Option B:	4 passages,6 initial/final velocity/acceleration ,4 continuity
Option C:	4 passages,4 initial/final velocity/acceleration ,4 continuity
Option D:	6 passages,4 initial/final velocity/acceleration ,6 continuity
16.	A trajectory planning in Cartesian space
Option A:	Allows a more direct visualization of the generated path
Option B:	Does not allow a more direct visualization of the generated path
Option C:	sometimes allow a more direct visualization of the generated path
Option D:	Never allow a more direct visualization of the generated path
17.	In Swell operators, the number of foreground pixels in swollen image is always
Option A:	Greater the number of foreground pixels in the original image
Option B:	Less than the number of foreground pixels in the original image
Option C:	Equals to the number of foreground pixels in the original image
Option D:	Independent to the number of foreground pixels in the original image
18.	When an object is viewed from different directions and at different distances, the appearance of the object will be different. Such view is called
Option A:	oblique projection
Option B:	perspective view
Option C:	axonometric projection
Option D:	isometric projection
19.	In computer vision, the purpose of using thresholding is to
Option A:	store image as an array of pixels
Option B:	convert analog information of light intensity into digital form
Option C:	remove noise from the image
Option D:	obtain a distinction between the object and background
20.	Fine-motion Planning deals with
Option A:	uncertainty by creating a sensor-based plan that will work regardless of the exact conditions.
Option B:	certainty by creating a sensor-based plan that will work regardless of the exact conditions.
Option C:	uncertainty by creating a sensor-based plan that will work dependent on the exact conditions.
Option D:	certainty by creating a sensor-based plan that will work dependent the exact conditions.

Q2. **(20 Marks Each)**	
A	**Solve any Two 5 marks each**
i.	Explain Edge Detection Algorithm in detail.
ii.	Explain Denavit-Hartenberg Algorithm in detail.
iii.	Explain Generalized Voronoi Diagram in detail.
B	**Solve any One** **10 marks each**
i.	What are the template matching techniques? Explain Normalized Cross Correlation in detail for an image 2 1 0 0 3 0 0 5 0 0 0 4 0 6 0 1 0 5 0 0 For a mask/template 0 4 0 3 0 5 0 4 0
ii.	A robot joint has to move from an initial angle of θ_0=300 degrees to the final value of θ_f=150degreesin 5 seconds. Find the cubic polynomial to generate smooth trajectory for the joint. Assume zero velocity at the starting and ending of the path. What is maximum velocity and acceleration for this trajectory?

Q3. **(20 Marks Each)**	
A	**Solve any Two 5 marks each**
i.	Explain Run Length Encoding Algorithm in detail.
ii.	Explain Fine Motion Planning in detail.
iii.	Explain Perspective Transformation in detail.
B	**Solve any One** **10 marks each**
i.	Explain Shrink operators, their usage and comment on convergence for the image given below 0 0 0 0 0 0 1 1 1 1 1 0 0 0 1 1 1 0 0 0 1 1 1 0 0 0 0 0 0 0
ii.	For the three axis planar articulated robot shown in the figure, find the joint variables q when the first two links form a right angled triangle, given TCV as $W(q)=\{a2,a1,d3,0,0,1\}^T$.

y0
x2
– 90° a2
y3
TR, p
Sh
y2
z1 up
p
x3
z3 up
a1
a1
y0
B
90°
z0 up
x0
p1
x0

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examination Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ELXDLO7033 and Course Name: Robotics

Time: 2 hour Max. Marks: 80

==========

Q1:

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

Q17.	**A**
Q18.	**B**
Q19.	**D**
Q20.	**A**

Important steps and final answer for the questions involving numerical example

Q2(B)(i)

Average Intensity of the template is $||T||=8.124$**.The values for NCC of the translated template with image are**

$\sigma(0,0)= 45/55.1=0.817$
$\sigma(0,1)= 0/77.1=0.000$
$\sigma(0,2)= 39/70.0=0.557$
$\sigma(1,0)= 0/66.5=0.000$
$\sigma(1,1)= 82/82.1=0.999$
$\sigma(1,2)= 0/75.3=0.000$

The best match Occurs at σ(1,1)=0.999.Hence a good match is found

Q2(B)(ii)

$\theta_0=300$,$\theta_f=1500$,$\Delta t=t=5$ *seconds*
$\theta_0'=00$ $\theta_5'=00$

The cubic polynomial is given by

$\theta(t)=a\,t^3+b\,t^2+ct+d$

When t=0 seconds the joint is at the initial position.
Substitution t=0 in the expression for θ(t),we get
$\theta_0(t)=d=30$
$\theta_0'(t)=3\,at^2+2\,bt+c\theta_0'=c=velocity=0$
$\theta_0''(t)=6\,at+2\,b,\ \theta_0''(0)=2\,b$

When t= 5 seconds, the joint is at ending position
$\theta(5)=a(5)^3+b(5)^2+c(5)+d$
$1500=125a+25b+0(5)+300$
$150-30=125a+25b=1200$
$\theta_0'(5)=3\,a5^2+2b\,5+c$
$0=75a+10b$

Solvingthe w_o equations by simultaneous method or by determinant method, we get values of a,b,c.

$$\begin{bmatrix} 75 & 10 \\ 125 & 25 \end{bmatrix}\begin{bmatrix} a \\ b \end{bmatrix}=\begin{bmatrix} 0 \\ 120 \end{bmatrix};\ \Delta=625$$

$$\Delta_1=\begin{bmatrix} 0 & 10 \\ 120 & 25 \end{bmatrix}=-1200;\ a=\Delta_1/\Delta=-1200/625=-1.92$$

$$\Delta_2=\begin{bmatrix} 75 & 0 \\ 125 & 120 \end{bmatrix}=9000;\ b=\Delta_2/\Delta=9000/625=14.4$$

a=-1.92;b=14.4;c=0;d=300
The cubic polynomialis given by the position$\theta(t)=-1.92\ t^3+14.4\ t^2+30$
The velocity will be $\theta'(t)=3\ a\ t^2+2\ bt+\ c=-5.76\ t^2+28.8\ t$
The acceleration will be $\theta''(t)=6\ at+2b=-11.52\ t+28.8$

Time	Displacement	Velocity	Acceleration
0	30	0	28.8
1	42.48	23.04	17.28
2	72.24	34.56	5.76
3	107.76	34.56	-5.76
4	137.52	23.04	-17.28
5	150	0	-28.8

Q3(B)(i):

Sharp projections can be removed which are at (2,1) and (2,2) as a noise.
Apply Shrink(6) .At (1,1);p(k,j)=2
Shrink(6)=0 AND 1(6-1-[8-2])
=0 AND 1(- 2)
=0 AND 0
=0
That is pixel at (1,1) is retained as it is .Like this proceed till(1,6).
At(2,1): p(k,j)=1
Shrink(6)=1 AND 1(6-1-[8-1])
=1 AND 1(-1)
=1 AND 0
=0
That is pixel at (2,1) is converted to 0. .Therefore the new image after applying Shrink at (2,1) is
0 0 0 0 0 0
0 1 1 1 1 0
0 0 1 1 1 0
0 0 1 1 1 0
0 0 0 0 0 0
At(2,2): p(k,j)=2
Shrink(6)=1 AND 1(6-1-[8-2])
=1 AND 1(-1)

=1 AND 0
=0
That is pixel at (2,2) is converted to 0. .Therefore the new image after applying Shrink at (2,2) is

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

Q3(B)(ii)

For the three axis planar articulated robot shown in the figure,Find the joint variables q when the first two links form a right angled triangle,given TCV as $W(q)=\{a2,a1,d3,0,0,1\}^T$.

$W=[a2\ a1\ d3\ 0\ 0\ 1]^T=[w1\ w2\ w3\ w4\ e5\ w6]^T$ Therefore

$W1=a2; w2=a1; w3=d3; w4=0; w5=0; w6=1$

Computation of shoulder joint angle $q2=\theta2$:

$q2=\pm\cos^{-1}[w1^2+w2^2-a1^2-a2^2/2\ a1\ a2\ ]=\pm\cos^{-1}[a2^2+a1^2-a1^2-a2^2/2\ a1\ a2\ ]$

$q2=\pm\cos^{-1}[\ 0/2\ a1\ a2\ ]=\cos^{-1}[0]=\pm\ \pi/2$ radians$=\pm90^0$

Computation of base joint angle q1=θ1:

When

$q2=\theta2=\pm90^0$

$q1=\pm\tan^{-1}[a1^2\text{-}a2^2/2a1a2]$

$q1=\pm\tan^{-1}[0/2a1^2]$

$q1=\pm\tan^{-1}[0/2a2^2]$

If a1=a2, then

$q1=\pm\tan{-}1\ [\ 0/2\ a2\ a1\ ]=\pm\tan{-}1[\ 0/2\ a2\ a1\ ]=0$

When θ2=-90

$q1=\pm\tan^{-1}[a1^2+a2^2/2a1a2]$

$q1=\pm\tan^{-1}[a1^2+a2^2/2a1a2]$

$q1=\pm\tan^{-1}[a1^2+a2^2/0\ ]=\pm\tan{-}1\ (\infty)=\pi/2=90$

Computation of Tool Roll Angle q3=θ3:

$q3=\pi\ ln\sqrt{w4^2+w5^2+w6^2}=\pi\ ln\sqrt{0^2+0^2+1^2}=\pi\ ln(1)=0$

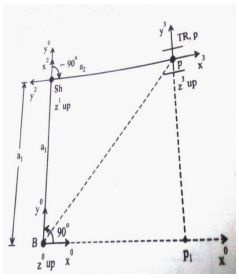
Therefore the Inverse Kinematic Problem solution for Three-Axis Planar Robot is

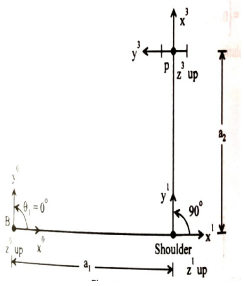
$q=\theta=\{\pi/2,-\pi/2,0\ \}^T$

Or

$q=\theta=\{0\ ,\pi/2,\ 0\}^T$

This is shown in the figures below





University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 15th June 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2016
Examination: BE Semester VII
Course Code: ELXDLO7034 and Course Name: Integrated Circuit 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.	Which type of Si is 99.999999% pure?
Option A:	Sand
Option B:	MGS
Option C:	EGS
Option D:	CGS
2.	Which of the following is one dimensional crystal defect?
Option A:	Line defect
Option B:	Point defect
Option C:	Area defect
Option D:	Volume defect
3.	The process of collecting the unwanted element in regions of the chip where they do minimal harm:_____.
Option A:	Gettering
Option B:	Epitaxial growth
Option C:	Wafer cleaning
Option D:	Clean factories
4.	The predeposition and drive in are two steps in _____ process.
Option A:	Ion implantation
Option B:	Diffusion
Option C:	Oxidation
Option D:	Deposition
5.	Vapor phase epitaxy is based on which one of the following_____.
Option A:	chemical vapor deposition
Option B:	Diffusion
Option C:	physical vapor deposition
Option D:	thermal oxidation

6.	The_____ process utilizes the different rates of oxidation of silicon and silicon nitride, which is used for local masking.
Option A:	LOCOS
Option B:	Shallow trench isolation
Option C:	Deep trench isolation
Option D:	Junction Isolation
7.	In Ion implantation, _____ is the process where an energetic ion penetrating a material loses its energy to the target electrons.
Option A:	nuclear stopping
Option B:	mechanical stopping
Option C:	electronic stopping
Option D:	electric stopping
8.	Kinetics of oxide growth is estimated by_____.
Option A:	Moore's Law
Option B:	Ficks Law
Option C:	Newton's Law
Option D:	Deal and grove
9.	_____is the process, where the material is sputtered or dissolved using reactive ions or a vapor phase etching.
Option A:	Wet Etching
Option B:	Dry Etching
Option C:	Wet Oxidation
Option D:	Dry Oxidation
10.	The Butting contact is used for connecting _____layers.
Option A:	metal and polysilicon
Option B:	metal and diffusion
Option C:	polysilicon and diffusion
Option D:	two metals
11.	For Negative resists, the exposed region becomes more _____.
Option A:	softened
Option B:	broken
Option C:	remains same
Option D:	hardened
12.	_____ is the process of transferring patterns of geometric shapes in a mask to a thin layer of radiation-sensitive material (called resist) covering the surface of a semiconductor wafer.
Option A:	Lithography
Option B:	Diffusion

Option C:	Ion Implantation
Option D:	Epitaxial growth
13.	In a simple p-well CMOS fabrication technology_____.
Option A:	The NMOS is created in the n type substrate
Option B:	The PMOS is created in the n type substrate
Option C:	Both NMOS and PMOS are created in the p type substrate
Option D:	Both NMOS and PMOS are created in the n type substrate
14.	When a new chip is designed and fabricated for the first time _____testing is done?
Option A:	verification
Option B:	manufacturing
Option C:	acceptance
Option D:	burn in
15.	Hall effect is observed in a specimen when it (metal or a semiconductor) is carrying current and is placed in a magnetic field. The resultant electric field inside the specimen will be in: _____.
Option A:	A direction normal to both current and magnetic field
Option B:	The direction reverse of current
Option C:	A direction parallel to magnetic field
Option D:	A direction parallel to current
16.	In testing process ATE refers to_____.
Option A:	Apparent Test Equipment
Option B:	Array Test Equipment
Option C:	Accurate Test Equipment
Option D:	Automatic Test Equipment
17.	To fabricate SOI device using Smart-Cut technology, which technique is used to cut the silicon wafer?
Option A:	Oxygen Implantation
Option B:	Hydrogen Implantation
Option C:	Nitrogen Implantation
Option D:	Ozone implantation
18.	A _____ is a field effect transistor semiconductor device with schottky junction instead of pn junction for a gate.
Option A:	MOSFET
Option B:	BJT
Option C:	MESFET
Option D:	BICMOS

19.	Carbon nanotubes are tubes made of carbon with diameters typically measured in _____.
Option A:	Millimeters
Option B:	Micrometers
Option C:	Centimeters
Option D:	Nanometers
20.	Multigate FET devices have better control over?
Option A:	drain Voltage
Option B:	Short Channel Effects
Option C:	Gate Current
Option D:	Long Channel Effects

Q2	Solve any Four out of Six	5 marks each
A	Write short notes on crystal defects.	
B	Mention the steps in standard RCA wafer cleaning process.	
C	Explain two steps in diffusion process.	
D	What are the different types of thin film deposition? Explain any one in brief.	
E	Write short notes on LOCOS.	
F	Mention the steps involved in the Photolithography process.	

Q3	Solve any Four out of Six	5 marks each
A	Draw different colour masks used in fabrication of CMOS inverter with N-well process.	
B	Explain Buried contact in brief with cross section/diagram.	
C	Explain Hot probe method.	
D	Enlist important parameters for which measurement is required before the device processing begins.	
E	Describe the smart cut method for fabrication of SOI.	
F	Write short notes on Multigate device structures.	

University of Mumbai
Examination 2021 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 15th June 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7034 and Course Name: Integrated Circuit Technology

Time: 2 hour Max. Marks: 80

==========

Q1:

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

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Color and size of the product, brand and packaging are considered as,
Option A:	Physical features of product
Option B:	Product designing
Option C:	Product manufacture
Option D:	Chemical features of product
2.	Which of the following is the last stage of Product Life Cycle?
Option A:	Introduction Stage
Option B:	Growth stage
Option C:	Decline stage
Option D:	Mature stage
3.	ISO 14042:2000 is related to:
Option A:	Principles & framework
Option B:	Life cycle inventory
Option C:	Life cycle impact assessment
Option D:	Life cycle interpretation
4.	Which of the following is the first step of product development process:
Option A:	Production ramp-up
Option B:	Identification of customer needs
Option C:	Prototyping
Option D:	Product design
5.	Function costing includes,
Option A:	breaking the product down into the functions.
Option B:	detection of activities that forms a PLC.
Option C:	estimating the cost of a product based on its features.
Option D:	Cost of overall product life cycle.
6.	Which of the following is not a characteristic of “Market Introduction Stage” in PLC?
Option A:	Demands has to be created
Option B:	Makes no money at this stage
Option C:	Slow sales volume to start
Option D:	Costs are low
7.	PDM stands for:
Option A:	Product Database Maintenance
Option B:	Price Data Management
Option C:	Product Data Management

Option D:	Production Data Management
8.	is a starting point of development of a PLM strategy.
Option A:	PLM vision
Option B:	PLM goals
Option C:	PLM objectives
Option D:	PLM mission
9.	An Algorithm is a type of:
Option A:	tangible goods
Option B:	services
Option C:	maintenance
Option D:	intangible goods
10.	Which of the following focuses on environmental resources & its proper use?
Option A:	Value analysis
Option B:	PLM objectives
Option C:	Sustainable development
Option D:	Life cycle cost analysis
11.	End of life strategies are used to:
Option A:	repairing of the product at the end of its life.
Option B:	recover the material at the end of its useful life.
Option C:	increase the life of the product by extending the end of the product
Option D:	maintenance of the product to increase its useful life.
12.	Which one of the following gives suggestions for new product and also helps to market new products?
Option A:	Existing products and services
Option B:	Federal government
Option C:	Distribution Channels
Option D:	Consumers
13.	The products enters maturity when,
Option A:	Decrease in profit
Option B:	Increase in sale
Option C:	Sales start growing
Option D:	Sales stop growing and demand stabilizes
14.	Which of the following involves, varying the physical properties of similar products & switching inter-changeable components?
Option A:	Value engineering
Option B:	Configuration management
Option C:	Product variant
Option D:	Change management
15.	PLM focuses on,
Option A:	value
Option B:	pricing
Option C:	product
Option D:	quality
16.	_____it is a method that tries to stimulate the way in which directly illuminated surfaces act as indirect light sources that illuminate other surfaces.

Option A:	Ray tracing
Option B:	Radiosity
Option C:	Digital mock up unit
Option D:	Ray casting
17.	Which of the following uses cross functional integration for concurrent development of a product?
Option A:	Concurrent engineering
Option B:	Value analysis
Option C:	Business analysis
Option D:	Value engineering
18.	Which of the following modeling refers to generate 3D features based on relationships with existing geometry?
Option A:	Parametric modeling
Option B:	Code driven modeling
Option C:	Surface modeling
Option D:	Direct modeling
19.	Compulsory stages of LCIA are:
Option A:	Selection, classification, characterization
Option B:	Scope & goal
Option C:	Functional unit, system boundaries
Option D:	data collection, allocation procedures
20.	Due to it is now possible to do business in all over countries in the world.
Option A:	globalisation
Option B:	liberalization
Option C:	commercialization
Option D:	standardization

Q2	**Solve any Four out of Six. (5 marks each)**
A	Write a note on Digital Mock-up Unit.
B	What are the various barriers to PDM implementation?
C	What are the important factors in sustainable development?
D	Explain general framework for LCCA?
E	Write a note on Design for Environment.
F	Explain PDM system.

Q3.	**Solve any Two Questions out of Three. (10 marks each)**
A	What is PLM? What are its benefits & applications?
B	Explain the process of developing & implementing a PLM strategy.
C	Explain the new product development in detail.

University of Mumbai

Examination 2021 under cluster ALL(Lead College: VCET)

Examinations Commencing from 15th June 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

==========

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

University of Mumbai

Examination 2021 under cluster ALL(Lead College: VCET)

Examinations Commencing from 15th June 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.	What is the failure cost of a product possessing reliability R=1?
Option A:	Zero
Option B:	Unity
Option C:	Infinity
Option D:	Negative
2.	Which among the below mentioned types of redundancy exhibits maximum failure rate?
Option A:	Cold standby
Option B:	Warm or Tepid
Option C:	Hot or Active
Option D:	Negative
3.	At a certain university, 4% of men are over 6 feet tall and 1% of women are over 6 feet tall. The total student population is divided in the ratio 3:2 in favour of women. If a student is selected at random from among all those over six feet tall, what is the probability that the student is a woman?
Option A:	2/5
Option B:	3/5
Option C:	3/11
Option D:	1/100
4.	The probability density function of a Markov process is .
Option A:	p(x1,x2,x3.....xn) = p(x1)p(x2/x1)p(x3/x2).....p(xn/xn-1)
Option B:	p(x1,x2,x3.....xn) = p(x1)p(x1/x2)p(x2/x3).....p(xn-1/xn)
Option C:	p(x1,x2,x3.....xn) = p(x1)p(x2)p(x3).....p(xn)
Option D:	p(x1,x2,x3.....xn) = p(x1)p(x2 *x1)p(x3*x2).....p(xn*xn-1)
5.	The operational availability is calculated as:
Option A:	$A_0 = \frac{Operating\ cycle}{uptime}$
Option B:	$A_0 = \frac{uptime}{operating\ cycle}$
Option C:	$A_0 = \frac{Operating\ cycle}{downtime}$
Option D:	$A_0 = \frac{downtime}{operating\ cycle}$

6.	It is suitable to use Binomial Distribution only for _____
Option A:	Large values of 'n'
Option B:	Fractional values of 'n'
Option C:	Small values of 'n'
Option D:	Any value of 'n'
7.	What is MTTF ?
Option A:	Maximum time to failure
Option B:	Mean time to failure
Option C:	Minimum time to failure
Option D:	Moderate Time to Failure
8.	Which one of the below is measured by MTBF?
Option A:	Tolerance
Option B:	Life time
Option C:	Reliability
Option D:	Quality
9.	Normal Distribution is applied for
Option A:	Continuous Random Distribution
Option B:	Discrete Random Variable
Option C:	Irregular Random Variable
Option D:	Uncertain Random Variable
10.	A go/no-go device is tested until it fail. If X is the number of tests to first failure with no wear our present, and the probability of success on each test is 0.99, then the probability that X is greater than 5 is:
Option A:	0.931
Option B:	0.941
Option C:	0.9510
Option D:	0.9610
11.	Inherent availability is the steady state availability when considering only
Option A:	the corrective maintenance of mean time of the system
Option B:	the corrective maintenance of median time of the system
Option C:	the correlative maintenance of mean time of the system
Option D:	the corrective maintenance of downtime of the system
12.	What is the area under a conditional Cumulative density function?
Option A:	Zero
Option B:	Infinity
Option C:	One
Option D:	Changes with CDF
13.	What will be the reliability of the system for a 100-hour mission, the system has three subsystems are reliability-wise in parallek, Subsystem 1 has a reliability of 99.5%, Subsystem 2 has a reliability of 98.7% and Subsystem31 has a reliability of 97.3%,
Option A:	0.96
Option B:	0.97

Option C:	0.98
Option D:	0.99
14.	According to exponential law of reliability, the relationship between the reliability and the system failure due to consistency in occurrence of failure rate, can be generally expressed as _____
Option A:	$R = \lambda t$
Option B:	$R = -\lambda t$
Option C:	$R = e\ \lambda t$
Option D:	$R = e- \lambda t$
15.	Failure rates in reliability analysis for the exponential case :
Option A:	Are multiplied together for independent events
Option B:	Increase to the mean value and then decrease
Option C:	Are summed to combine independent series elements in reliability analysis
Option D:	Are used to model the Weibull when $\beta = 2$
16.	which of the following is not the advantage of the restoration
Option A:	it reduces the cost of test equipment and downtime system
Option B:	it reduces the cost of system restoration
Option C:	it reduces space and size needed for keeping new systems
Option D:	it is possible even if the spare system is not available
17.	Which of the following can be considered as the worst feature of an aircraft in terms of maintainability?
Option A:	Requirements of removing number of major structural elements
Option B:	Easily reachable parts
Option C:	More accessibility is provided for components
Option D:	Easily accessible parts
18.	Markov analysis assumes that conditions are both
Option A:	Complementary and collectively exhaustive.
Option B:	Collectively dependent and complementary.
Option C:	Collectively dependent and mutually exclusive.
Option D:	Collectively exhaustive and mutually exclusive.
19.	Which method prevents the operating condition that exceeds beyond 50% of the maximum rating in order to improve the system reliability?
Option A:	Parts Improvement Method
Option B:	Structural Redundancy
Option C:	Effective & creative Design
Option D:	Derating of components
20.	What is the reliability of a four component parallel system when the reliabilities of each component are 0.70?
Option A:	0.9813
Option B:	0.9919
Option C:	0.1681
Option D:	0.9976

Q2	Solve any Four out of Six 5 marks each
A	Explain Mean Time to Failure and Mean Time Between Failure
B	What is series system? Obtain the system failure time density function for a series system with 'n' independent components. Suppose each of the n independent components has an exponential failure time distribution with constant failure rate λ_i, i= 1,2,3,…….,n. Find the System Reliability.
C	Define (i) Standardization(ii) Interchangeability
D	Explain Fault Tree Analysis with suitable example
E	Consider a system that has eight components and the system will work if at least any five of the eight components work (5-out-of-8 system). Each component has a reliability of 0.87 for a given period. Find the reliability of the system.
F	Describe in detail the qualitative aspects of Availability.

Q3	Solve any Two out of Three 10 marks each
A	What do you mean by Bays theorem in Probability? Derive Bays Theorem. And explain how Bays Theorem is different from Conditional Probability?
B	Discuss Importance of Reliability, Quality Assurance and Failure Density.
C	Explain Cut-Set method and Decomposition Method with Suitable Example

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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

==========

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

University of Mumbai

Examination 2021 under cluster 6 (Lead College: VCET)

Examinations Commencing from 15th June 2021

Program: **ALL**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO7013 and Course Name: Management Information System

Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Vital roles that the information systems does not perform for a business enterprise includes _____
Option A:	Support of business processes and applications
Option B:	Support of decision making by employees and managers
Option C:	Support for paper based accounting ledger
Option D:	Support of strategies for competitive advantage
2.	Possible response of the ethical challenges faced by Business managers to implement applications of Information Technology includes_____
Option A:	Implementation of information system solutions
Option B:	Infringement on piracy
Option C:	Inaccurate information
Option D:	Incentives
3.	External forces that affected by element of knowledge management includes _____
Option A:	Globalization of business
Option B:	Technology capability
Option C:	Effectiveness of human resource
Option D:	Disseminating knowledge
4.	Types of data warehouse does not include ___
Option A:	Enterprise data warehouse
Option B:	Data marts

Option C:	Data acquisition centre
Option D:	Operational data warehouse
5.	Identify the correct setup in a database environment
Option A:	User, database, DBMS
Option B:	User, DBMS, database
Option C:	Database, user, DBMS
Option D:	DBMS, database, user
6.	Metadata is the data that describes_____
Option A:	The collection and management of data
Option B:	The subset of the data warehouse
Option C:	The data in the warehouse
Option D:	Operations and shares among users
7.	The reverse auction is normally used in _____marketplace model
Option A:	Buy-side
Option B:	Sell-side
Option C:	Group purchasing
Option D:	Electronic exchange
8.	_____ is the intangible property created by individuals or corporations.
Option A:	Intellectual property
Option B:	Copyright
Option C:	Patent
Option D:	Trade secret

9.	Which is not a Fundamental Tenets of Ethics
Option A:	Responsibility
Option B:	Accountability
Option C:	Liability
Option D:	Digital dossiers
10.	Exposure is ____
Option A:	The harm, loss or damage that can result if a threat compromises an information resource
Option B:	Any danger to which a system/information resource may be exposed
Option C:	The procedures, devices, or software aimed at preventing a compromise to a system.
Option D:	The possibility that the system/information resource will suffer harm by a threat.
11.	Organization XYZ tries to attract customers by providing them with experiences tailored to them. What is this technique referred to?
Option A:	Inbound Marketing
Option B:	Outbound Marketing
Option C:	Search Engine
Option D:	Conversation
12.	_____ act as online intermediaries that harness the power of social networks for introducing, buying, and selling products and services.
Option A:	Group shopping sites
Option B:	Social marketplaces

Option C:	Shopping Communities
Option D:	Peer-to-peer shopping models
13.	Banner advertising _____.
Option A:	Is sent directly to potential customers via e-mail
Option B:	Forces customers to click on an ad to get more information.
Option C:	Is of limited value because it cannot be customized to the target audience.
Option D:	Is another name for pop-up advertising.
14.	All the following describe a VPN except:
Option A:	A VPN uses the Internet as its main backbone network.
Option B:	A VPN relies on network firewalls, encryption, and other Internet and intranet security features.
Option C:	A VPN uses the Internet to establish secure intranets between its distant offices and locations.
Option D:	A VPN is available for use by anyone with access to the Internet.
15.	Older, traditional mainframe-based business information systems are called _____ systems.
Option A:	Historical
Option B:	Standard
Option C:	Legacy
Option D:	Application
16.	A communications medium that consists of one or more central wires surrounded by thick insulation is called _____cable.
Option A:	Coaxial
Option B:	Fiber optic
Option C:	Twisted-pair
Option D:	Packet-transmission

17.	Data that have been processed by the organization's _____ are inputs into the organization's database.
Option A:	Office automation systems
Option B:	Functional area information systems
Option C:	Transaction processing systems
Option D:	Decision support systems
18.	Which of the following are disadvantages of the buy option for acquiring IS applications?
Option A:	The software exactly meet the company's needs.
Option B:	The software is easy to modify.
Option C:	The companies have control over software improvements.
Option D:	The software may not integrate with existing systems.
19.	Which of the following statements is false?
Option A:	Companies that use Software-as-a-Service are running applications on the vendor's hardware.
Option B:	Application service providers are similar to Software-as-a-Service providers.
Option C:	Companies that purchase open-source software cannot modify it.
Option D:	Outsourcing refers to acquiring IT applications from outside contractors.
20.	Place the stages of the systems development life cycle in order:
Option A:	Investigation – analysis – design – programming/testing – implementation – operation/maintenance
Option B:	Investigation – design – analysis – programming/testing – implementation – operation/maintenance
Option C:	Analysis – design – investigation – operation/maintenance – programming/testing – implementation
Option D:	Investigation – analysis – design – programming/testing – operation/maintenance – implementation

Q2 **(20 Marks)**	**Solve any Four out of Six 5 marks each**
A	Explain the elements and objectives of Information Systems with a neat diagram
B	Explain the role of information system in framing organizational strategy and bringing competitive advantage
C	Differentiate between knowledge and information and explain the significance of knowledge for a business firm
D	Define and explain the various types of data warehouse
E	Identify the five factors that contribute to the increasing vulnerability of information resources, and provide a specific example of each one?
F	Compare and contrast human mistakes and social engineering, and provide a specific example of each one?

Q3 **(20 Marks)**	**Solve any Four out of Six 5 marks each**
A	Briefly describe the benefits of social commerce to customers.
B	Discuss why social computing is so important in customer relationship management?
C	Differentiate computer network wired and wireless technology?
D	Describe how cloud computing can help organizations expand the scope of their business operations.
E	Explain various ERP implementation strategies
F	Describe the tools that augment the traditional SDLC.

University of Mumbai

Examination 2021 under cluster 6 (Lead College:VCET)

Examinations Commencing from 15th June 2021

Program: **ALL**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO7013 and Course Name: Management Information Systems

Time: 2 hour Max. Marks: 80

==========

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

University of Mumbai

Examination 2021 under cluster ALL(Lead College: VCET)

Examinations Commencing from 15th June 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7014 and Course Name: Design of Experiments

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 FALSE about strategy of experimentation called as best- guess approach _____.
Option A:	Guess dependent solution is produced
Option B:	May take long time
Option C:	Experimenters having knowledge are preferred
Option D:	Experimenters with good guessing power are preferred
2.	Consider the mathematical model y = f (x, z); $\Delta y = \frac{\partial f}{\partial x}\Delta x + \frac{\partial f}{\partial z}\Delta z$ Now determining the optimized x variability so that the variability of y is small is called _____.
Option A:	Process control
Option B:	Process optimization
Option C:	Robust design
Option D:	Process characterization
3.	The analysis procedure used for experimental data with uncontrollable and measurable nuisance factor is _____.
Option A:	Analysis of covariance
Option B:	Blocking
Option C:	Analysis of variance
Option D:	Analysis of average
4.	In the testing for Lack of Fit (LOF) the formula for sum of square for pure error is given by _____.
Option A:	$SS_{PE} = \sum_{i=1}^{m}\sum_{j=1}^{n}(\overline{y_{ij}} + \hat{y}_i)^2$
Option B:	$SS_{PE} = \sum_{i=1}^{m}\sum_{j=1}^{n}(\overline{y_{ij}} - \hat{y}_i)^2$

Option C:	$SS_{PE} = \frac{1}{2}\sum_{i=1}^{m}\sum_{j=1}^{n}(\overline{y_{ij}} - \hat{y}_i)^2$
Option D:	$SS_{PE} = \frac{1}{2}\sum_{i=1}^{m}\sum_{j=1}^{n}(\overline{y_{ij}} + \hat{y}_i)^2$
5.	Adding center points to a 2*k* factorial design allows the experimenter to obtain an estimate of pure experimental error. This allows the partitioning of the residual sum of squares *SSE* into two components. Which of the following is correct expression for *SSE ?*
Option A:	$SS_E = SS_{PE} + SS_{LOF}$
Option B:	$SS_E = SS_{PE} - SS_{LOF}$
Option C:	$SS_E = SS_{PE} * SS_{LOF} /(SS_{PE} + SS_{LOF})$
Option D:	$SS_E = SS_{PE} * SS_{LOF} / /(SS_{PE} - SS_{LOF})$
6.	A 2 X 2 factorial _____.
Option A:	is essentially two designs that have been combined into a single study.
Option B:	contains four factors.
Option C:	does not have enough factors to show interactions.
Option D:	is extremely difficult to interpret if interactions are found.
7.	What is the appropriate statistical test for a factorial design?
Option A:	the Modes test
Option B:	ANOVA
Option C:	t-test
Option D:	chi-square
8.	Each main plot is divided into subplots depending on the number of _____.
Option A:	Sub plot treatments
Option B:	Pre plot treatments
Option C:	Post plot treatments
Option D:	Modified plot treatments
9.	In field experiments certain factors may require plots than for others.
Option A:	Lesser
Option B:	Same
Option C:	Larger
Option D:	Small

10.	Factorial designs _____.
Option A:	include no more than one research hypothesis.
Option B:	cannot test participants across more than one condition.
Option C:	contain more than one null hypothesis.
Option D:	are ineffective when matched participants are included.
11.	What type of control chart can be used to plot "number of defectives in the output of a process for making a machine part"data?
Option A:	C
Option B:	U
Option C:	S
Option D:	P
12.	The design in which no main effect is aliased with any other main effect, or with any two-factor interaction, but two-factor interactions are aliased with each other are called .
Option A:	Resolution VI design
Option B:	Resolution V design
Option C:	Resolution IV design
Option D:	Resolution III design
13.	Which of the following would be a useful contributor to a strategy of mass customization?
Option A:	Economics of scale
Option B:	Modular Design
Option C:	Offshoring
Option D:	Fixed Automation
14.	Which of the following is true?
Option A:	Having more than one dependent variable allows the examination of interactions between them.
Option B:	There must be the same number of independent variables as there are dependent variables.
Option C:	An experiment can have more than one dependent variable.
Option D:	An experiment can only have one dependent variable.
15.	Small differences in results from trial to trial can happen in case of .
Option A:	good data sets
Option B:	bad data sets
Option C:	sample data sets
Option D:	attribute data sets
16.	Which of the followings is true about sample size?
Option A:	the sample size should be as small as possible
Option B:	the sample size can be random
Option C:	the sample size is insignificant
Option D:	depends upon the quality characteristic under evaluation i.e. Variable or attribute

17.	Which of the following is an example of attribute data?
Option A:	volume
Option B:	switch on & switch off
Option C:	Temperature
Option D:	pressure
18.	A method for quantitatively identifying the right inputs and parameter levels for making a high quality product or service is called as -
Option A:	regression analysis
Option B:	design of experiments
Option C:	random factor design
Option D:	split plot design
19.	2^3 indicates how many levels?
Option A:	2
Option B:	3
Option C:	4
Option D:	8
20.	Larger the better S/N ratio is chosen in case of -
Option A:	undesirable characteristics
Option B:	bad characteristics
Option C:	desirable characteristics
Option D:	good characteristics

Q2. **(20 Marks)**	**Solve any Four out of Six** **5 marks each**
A	What are Experimental Designs? Give its applications.
B	What are guidelines for designing experiments?
C	Write short note on S/N ratios.
D	What are Good and Bad datasets?
E	What is RMS?
F	Explain Construction of Normal Probability Plot.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	What do you understand from the term 2^k design? Explain with an example.
B	Discuss testing for lack of fit
C	What are statistical aspects of conducting tests?

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ILO 7014 and Course Name: Design of Experiments

Time: 2 hour Max. Marks: 80

==========

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

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 2021

Program: **ALL**

Curriculum Scheme: R2016

Examination: BE Semester VII

Course Code: ILO7015 and Course Name: Operations Research

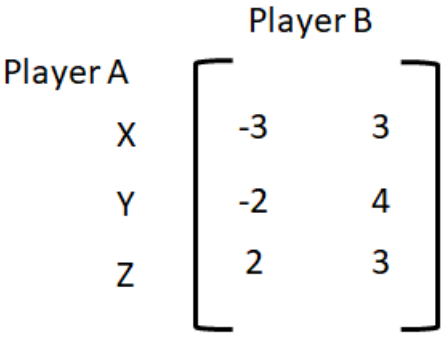
Time: 2 hour Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which of the following assumptions of Linear Programming is not obeyed in Integer Linear Programming?
Option A:	Lineraity
Option B:	Continuity
Option C:	Additivity
Option D:	Finiteness
2.	Consider the LP problem Maximise $Z = x_1 - 3x_2 + 3x_3$ Subject to, $3x_1 - x_2 + 2x_3 \leq 7$ $2x_1 + 4x_2 \geq -12$ $-4x_1 + 3x_2 + 8x_3 \leq 10$ Where $x_1, x_2, x_3 \geq 0$ In the simplex algorithm, the variables that enters first is ___ and this variable replaces variable ____
Option A:	x_1, s_1
Option B:	x_2, s_3
Option C:	x_3, s_2
Option D:	x_1, s_2
3.	Which statement holds true for the given LP problem : Maximise $Z = 3x_1 + 5x_2$ Subject to, $2x_1 + x_2 \geq 7$ $x_1 + x_2 \geq 6$ $x_1 + 3x_2 \geq 9$ Where $x_1, x_2 \geq 0$
Option A:	This LP has no solution
Option B:	This LP has redundant constraints
Option C:	This LP has multiple solutions.
Option D:	This LP has an unbounded solution
4.	If two jobs J1 and J2 have same minimum process time under first machine but processing time of J1 is less than that of J2 under second machine, then J1 occupies:

Option A:	Second available place from left
Option B:	First available place from the left
Option C:	First available place from right
Option D:	Second available place from right
5.	To solve degeneracy in the transportation problem we have to:
Option A:	Allocate the smallest element epsilon in such a cell, which will form a closed loop with other loaded cells.
Option B:	Allocate the smallest element epsilon in such a cell, which will not form a closed loop with other loaded cells.
Option C:	Put allocation in one of the empty cell as zero
Option D:	Put a small element epsilon in any one of the empty cell
6.	Consider the following six jobs J1,J2,J3,J4,J5,J6 to be processed on two machines A and B in the order A,B . The processing times on machine A are [1,3,8,5,6,3] and on machine B are [5,6,3,2,2,10]. The optimal sequence is :
Option A:	J1-J2-J3-J4-J5-J6
Option B:	J1-J2-J6-J3-J5-J4
Option C:	J1-J2-J4-J5-J6-J4
Option D:	J1-J2-J3-J6-J5-J4
7.	How many routes are possible if travelling salesman travels six cities?
Option A:	10
Option B:	5
Option C:	24
Option D:	120
8.	In a departmental store, one cashier is there to serve the customers and the customers pick up their needs by themselves. The arrival rate is 7 customers for every 5 minutes and the cashier can serve 10 customers in 5 minutes. Assuming Poisson arrival rate and exponential distribution for service rate, the average number of customers in the system are---
Option A:	1.4
Option B:	0.5
Option C:	0.714
Option D:	2
9.	The characteristics of a queuing model is independent of:
Option A:	Service Pattern
Option B:	Number of service stations
Option C:	Queue discipline
Option D:	Limit of length of queue
10.	For a simple queue (M / M / 1), Probability that a person arriving will have to wait is known as ---
Option A:	Random factor
Option B:	Traffic intensity
Option C:	Poisson busy period
Option D:	Exponential service factor

11.	If the outcome at any decision stage is unique and known for the problem, then the Dynamic programming problem is known as:
Option A:	Static dynamic programming problem
Option B:	Deterministic dynamic programming problem
Option C:	Probabilistic dynamic programming problem
Option D:	Stochastic dynamic programming problem
12.	In Dynamic Programming Problems, the decisions are made in
Option A:	Single stage
Option B:	No decision making process
Option C:	2-stages
Option D:	Multi-stages
13.	If there are 'n' stages, and recursive equations for each stage is f1, f2 ……fn and if they are solved in the order f1 to fn and optimal return for f1 is r1 and that of f2 is r2 and so on, then the method of calculation is known as –
Option A:	Direct Computational Procedure
Option B:	Forward computational procedure
Option C:	Reverse Computational Procedure
Option D:	Backward Computational Procedure
14.	Dynamic Programming is also called as :
Option A:	Multistage problem
Option B:	Structural programming
Option C:	State problems
Option D:	Recursive optimization
15.	The value of the following game G is— $\begin{bmatrix} 1 & 13 & 11 \\ -9 & 5 & -11 \\ 0 & -3 & 13 \end{bmatrix}$
Option A:	0
Option B:	-1
Option C:	+1
Option D:	+11
16.	One of the assumption in the game theory is—
Option A:	Winner alone acts rationally
Option B:	All players act rationally and intelligently
Option C:	Loser acts intelligently
Option D:	Both the players believe luck
17.	Which statement holds true for the given game:

	
Option A:	Game is fair
Option B:	Game is strictly Determinable
Option C:	Saddle point is (1,3)
Option D:	No saddle point exists
18.	Setup costs do not include :
Option A:	Cost of processing the work piece
Option B:	Ordering cost of raw material
Option C:	Maintenance cost of the machines
Option D:	Labour cost of setting up machines
19.	The demand for a commodity is 100 units per day. Every time an order is placed, a fixed cost of Rs. 300 is incurred. Holding cost is Rs. 0.06/- per unit per day. If the lead time is 13 days, then economic lot size is:
Option A:	300
Option B:	1000
Option C:	1200
Option D:	100
20.	A particular item has demand of 3000 units per year. The cost of one procurement is Rs. 100 and the holding cost per unit is Rs. 2.40 per year. The replacement is instantaneous and no shortages are allowed. What will be the total cost in per year if the cost of one unit is Rs. 1?
Option A:	4200
Option B:	3500
Option C:	3120
Option D:	3849

Q2	**Solve any four** **5 marks each**
A.	A branch of Canara Bank has only one typist. Since the typing work varies in length (number of pages to be typed), the typing rate is randomly distributed approximating a Poisson distribution with mean service rate of 8 letters per hour. The letters arrive at a rate of 5 per hour during the entire 8-hour work day. If the typewriter is valued at Rs. 1.50 per hour, determine—Equipment utilization, average cost due to waiting on the part of typewriter i.e it remaining idle.

B. A company manufactures around 200 mopeds. Depending upon the availability of raw materials and other conditions, the daily production has been varying from 196 to 204 mopeds, whose probability distribution is as given below:

Production/day	196	197	198	199	200	201	202	203	204
Probability	0.05	0.09	0.12	0.14	0.20	0.15	0.11	0.08	0.06

The finished mopeds are transported in a specifically designed three-storeyed lorry that can accommodate only 200 mopeds. Using the following 15 random numbers 82,89,78,24,53,61,18,45,04,23,50,77,27,54 and 10, simulate the process to find out what will be the average number of mopeds waiting in the factory?

C. A firm has divided its marketing area into three zones. The amount of sales depends upon the number of salesman in each zone. The firm has been collecting the data regarding sales and salesman in each area over a number of past years. The information is given as below.

No. of Salesman	Zone 1	Zone 2	Zone 3
0	30	35	42
1	45	45	54
2	60	52	60
3	70	64	70
4	79	72	82
5	90	82	95
6	98	93	102
7	105	98	110
8	100	100	110
9	90	100	110

For the next year firm has only 9 salesman and the problem is to allocate these salesman to three different zones so that the total sales are maximum.

D.	An aircraft company uses rivets at an approximate customer rate of 2,500kg per year. Each unit costs Rs. 30 per kg and the company personnel estimate that it costs Rs. 130 to place an order, and that the carrying cost of inventory is 10 percent per year. How frequently should orders for rivets be placed? Also, determine the optimum size of each order.
E.	A and B play a game in which each has three coins a 5p, a 10p and a20p. Each player selects a coin without the knowledge of the other's choice. If the sum of the coins is an odd amount, A wins B's coin; if the sum is even, B wins A's coin. Find the best strategy for each player and the value of the game.
F.	Write the dual of the LPP: Maximise $Z = 30x_1 + 23x_2 + 20x_3$ Subject to, $6x_1 + 5x_2 + 3x_3 \leq 26$ $4x_1 + 2x_2 + 5x_3 \leq 7$ Where $x_1, x_2, x_3 \geq 0$

Q3	**Solve any Two** **10 marks each**
A.	Solve the following LPP: Maximise $Z = 4x_1 + x_2 + 3x_3 + 5x_4$ Subject to, $4x_1 - 6x_2 - 5x_3 - 4x_4 \geq -20$ $-3x_1 - 2x_2 + 4x_3 + x_4 \leq 10$ $-8x_1 - 3x_2 + 3x_3 + 2x_4 \leq 20$ Where $x_1, x_2, x_3, x_4 \geq 0$
B.	Four jobs 1, 2, 3 and 4 are to be processed on each of the five machines A, B, C,D and E in the order ABCDE. Find the total minimum elapsed time if no passing of jobs is permitted and determine idle time for each machine.

Job	Machine A	Machine B	Machine C	Machine D	Machine E
1	7	5	2	3	9
2	6	6	4	5	10
3	5	4	5	6	8
4	8	3	3	2	6

C

Find initial basic feasible solution by VAM and optimal solution by MODI method:

	Warehouse A	Warehouse B	Warehouse C	Availability
Factory F1	8	7	3	60
Factory F2	3	8	9	70
Factory F3	11	3	5	80
Demand	50	80	80	

University of Mumbai

Examination 2021 under clusterALL (Lead College: VCET)

Examinations Commencing from 15th June 2021

Program: **ALL**

Curriculum Scheme: R2016

Examination: BESemester VII

Course Code: ILO7015 and Course Name: Operations Research

Time: 2 hour Max. Marks: 80

==========

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

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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 hours Max. Marks: 80

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which is not an element of information security ?
Option A:	Confidentiality
Option B:	Integrity
Option C:	Authentication
Option D:	Standardization
2.	Cyber -vandalism is
Option A:	Using cyber-technology in unauthorized ways to reproduce copies of propriety software and proprietary information
Option B:	To distribute proprietary information across a network
Option C:	Using cyber-technology to gain unauthorized access to an individual's or organization's computer system.
Option D:	Using cyber-technology to unleash one or more programs that disrupt the transmission of electronic information across one or more computer networks, including the Internet.
3.	Which of the following is a non-violent cybercrime ?
Option A:	Internet gambling
Option B:	Cyberstalking
Option C:	Piracy
Option D:	Identity theft
4.	By Salami Attack virus we mean:
Option A:	Trapdoors persist
Option B:	Control viruses
Option C:	A small amount of money is shaved from each computation
Option D:	Poor error checking
5.	For attacking the database of a system / website which method is used by the criminals.
Option A:	HTML injection
Option B:	SQL Injection
Option C:	Malicious code injection

Option D:	XML Injection
6.	If you are contacted via telephone by someone posing to represent a financial institution you do business with and are asked to provide or update personal or account information, you should:
Option A:	Give all your confidential and personal data to them
Option B:	Ask to speak to a senior supervisor
Option C:	Hang up!
Option D:	Hang up and find the phone number of that institution in one of your account statements, credit cards or their verifiable website address and call that number to check on the request.
7.	If a user's session is compromised by another person with the intention of either misuse of the user's credentials without his/her knowledge or exploiting the user's data and perform malicious activities is called _____
Option A:	Social engineering
Option B:	Session hijacking
Option C:	Cookie stuffing
Option D:	Baiting
8.	The first step in hacking is _____
Option A:	Remote attack
Option B:	Port scanning
Option C:	Reconnaissance
Option D:	Clear logs
9.	_____ is a technique of hiding confidential information inside a picture?
Option A:	Image processing
Option B:	Stenography
Option C:	Key loggers
Option D:	DoS attack
10.	The purpose of a Denial of Service attack is _____.
Option A:	To overload a system so that it is no longer operational
Option B:	To shutdown services by turning them off
Option C:	To crack the password of a system
Option D:	To assess the vulnerabilities
11.	Comparing the value of the canary with the original value, can help one identify if a _____ has occurred.
Option A:	DDoS
Option B:	Nuking
Option C:	Buffer overflow
Option D:	Block cipher
12.	This type of contract is used for online services like creating a new e-mail account. This contract is known as
Option A:	Shrink wrap contract

Option B:	Click wrap contract
Option C:	Browse wrap contract
Option D:	Void contract
13.	Digital Signature Certificate is _____ requirement under various applications
Option A:	Statutory
Option B:	Legislative
Option C:	Governmental
Option D:	Voluntary
14.	Which of the following cannot be exploited by assigning or by licensing the rights of others.
Option A:	Patent
Option B:	Design
Option C:	Trademark
Option D:	Copyright
15.	Which is the Act which provides legal framework for e-Governance in India
Option A:	IT (amendment) Act 2008
Option B:	Indian Penal Code
Option C:	IT Act 2000
Option D:	Indian Evidence Act, 1872
16.	Which following Act was not amended in Information Technology Act 2000 ?
Option A:	The Bankers Books Evidence Act, 1891
Option B:	BSNL IT Policy
Option C:	RBI Act 1934.
Option D:	The Indian Evidence Act, 1872
17.	The punishment for hacking of computers under ITAA 2008?
Option A:	Fine up to ten lakhs or imprisonment up to three years or both
Option B:	Fine up to five lakhs or imprisonment up to three years or both
Option C:	Fine up to five lakhs or imprisonment up to five years or both
Option D:	Fine up to ten lakhs or imprisonment up to five years or both
18.	Companies are required to disclose on an almost real time basis he information concerning material changes in its financial conditions or operations. Which is this key provision?
Option A:	SOX section 302
Option B:	SOX section 404
Option C:	SOX section 409
Option D:	SOX section 806
19.	_____ is a type of program that is installed with or without your permission or knowledge on your personal computer to collect information about users. It tracks every activity of the user including their browsing habits and sends them to a remote user.

Option A:	Adware
Option B:	Spyware
Option C:	Virus
Option D:	Worm
20.	To protect mobile phones from viruses , one should not
Option A:	Update system and application software
Option B:	Disable Bluetooth, infrared or Wi-Fi when they are not in use
Option C:	Be cautious while opening e-mail and text message attachments and clicking links
Option D:	Join unknown public Wi-Fi networks

Q.2	
A	**Solve any Two** **5 marks each**
i.	Explain cyber defamation.
ii.	Write a note on classification of cybercrime.
iii.	Differentiate between virus and worms.
B	**Solve any One** **10 marks each**
i.	Is your data safe on cloud ? Justify your answer.
ii.	Explain SQL injection attack? State different countermeasures to prevent the attack.
Q.3	
A	**Solve any Two** **5 marks each**
i.	What is intellectual property? What are the different types of intellectual property ?
ii.	Mention the key IT requirements of FISMA.
iii.	Identify the type of E-commerce category for the following websites : A) www.bigbasket.com B) www. IndiaMART.com C) www.Olx.in D) www.Freelancer.com E) https://indianvisaonline.gov.in
B	**Solve any One** **10 marks each**
i.	The way banking operations are conducted has changed tremendously with the development of technology. Explain this statement by discussing various electronic banking services provided by the banks in India.
ii.	What is the Indian Information Technology Act,2000? Explain it's objectives and features?

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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

==========

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

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 2021

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

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Hazards can be prioritized by:
Option A:	Manageability, Urgency, Growth, Seriousness
Option B:	Urgency, Manageability, Seriousness, Growth
Option C:	Growth, Manageability, Urgency, Seriousness
Option D:	Seriousness, Manageability, Urgency, Growth
2.	_____ can be defined as threat to life, health, property, and environment.
Option A:	Hazards
Option B:	Vulnerability
Option C:	Disaster
Option D:	Risk
3.	Urbanization usually results in an increase in flood frequency because :
Option A:	Less water can runoff in streams
Option B:	Less water can infiltrate into the ground, so instead is discharged rapidly into streams
Option C:	More water is used by humans and then discharged to streams
Option D:	Rainfall is greater in urban areas than in rural areas
4.	The cycle of disaster consists of the following components:
Option A:	Mitigation, Preparedness, Response, Recovery
Option B:	Preparedness, vulnerability assessment, risk assessment, recovery
Option C:	Mitigation, Risk assessment, Response and Recovery
Option D:	Mitigation, vulnerability assessment,Response and Recovery
5.	Which of the following is not part of geological disaster?
Option A:	Volcanoes
Option B:	Earthquake
Option C:	Tsunami
Option D:	Sea surge
6.	Pandemic disease is defined as:

Option A:	Outbreak of a disease in international scale
Option B:	Outbreak of a disease beyond the area of a disease
Option C:	Congestion in urban areas.
Option D:	Outbreak of a disease in local area
7.	The primary goal of a disaster preparedness plan is:
Option A:	To protect the population
Option B:	To protect valuable resources
Option C:	To keep communications lines open
Option D:	To protect environmental health personnel
8.	Which of the following is not the causes of manmade disaster?
Option A:	Technological
Option B:	Transportation
Option C:	Landslides
Option D:	Production errors
9.	Which of the following coordinate the research activities in different aspects of management at national level?
Option A:	CDM
Option B:	National center for disaster management
Option C:	NICEE
Option D:	Disaster management institute
10.	Various types of funds have been created under which legal frame work
Option A:	Disaster Management Act 2005
Option B:	Disaster Management Act 2006
Option C:	Disaster Management Act 2002
Option D:	National Plan 2008
11.	Which of the following organizations is the apex authority of disaster management in India?
Option A:	NDA
Option B:	NDMA
Option C:	CDMA
Option D:	INDR
12.	The Richter scale expresses an earthquake
Option A:	Magnitude
Option B:	Location
Option C:	Duration
Option D:	Depth
13.	The technique of acquisition of information about an object or phenomenon without being physical contact with the object.
Option A:	Data acquisition
Option B:	Remote Sensing

Option C:	Management system
Option D:	Image processing
14.	What is called for the manuals that identify the role of each officer in State for managing the natural disasters?
Option A:	State Relief Manuals
Option B:	State Environmental Protection Manuals
Option C:	State Disaster Manuals
Option D:	State Protection Manuals
15.	An extreme natural phenomenon capable of causing disaster leading to loss of lives or damage to property is known as-
Option A:	Natural hazard
Option B:	Hazard calculation
Option C:	Desertification
Option D:	Risk
16.	Which of the following sentence about insurance is not true?
Option A:	Insurance guarantees fixed compensation amount prior
Option B:	Insurance market of India is in developed stage, there is no limitations on the cover under insurance for natural disaster.
Option C:	Insurance is limited to major industrial and commercial properties.
Option D:	Role of insurance agencies in disaster management needs to be given more importance.
17.	The National Disaster Management Authority (NDMA) is headed by:
Option A:	Prime Minister of India
Option B:	President of India
Option C:	Governor of States
Option D:	Chief Minister of States
18.	International Tsunami information Center is located in
Option A:	Honolulu
Option B:	Goa
Option C:	Jakarta
Option D:	Puducherry
19.	What is the main role of Government Agencies in Disaster Relief Funding
Option A:	The financial assistance to meet the rescue & relief expenditure during any disaster
Option B:	To build houses in different disasters
Option C:	To advice state government how to manage various disasters
Option D:	To act as common platform for Central & State Government
20.	Who is the Chairperson of NEC, National Executive Committee?
Option A:	Home Secretary
Option B:	Finance Secretary
Option C:	Home Minister
Option D:	Finance Minister

Q2.	**Solve any Four out of Six 5 marks each**
A	Write a short note on direct and indirect effects of disaster.
B	Describe any 4-natural disaster in brief.
C	Explain objectives of disaster management policy.
D	Write a short note on DM act.
E	Write a short note on role of media in effective disaster management.
F	Explain Community base disaster preparedness.

Q3.	**Solve any Four out of Six 5 marks each**
A	Define hazards and also brief about modes and causes of hazards.
B	Explain the role of growing population in frequent occurrences of manmade disasters.
C	Draw and explain phases of Disaster Management cycle.
D	Write a short note on advantages of GIS and any one application of GIS in disaster management.
E	Write a short note on various activities conducted by SDMA.
F	Explain in detail pre- disaster and post disaster measures.

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 2021

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

==========

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

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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

==========

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Choose an incorrect form of natural gas as energy source.
Option A:	Nitrogen
Option B:	LPG
Option C:	LNG
Option D:	CNG
2.	Which of the following power generation type have very least share in India's total installed capacity? (Ref. year Feb2014)
Option A:	Thermal
Option B:	Hydro-electric
Option C:	Nuclear
Option D:	Renewable
3.	In which sector the energy consumption is highest in India?
Option A:	Agriculture
Option B:	Transport
Option C:	Residential
Option D:	Industry
4.	The energy management aims at producing goods and provide services with
Option A:	only the least environmental effect
Option B:	Only the least cost
Option C:	least cost and least environmental effect
Option D:	either least cost or least environmental effect
5.	The type of Energy Audit to be performed depends on:
Option A:	Cost of energy
Option B:	Depth to which final audit is needed
Option C:	The type of Fuel used in Industries
Option D:	Manpower in an Industry
6.	Understanding energy cost is important factor for :
Option A:	Improving system Efficiency
Option B:	Awareness creation and Saving calculation
Option C:	For manpower calculation

Option D:	For material procurement
7.	Penalties were imposed in HT Electricity bills before 1st April 2020 due to:
Option A:	Crossing Maximum Demand
Option B:	Not maintaining Power Factor above specified value
Option C:	Both for crossing maximum demand and non-maintaining power factor above specified value
Option D:	Not maintaining the duration of Electricity use
8.	Plant energy performance (PEP) is the measure of:
Option A:	Material getting used in an Industry
Option B:	Manpower utilization in an Industry
Option C:	How well the energy management programme is doing
Option D:	Utilization of resources available
9.	A utility bill shows an average pf of 0.72 with average KW of 627.How much KVAr is required to improve pf to 0.95
Option A:	425KVAr
Option B:	336 KVAr
Option C:	398 KVAr
Option D:	192 KVAr
10.	Capacitors with automatic power factor controller when installed in a plant:
Option A:	Reduces the voltage of the plant
Option B:	Reduces the reactive power drawn from grid
Option C:	Reduces active power drawn from grid
Option D:	Increases the load current of the plant
11.	The following function **cannot** be achieved with automatic power factor controllers.
Option A:	KVAr control
Option B:	kW control
Option C:	PF control
Option D:	Voltage control
12.	The material used for core of Energy efficient transformer is
Option A:	Cold Rolled Gain Oriented Steel
Option B:	Silicon alloyed iron(grain oriented)
Option C:	Copper
Option D:	Amorphous core - metallic glass alloy
13.	The characteristic of conventional ballast in lighting application is one among the following:
Option A:	They have low operational losses than electronic ballasts
Option B:	They do not require a mechanical switch (starter)
Option C:	They have tuned circuit to deliver power at very high frequency
Option D:	They have high operational losses and high temperature rise
14.	Following is NOT the property of Soft starter
Option A:	less Mechanical stress
Option B:	Improved Power factor

Option C:	Lower maximum demand
Option D:	High Mechanical stress
15.	Length of interior, Width of interior and the mounting height are required to calculate..
Option A:	Lux level
Option B:	Colour Rendering Index
Option C:	Power in watts
Option D:	Room Index
16.	Which of the following lamps has the maximum lamp efficiency in lumens/Watt?
Option A:	Metal Hallide
Option B:	HPSV
Option C:	Incandescent
Option D:	Fluorescent
17.	Slip method for measurement of motor loading has disadvantage of
Option A:	High cost
Option B:	Large time required
Option C:	Less accuracy
Option D:	More calculations
18.	Which of the following produces energy because of temperature difference at various levels in ocean
Option A:	Tidal energy
Option B:	Wave energy
Option C:	Solar energy
Option D:	Ocean thermal energy
19.	What percentage of the sun's energy falling on a silicon solar panel gets converted into electricity?
Option A:	Around 35
Option B:	Around 15
Option C:	Around 75
Option D:	Around 50
20.	Identify the type of steam if it floats out intermittently in a whitish cloud
Option A:	Leaking steam
Option B:	Flash steam
Option C:	Cloud steam
Option D:	Superheated Steam

Q2	
A	**Solve any Two** **5 marks each**
i.	Explain any five features of Energy Conservation Act 2001
ii.	Define monitoring and targeting. Explains elements of M & T system.
iii.	Explain demand charges and TOD tariff.
B	**Solve any One** **10 marks each**

<table>
<tr><td>i.</td><td>Explain general fuel economy measures in boilers.</td></tr>
<tr><td>ii.</td><td>A 415 V, 20kW, 3-ph, 50Hz Induction motor operates at full load, with 86% efficiency and 0.85 power factor lagging:
a) Find the current drawn by the motor
b) If this motor is replaced by 92% energy efficient motor of same capacity with 0.88 power factor, what will be the power savings in terms of kW. If annual working hours of that motor are 7000 and rate of electricity is Rs.10 per Kwh, find annual energy saving.</td></tr>
<tr><td>Q3</td><td></td></tr>
<tr><td>A</td><td>Solve any Two 5 marks each</td></tr>
<tr><td>i.</td><td>List any Five Energy Conservation opportunities in lighting system</td></tr>
<tr><td>ii.</td><td>Explain step by step approach of electrical load management.</td></tr>
<tr><td>iii.</td><td>What are the advantages of green buildings and state 3 examples of green buildings in India?</td></tr>
<tr><td>B</td><td>Solve any One 10 marks each</td></tr>
<tr><td>i.</td><td>Explain energy saving opportunities in steam distribution systems.</td></tr>
<tr><td>ii.</td><td>Find ILER for the industrial illumination system where colour rendering in not essential. Average lux level measured 500lux. Room dimensions 9m*4m*4m. Fixtures are suspended from ceiling at 0.5m. Height of work plane is 0.8m. There are 10 tube lights of 52W each in the room. Suggest the measure if required and find annual wastage if any, If lamps are used for 8 hours a day and 300 days in a year. The room index and associate target lux/W/m^2 for the mentioned system is as follows
<table>
<tr><td>Room Index</td><td>Target lux/W/m^2</td></tr>
<tr><td>1</td><td>52</td></tr>
<tr><td>1.25</td><td>55</td></tr>
<tr><td>1.5</td><td>58</td></tr>
<tr><td>2</td><td>61</td></tr>
<tr><td>2.5</td><td>64</td></tr>
<tr><td>3</td><td>65</td></tr>
<tr><td>4</td><td>66</td></tr>
<tr><td>5</td><td>67</td></tr>
</table></td></tr>
</table>

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 701**8** and Course Name: EAM

Time: 2 hour Max. Marks: 80

==========

=

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

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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

==========

==========

=

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Why did Gandhiji advocate decentralization
Option A:	It weakens the state
Option B:	It brings power to the people
Option C:	It is an alternative to Parliamentary democracy
Option D:	All of the above
2.	Which constitutional amendments give recognition and protection to local government
Option A:	64th and 65th
Option B:	73rd and 74th
Option C:	69th and 70th
Option D:	83rd and 84th
3.	Social ethics
Option A:	Defines behaviour of people in society
Option B:	Examines ethics in business environment
Option C:	Are moral principles that guide religion
Option D:	Based on individual's belief of right and wrong
4.	Development Engineering encompasses the following fields
Option A:	Economics
Option B:	Social sciences
Option C:	Engineering
Option D:	All of the above
5.	The term Panchayati Raj signifies (1) urban local self government,(2) rural local self government. Which of the following is true
Option A:	1 only
Option B:	2 only
Option C:	both
Option D:	none
6.	Infant mortality

Option A:	is defined as the annual number of deaths of infant under 1 year old per 1,000 live births.
Option B:	reflects the availability of primary education, the rights of employment and social security.
Option C:	is life expectancy up to age 3.
Option D:	reflects the availability of hospitals and childcare facilities, and the parents' wealth.
7.	Which is not a terminology associated with Development Engineering
Option A:	Engineering for Design
Option B:	Engineering for change
Option C:	Humanitarian engineering
Option D:	Engineering for impact
8.	Consider the following statements regarding Human Development Index (HDI): I. The Human Development Index (HDI) is a composite index that measures the average achievements in a country in three basic dimensions of human development. II. The basic dimensions are a long and healthy life, knowledge and a decent standard of living. Which of the following statement(s) is/are correct?
Option A:	Only I
Option B:	Only II
Option C:	Both I, II
Option D:	Neither I,II
9.	To which type of engineers can code of ethics conceived by professional engineering societies be of any use
Option A:	Engineers who are licensed professionals
Option B:	Engineers who belong to professional engineering societies
Option C:	Engineers who are working in Public Sector Enterprise
Option D:	All those people who engage in engineering practice
10.	Which of the following statements is correct regarding 73rd amendment (1) Added eleventh schedule to the constitution (2) Added a new part-IX to the constitution of India, entitled as the Panchayats (3) Gives constitutional status to the PRI (4) Significant landmark in the evolution of grass root democratic institutions in the country
Option A:	1,2,3
Option B:	1,2.4
Option C:	2,3,4
Option D:	1,2,3,4
11.	What are the possible ethical dilemma that a whistleblower can face (1) Public interest vs. private interest (2) Citizenship vs. employment(3) Private benefit vs. employers benefit(4) Short term view vs. Long term view
Option A:	1,2,4
Option B:	1,3,4
Option C:	1,2,3
Option D:	1,4

12.	Which of the following criteria for judging whether proposed research involving human subjects is ethically sound?(1) Risk to subject are minimized (2)Risks are reasonable compared to anticipated benefits (3) Prior informed consent will be obtained from subjects (4) Subjects privacy and confidentiality will be maintained. Which of the following is correct?
Option A:	1,2
Option B:	1,3,4
Option C:	1,2,3,4
Option D:	1,3
13.	Which of the following statements are true about values (1) People are always aware of their values (2) Values are the links between needs and action,(3)Moral values are the most fundamental form of values (4) Values are the basis of emotions
Option A:	1,2,3
Option B:	2,3,4
Option C:	1,2,3,4
Option D:	2,4
14.	Panchayati Raj in India was first introduced in 1959 in which state
Option A:	Rajasthan
Option B:	Kerala
Option C:	Tamil Nadu
Option D:	West Bengal
15.	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
16.	Which of the following statements is the most correct description of the relationship between humans and technology
Option A:	Technology impacts upon human action and human beings
Option B:	Human beings" act on, use, make" technology
Option C:	Technology provides apparatus for human action
Option D:	Technology hijacks human autonomy
17.	(1) In Panchayat seats are reserved for SC, ST and women but not for backward classes of citizens (2) Not less than 1/3 of the seats are reserved for women including number of seat reserved for women of SC and ST. Which of these statements is true
Option A:	Only 1
Option B:	Only 2
Option C:	Both
Option D:	none
18.	Which state first reserved 50% seats for women

Option A:	Andhra Pradesh
Option B:	Uttar Pradesh
Option C:	Madhya Pradesh
Option D:	Bihar
19.	Which statement is not correct regarding Gram Sabha
Option A:	It is a body consisting of persons registered in the electoral rolls of a village comprised within the area of the Panchayat level.
Option B:	It is a village assembly consisting of all the registered voters in the area of the Panchayat.
Option C:	Its powers have been determined by the Central Government
Option D:	Its powers and functions at village level are like state legislature at the state level
20.	Which of the following description best describes the principles concerning professional ethics
Option A:	Professional duties must be judged by ethical standards independent of time, place and circumstance
Option B:	Judging professional duties always involves reciprocal adjustment between ends and means
Option C:	Professional duties must by nature be deontological, i.e. he end must not come at the cost of the means
Option D:	Professional duties must be judged only by what they achieve in line with the ends prescribed by the ideals of business

Q2	**Solve any Four out of Six** **5 marks each**
A	As an engineer give your opinion on "Is the use of and development of nuclear power plant ethical?
B	Explain the Gandhian philosophy of rural development
C	List some problems and challenges faced by cooperatives today
D	Discuss the cannons of engineering ethics
E	Explain the four pillars of Smart city
F	Corporates become profitable at the cost of ethics. Argue in favour or against the statement and provide examples to justify your arguments

Q3	**Solve any Four out of Six** **5 marks each**
A	What is the concept of Community development
B	Give high lights of Balwant Rai Mehta committee report of 1957
C	Explain the Gandhian philosophy of rural development

D	Define Ethics, Ethical Dilemma
E	What are the functions of women cooperatives?
F	What is a gram sabha and how does it contribute to the development of a village

University of Mumbai

Examination 2021 under cluster ALL (Lead College: VCET)

Examinations Commencing from 15th June 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

==========

==========

=

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