

University of Mumbai
Examination Second Half 2021 under cluster (Lead College:)
Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester: VII

Course Code: ELX701

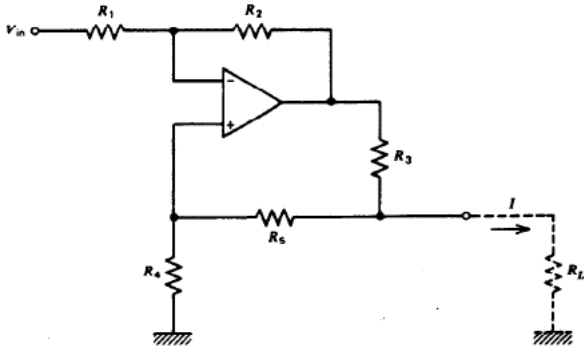
Course Name: Instrumentation System Design

Time: 2 hour 30 minutes

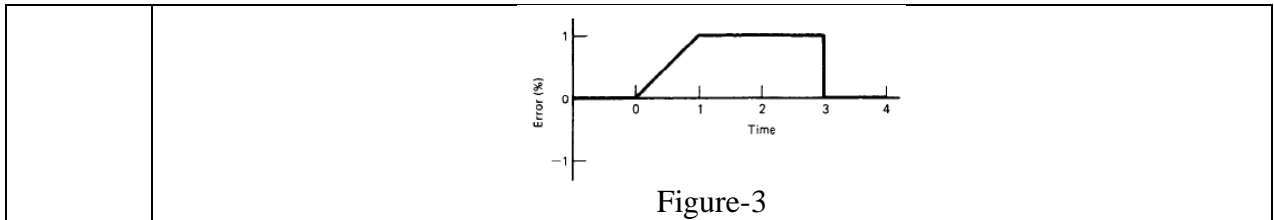
Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Pascal's law forms the basis of which of the following actuators?
Option A:	Electric actuators
Option B:	Pneumatic actuators
Option C:	Hydraulic actuators
2.	Which of the following is not a criterion for selection of control valve for an application?
Option A:	Volume of the fluid
Option B:	Temperature of the fluid
Option C:	Pressure involved
Option D:	Operator's choice
3.	Which of the following statements is not true for a 2-wire transmitter?
Option A:	The signal and the power is transmitted through separate wires
Option B:	They are loop powered transmitters
Option C:	They are cheaper than other types of transmitters.
Option D:	They are simple to set up
4.	The unloaded output of a sensor is sine wave with 200 Hz frequency and 5V amplitude. Its output resistance is 1KΩ. If a resistance of 500Ω is connected across the output as load, the sensor output voltage amplitude will be
Option A:	5V
Option B:	3.33V
Option C:	1.33V
Option D:	1.67V
5.	An integral controller has integral time $T_i = 4 \text{ min}$. The integral gain K_i will be
Option A:	4.17×10^{-3} per second
Option B:	2.92×10^{-3} per second
Option C:	0.25×10^{-3} per second
Option D:	4.00×10^{-3} per second
6.	Identify the control strategy shown in figure-1 below

	<p style="text-align: center;">Figure-1</p>
Option A:	Single loop control
Option B:	Cascade control
Option C:	Ratio control
Option D:	Split range control
7.	<p>For an oven following variables are specified: Heater - H (ON =1), Door - D (closed = 1), Temperature -T (over =1), Power switch - P (ON =1)</p> <p>It is required to achieve the following objective: The heater will on when power ON switch is activated, door of the oven is closed and temperature is below the limit</p> <p>The correct Boolean equation for above function will be</p>
Option A:	$H = D \cdot T \cdot P$
Option B:	$H = D \cdot T \cdot P$
Option C:	$H = D + \bar{T} + P$
Option D:	$H = D \cdot T \cdot P$
8.	In SCADA, RTU stands for
Option A:	Real Time Unit
Option B:	Relay Terminal Unit
Option C:	Remote Terminal Unit
Option D:	Relay Time Unit
9.	SAMA symbols are developed by
Option A:	Scientific Application Manufacturing Authority
Option B:	Scientific Apparatus Makers' Association
Option C:	Scientific American Manufacturing Association
Option D:	Scientific American Makers' Association
10.	Which of the following specifies the general requirements of calibration standards?
Option A:	ISA S82.01
Option B:	ISA S83.01
Option C:	ISA S84.01
Option D:	ISO/IEC 17025

Q2	
A	Solve any Two 5 marks each
i.	Describe the selection parameters for actuators
ii.	A low-pass filter circuit to required to attenuate 0.5MHz noise by 97%. Develop the necessary circuit specifying the critical frequency and values of R and C
iii.	Describe the ratiometric conversion method of signal conditioning for data acquisition system with neat diagram.
B	Solve any One 10 marks each
i.	Distinguish between quick opening, linear and equal percentage characteristics of control valves. Which factor decides the nature of these characteristics? List one application of control valve with each type of above characteristics.
ii.	Identify circuit shown in figure-2 below and derive the expression for output. <div style="text-align: center;">  <p style="text-align: center;">Figure-2</p> </div>

Q3	
A	Solve any Two 5 marks each
i.	Describe the necessity of receiver tank and pressure switch in a pneumatic system
ii.	Describe input/output scan mode and execute mode in operation of PLC.
iii.	Elaborate the statement: “Virtual instrumentation is the use of customizable software and modular measurement hardware to create user-defined measurement systems”.
B	Solve any One 10 marks each
i.	A sensor outputs a voltage from -2V to -1V. For interface to A/D converter, it needs to be 0 to 2.5V. Design the necessary signal conditioning circuit.
ii.	The error in system controlled by P+I controller varies as shown in figure-3 below. If the proportional gain is 5, integral gain 0.5 per second and $P_I(0)$ is 10%, plot the controller output as a function of time



Q4.

Q 4 A Solve any Two 5 marks each

i. List the methods of tuning the PID controller. Describe stepwise tuning procedure for any one of them.

ii. A discrete control process is shown in figure-4 below, Identify and list the input and output devices for this process.

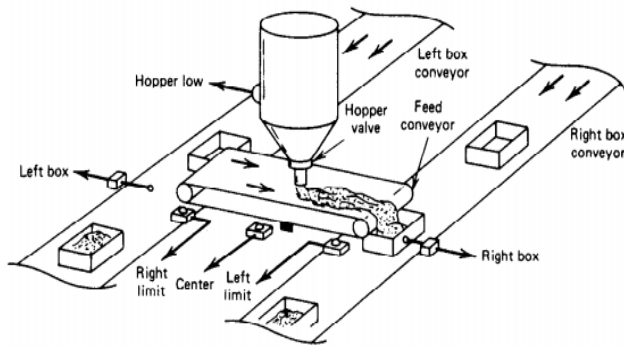


Figure-4

iii. Describe main features of ISA S84.01 standards

Q 4 B Solve any One 10 marks each

i. Prepare the physical and programmed ladder diagram for system shown in figure-5 below. With following hardware: NO START push button, NC STOP button, NO and NC limit switches.

The global objective is: To heat a liquid to a specified temperature and keep it there for 20 min.
 Event sequence:
 1. Fill the tank
 2. Heat and stir the liquid to temperature setpoint and hold for 20 min
 3. Empty the tank
 4. Repeat from step 1

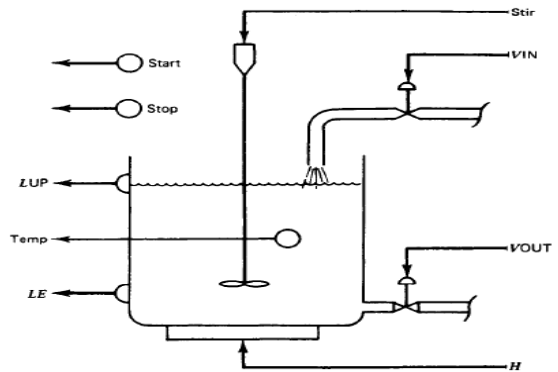


Figure-5

ii. Compare DAS and data logger. Draw the neat diagram and explain the input scanner block of data logger

University of Mumbai
Examination Second Half 2021 under cluster __ (Lead College: _____)

Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: Electronics Engineering

Curriculum Scheme: Rev2016

Examination: BEVII (Second Half 2021)

Course Code: **ELX702**

Course Name: **Power Electronics**

Time: 2hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Choose the false statement. An SCR is a -----.
Option A:	Semi controlled device
Option B:	Bi-directional Device
Option C:	Four layer, three junction device
Option D:	SCR are used for high-power applications
2.	In case of the UJT firing circuit, when the UJT turns on-----.
Option A:	the capacitor starts to charge
Option B:	the capacitor remains unaffected
Option C:	the capacitor starts to discharge
Option D:	Cannot predict
3.	In case of an RC half wave triggering circuit, the firing angle can be ideally varied between-----.
Option A:	0 to 90 degree
Option B:	90 to 180 degree
Option C:	30 to 120 degree
Option D:	0 to 180 degree
4.	A single-phase semi-converter is connected to a 230 V source and is feeding a load $R = 10 \Omega$ in series with a large inductance that makes the load current ripple free. Find the average output current for $\alpha = 45^\circ$.
Option A:	14.6A
Option B:	7.2A
Option C:	10A
Option D:	17.67A
5.	For a class C commutation circuit, the dc source voltage $E_{dc}=100V$, the current through both resistors R_1 and $R_2 =10A$. The turnoff time of both SCRs is 40us. Calculate the commutating capacitance C for successful commutation.
Option A:	10 uF
Option B:	2.2 uF
Option C:	6.75uF
Option D:	5.76uF
6.	What is the range of firing angle for Inverting mode of operation of full wave controlled rectifier?
Option A:	$\alpha < 90$ degree
Option B:	α is above 90 degree

Option C:	α is between 90 to 180 degree
Option D:	α between 0 to 180 degree
7.	A chopper circuit is operated on Time ratio control at a frequency of 2kHz on a 48V DC supply. If the load voltage is 36V, the conduction period of power switch is-----.
Option A:	1msec
Option B:	0.5 msec
Option C:	0.667 msec
Option D:	0.375 msec
8.	An inter-group reactor is used in a single phase cyclo converter circuit to-----.
Option A:	Reduce current ripples
Option B:	Reduce voltage ripples
Option C:	Limit di/dt in the power switch
Option D:	Limiting circulating current
9.	A single phase full bridge inverter is operated from a 24V battery and is supplying power to a pure resistive load of 20W. Determine Inverter output current and fundamental component of output voltage.
Option A:	1A, 24V
Option B:	0.833A, 21.6 V
Option C:	1A, 10V
Option D:	1.2A, 21.6V
10.	If the anode of an SCR is made positive with respect to the cathode & suitable gate current is applied then-- ----.
Option A:	middle junction J2 Reversed biased, J1&J3 Forward Biased
Option B:	middle junction J2 Forward biased, J1&J3 Reverse Biased
Option C:	all the junctions are Reversed biased
Option D:	all the junctions are Forward biased

Q2.	Solve any Two Questions out of Three 10 marks each
A	Draw and explain dynamic Turn-ON and Turn-OFF characteristics of SCR.
B	A single phase semi converter is operated from 230V, 50 Hz ac supply. The load resistance is 5 Ω , the average output voltage is 15% of the maximum possible output voltage. Determine i) Firing angle ii) RMS and average Output Voltage iii) RMS and average Thyristor current iv) Rectification Efficiency v) Input power factor
C	What is the need of voltage control and harmonic reduction in inverter circuits. Draw and explain voltage control of inverter using sinusoidal PWM technique.

Q3.	Solve any Two Questions out of Three 10 marks each
A	Explain the working of single phase cycloconverter with circuit diagram and waveforms. List industrial application of cycloconverters.

B	Design UJT relaxation Oscillator circuit for SCR using following data: A UJT 2646 is used to trigger the thyristor whose minimum gate triggering voltage is 6.2V, The UJT ratings are: $\eta = 0.66$, $I_p = 0.5 \text{ mA}$, $I_v = 3 \text{ mA}$, $R_{bb} = 5 \text{ K}\Omega$, leakage current = 3.2mA, $V_p = 14 \text{ v}$ and $V_v = 1 \text{ V}$. Oscillator frequency is 2kHz and capacitor $C = 0.04 \mu\text{F}$.
C	Draw and explain single phase fully controlled converter with RL load .Draw load current, Load voltage, input voltage, voltage across thyristors and gating signal for $\alpha = 60^\circ$.

Q4.	Solve any Two Questions out of Three 10 marks each
A	Explain the working of parallel Inverter using neat circuit diagram and waveforms. Also explain the advantages of parallel Inverters over Series Inverters.
B	Compare Power BJT, Power MOSFET, IGBT, TRIAC and GTO.
C	A boost converter supplied at 8V, gives average output voltage 16V and average load current 0.5A. The switching frequency is 20KHz. If $L = 160 \mu\text{H}$ and $C = 380 \mu\text{F}$. Compute a) duty cycle, b) ripple current of inductor c) peak current of inductor d) ripple voltage of filter capacitor.

University of Mumbai

Examination Second Half 2021 under cluster __ (Lead College: _____)

Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: Electronics Engineering

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX703 and Course Name: Digital Signal Processing

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	If an N is a 8 point sequence, the total number of complex additions and multiplications using direct computation of DFT are,
Option A:	56 and 64
Option B:	64 and 56
Option C:	28 and 32
Option D:	28 and 64
2.	The inverse DFT of $Y(k) = \{ 1,0,1,0 \}$ is,
Option A:	$y(n) = \{ 0.5,0,0.5,0 \}$
Option B:	$y(n) = \{ 1,0,1,0 \}$
Option C:	$y(n) = \{ 1,2,3,4 \}$
Option D:	$y(n) = \{ 0,0.5,0,0.5 \}$
3.	Poles of a Butterworth Filter
Option A:	lies on an ellipse
Option B:	do not lie in simple geometric pattern
Option C:	lies on a rectangle
Option D:	lies on a circle
4.	Which method is not suitable for designing high pass filter?
Option A:	Bilinear Transformation Method
Option B:	Frequency Transformation Method
Option C:	Window Method
Option D:	Impulse Invariant Method
5.	A filter is said to be linear phase filter if the phase delay and group delay are _____
Option A:	High
Option B:	Moderate

Option C:	Low
Option D:	Constant
6.	What is the approximate transition width of main lobe of a Blackman window of length M-1?
Option A:	$12\pi/M$
Option B:	$2\pi/M$
Option C:	$4\pi/M$
Option D:	$8\pi/M$
7.	A digital system is characterized by the difference equation $y(n) = 0.9y(n-1)+x(n)$ with $x(n)=0$ and initial condition $y(-1)= 12$.What is the interval of the deadband of the system
Option A:	[-4,4]
Option B:	[-5,5]
Option C:	[-10,10]
Option D:	[-15,15]
8.	Decimation is a process in which the sampling rate is _____.
Option A:	enhanced
Option B:	stable
Option C:	reduced
Option D:	unpredictable
9.	To what value should the bandwidth of $x(n)$ has to be reduced in order to avoid aliasing?
Option A:	F/D
Option B:	F/2D
Option C:	F/4D
Option D:	FD
10.	The operations such as convolution, correlation which require array multiplications can be easily performed in DSP with the help of
Option A:	Arithmetic Logic Unit (ALU)
Option B:	Dedicated hardware unit called as Multiplier and Correlator
Option C:	Dedicated hardware unit called as Multiplier Accumulator (MAC)
Option D:	Bus

Q2 (20 Marks)	
A	Solve any Two 5 marks each
i.	Differentiate between General Purpose and Special Purpose DSP Processors
ii.	Write a short note on Warping Effect.
iii.	Explain Finite word length effects in FIR digital filters.
B	Solve any One 10 marks each
i.	Compute 8 point DFT of DT sequence $x(n) = \{ 1, 2, 1, 2, 1, 3, 1, 3 \}$ using radix-2 DIT FFT algorithm:
ii.	Design an analog high pass Butterworth filter that has $\alpha_p = 3$ dB; $\alpha_s = 15$ dB; $\Omega_p = 1000$ rad/sec $\Omega_s = 500$ rad/sec.

Q3 (20 Marks)	
A	Write short notes on any Two 5 marks each
i.	Gibbs phenomenon
ii.	Zero-input limit cycle oscillations and Overflow limit cycle oscillations
iii.	Sample rate conversion
B	Solve any One 10 marks each
i.	Using DFT and IDFT method obtain circular convolution of $x(n)$ and $h(n)$ given by $x(n) = 2 u(n) - u(n-2) - u(n-4)$ and $h(n) = 3 \delta(n) - 2 \delta(n-1) + \delta(n-2)$
ii.	Using Bilinear transformation method, design a high pass filter, monotonic in passband with $\alpha_p = 3\text{dB}$, cut off frequency of 1000 Hz and $\alpha_s = 10\text{dB}$ at stopband frequency 350 Hz. The sampling frequency is 5000 Hz.

Q4 (20 Marks)	
A	Solve any Two 5 marks each
i.	Explain Decimator and Interpolator with neat block diagrams.
ii.	Describe the Fourier Series method for designing FIR filters
iii.	Define Truncation and Rounding.
B	Solve any One 10 marks each
i.	Explain any two applications of DSP with neat block diagram.
ii.	Explain designing steps of Frequency sampling technique to design FIR filters.

Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2016

Examination: B.E Sem. VII

Course Code: ECCDLO 7031 and Course Name: Neural Networks and Fuzzy Logic

Time: 2 Hour and 30 Min

Max. Marks: 80

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

Q1.	Multilayer perceptron neural network application is well justified in solving _____.
Option A:	Nonlinear complex problems
Option B:	Boolean Problems only
Option C:	OR and AND type of problems only
Option D:	Linear Problems only
Q2.	Number of neurons required in the hidden layer of the neural network are
Option A:	set equal to number of outputs to the neural network.
Option B:	determined experimentally based on the complexity of problem or application
Option C:	set equal to number of inputs to the neural network
Option D:	set equal to sum number of inputs and outputs of the neural network.
Q3.	A non-linear activation function is used to make the output of a neuron
Option A:	Unbounded
Option B:	Bounded
Option C:	Reduced
Option D:	Amplified
Q4.	Linguistic membership graph that can be used to represent a fuzzy set is _____.
Option A:	Elliptical
Option B:	Rectangular and Conical
Option C:	Conical and Elliptical
Option D:	Triangular
Q5.	Kohonen network is a
Option A:	Re-enforced type
Option B:	Supervised net
Option C:	Competitive net
Option D:	Adaline net
Q6.	Error correction learning is type of

Option A:	Kohonen learning
Option B:	Unsupervised learning
Option C:	Competitive learning
Option D:	Supervised learning
Q7.	Following cannot be specified using fuzzy logic
Option A:	Speed of a train
Option B:	weight of a person
Option C:	Roll number of a candidate
Option D:	Colour of a tomato
Q8.	When two classes can be separated by a line, they are known as?
Option A:	Linearly separable
Option B:	Linearly inseparable classes
Option C:	May be separable or inseparable, it depends on system
Option D:	Binary logic
Q9.	Which one of the following is not a defuzzification method
Option A:	Centre of Area
Option B:	Centre of Gradient
Option C:	Max-membership
Option D:	Mean of maxima
Q10.	Fuzzy logic is a form of which of the following logic?
Option A:	Two-valued logic
Option B:	Crisp set logic
Option C:	Many-valued logic
Option D:	Binary set logic

Q2	Solve any Four out of Six	(5 marks each)
A	Draw a Biological Neuron and the corresponding Artificial Neuron.	
B	What are fuzzy membership functions? What are the various types of membership functions used for fuzzification?	
C	Draw the flow chart of K means algorithm and write its applications.	
D	Show using graphs, the data separation performed by two input EXOR function and two input OR function Also, comment on the graphs.	
E	Define defuzzification and brief any one method used for defuzzification.	
F	With an epoch verses error curve brief about the concept of Training and Cross-validation.	

Q3	
A	Solve any Two 5 marks each
i.	Implement 2 input OR gate using MP neuron
ii.	Draw the flow chart of training algorithm for Kohonen network.
iii.	Draw the block diagram of Fuzzy Inference System and brief about the inference component.
B	Solve any One 10 marks each
i.	Explain solving EXOR problem using RBF and MLP with an example of feature space plot or scatter plot.
ii.	Brief the process of a) Character recognition and b) image compression using neural networks with the help of block diagrams

Q4	Solve any 2 out of Three (10 marks each)
A	Draw a Hopfield network required to store the following pattern: $P = [1 \ -1 \ -1 \ 1]^T$ Evaluate the weight matrix of the Hopfield Network and write conclusion on any two properties of Hopfield weight matrix thus obtained.
B	Implement a fuzzy controller for the control of break-power of a train approaching station. Inputs are speed and distance of train from station and output is break-power. Use triangular membership function. Consider two descriptors for inputs and three descriptors for output. Devise a set of rules for control action and defuzzification. The implementation needs be supported by figures wherever possible. Design a fuzzy controller for a train with high speed and small distance.
C	If the weight vectors for the cluster units are given by: $W_1 = [0.8 \ 0.6 \ 0.5]$ $W_2 = [0.5 \ 0.4 \ 0.6]$ Draw a Kohonen Self-Organizing net with two cluster units and three input units. Find the winner cluster unit for the input pattern $P = [0.5 \ 0.3 \ 0.2]$ given that learning rate is 0.2. Also find the new weights for the winning unit

University of Mumbai
Examination Second Half 2021 under cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: **Electronics Engineering**

Curriculum Scheme: Rev2016

Examination: BE Semester: VII

Course Code: ELXDLO7032 and Course Name: Advanced Networking Technologies

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	In IEEE 802.11, the access method used in the DCF sublayer is----
Option A:	ALOHA
Option B:	Slotted ALOHA
Option C:	CSMA/CA
Option D:	CSMA/CD
2.	In Virtual Circuit Identifier, the VCI is --- bits in an UNI and ----bits in NNI
Option A:	8,16
Option B:	16,8
Option C:	8,8
Option D:	16,16
3.	Bluetooth baseband technology supports following two links:
Option A:	SCO and ACL
Option B:	Pt-to-Pt and Pt-to Multipoint
Option C:	Connection oriented and connectionless
Option D:	Unicast and Multicast
4.	Which of the following is NOT application of Wireless Sensor Network?
Option A:	Environmental Observations
Option B:	Military area
Option C:	Wireless head sets
Option D:	Health care
5.	The general layers of Network design are
Option A:	Core ,Distribution and Access
Option B:	Application ,Access, Premises and Backbone
Option C:	Physical, Data link and Network
Option D:	Application, Access and Physical
6.	The SONET has ---layers
Option A:	DXC,PTE,SDXC,CPE

Option B:	PTE,STE,LTE and CPE
Option C:	Physical, Section, Line and Path.
Option D:	DXC,PTE,CPE and Path
7.	Which of the following are NOT the network security threats?
Option A:	Unauthorized access
Option B:	Firewall
Option C:	DDOS
Option D:	Impersonification
8.	RMON is a method of collecting and analyzing information from-----N/W Elements.
Option A:	Remote
Option B:	Monitor
Option C:	Access
Option D:	Host
9.	-----protocol is a popular example of a link state routing protocol.
Option A:	SPF
Option B:	BGP
Option C:	RIP
Option D:	OSPF
10.	Cloud computing is based on combining physical resources and represents them as----- resources to user.
Option A:	Real
Option B:	Imaginary
Option C:	Virtual
Option D:	Cloud

Q2 (20 Marks)	Solve any Two Questions out of Three (10 marks each)
A	Explain in detail Bluetooth protocol stack
B	Explain the DWDM technology in detail, with a neat schematic diagram.
C	Compare ubiquitous and hierarchical access in Access Network Design

Q3 (20 Marks)	Solve any Two Questions out of Three (10 marks each)
A	Draw and explain IEEE 802.15.4 LR-WPAN device architecture and its Network topology.
B	Write in detail about Simple Network Management Protocol (SNMP).
C	Explain ATM model and AAL with respect to services and protocol.

Q4.(20 Marks)	Solve any Two Questions out of Three (10 marks each)
A	EXPLAIN INTRADOMAIN AND INTERDOMAIN ROUTING? DESCRIBE WORKING OF Routing Information Protocol (RIP).
B	Explain Network security safeguards in detail

C	What is cloud computing? What are the different types of Cloud computing?
---	---

University of Mumbai

Examination Second Half 2021 under cluster 4 (Lead College: Fr.Agnel Vashi)

Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: 1T01427 // BE (Mechanical Engineering) (SEMVII)(Choice Base Credit Grading System)(R2016)

Curriculum Scheme: Rev2016

Examination: BE Semester VII

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

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following phase is not part of the planning Cybercrime ?
Option A:	Social-engineering attack
Option B:	Launching an attack
Option C:	Scanning and scrutinizing
Option D:	Reconnaissance
2.	Every Promise and set of promises forming the consideration for each other called as _____
Option A:	Consideration
Option B:	Promise
Option C:	Agreement
Option D:	Acceptance
3.	Which of the following is NOT a Intellectual Property
Option A:	Industrial Design
Option B:	Patents
Option C:	Testimony
Option D:	Trademarks
4.	What does a trademark protects?
Option A:	an invention
Option B:	the look, shape and feel of a product
Option C:	a secret formula
Option D:	logos, names and brands
5.	_____known as the Financial Services Modernization Act ?
Option A:	GLBA
Option B:	HIPPA
Option C:	ISO
Option D:	SOX
6.	_____aim to start the interaction with the victim directly with the help of the internet.
Option A:	Offline Stalkers

Option B:	Online Stalkers
Option C:	Passive attack
Option D:	Virus
7.	If you use your mobile phone for purchasing goods/services and for banking, you could be more vulnerable to a _____
Option A:	Smishing
Option B:	Spamming
Option C:	Mishing
Option D:	Vishing
8.	Sending a fake e-mail to the user and asking him to reenter a password in a web page to confirm it is type of the_____.
Option A:	Cyberstalking
Option B:	Path Scanning
Option C:	Human based social-engineering
Option D:	Computer based social-engineering
9.	Which of the Following is NOT a Type of a E-commerce
Option A:	Citizen to Government
Option B:	Consumer to Consumer
Option C:	Business to Consumer
Option D:	Business to Business
10.	Which of the following is NOT a objective of Information Technology Act, 2000 ?
Option A:	Grant legal recognition to E-Transactions
Option B:	Provide legal recognition to Digital Signatures for authentication
Option C:	Allow Electronic storage of data
Option D:	Reject E-Filing of data and information due to attack

Q2.	Solve any Four out of Six	5 marks each
A	Explain different types of intellectual property.	
B	Explain various security challenges posed by mobile devices.	
C	What do you understand by DOS and DDOS attack?	
D	Explain types of credit card fraud and protection against it ?	
E	Explain in detail active and passive attacks with examples.	
F	Explain about IT Act. 2008 and its Amendments ?	

Q3.	Solve any Two Questions out of Three	10 marks each
A	What are digital Signatures?.Explain the legal architecture required for the validity of digital signature.	

B	Explain in detail Attacks on Wireless Networks ?
C	Explain How criminal plan the attacks with examples ?

Q4.	
A	Solve any Two 5 marks each
i.	Identify and explain Security Implications for Organizations ?
ii.	Explain about the Cybercrime and Indian ITA 2000 ?
iii.	Differentiate between Trojan Horse and Backdoors.
B	Solve any One 10 marks each
i.	Explain Information Security compliance HIPAA and ISO ?
ii.	What is E-commerce? Explain different types of e-commerce with suitable examples.

University of Mumbai

Examination Second Half 2021 under cluster All (Lead College: All)

Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: Mechanical Engineering

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO7013 and Course Name: Management Information System

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The web development technique that enables portions of web pages to reload with fresh data rather than requiring the entire Web page to reload is known as:
Option A:	AJAX
Option B:	RSS
Option C:	Tagging
Option D:	Web 2.0
2.	Social computing forces companies to deal with customers _____
Option A:	Reactively
Option B:	Proactively
Option C:	Neutrally
Option D:	Economically
3.	Which function provides information about the quality of in-process semifinished and finished products in an organization.
Option A:	Quality Control.
Option B:	Planning Production and Operations
Option C:	Investment Management.
Option D:	Inventory Management.
4.	Types of data warehouse does not include ____
Option A:	Enterprise data warehouse

Option B:	Data marts
Option C:	Data acquisition center
Option D:	Operational data warehouse
5.	Which of the following is an example of the business value of collaborative CRM?
Option A:	Provides all users with the tools and information that fit their individual roles and preferences
Option B:	Improves efficiency and integration throughout the supply chain
Option C:	Empowers all employees to respond to customer demands more quickly
Option D:	Synchronizes customer interaction with greater convenience through a variety of channels, including phone, fax, e-mail, chat, and mobile devices
6.	A manufacturing approach that integrates several computerized systems, such as computer-assisted design (CAD), computer assisted manufacturing (CAM)
Option A:	Sales force automation
Option B:	Computer-integrated manufacturing
Option C:	Product Lifecycle Management
Option D:	Management of interdependent items
7.	A business strategy that enables manufacturers to share product-related data that support product design and development and supply chain operations is_____
Option A:	Planning Production and Operations
Option B:	Quality Control
Option C:	Product Lifecycle Management.
Option D:	Control and Auditing
8.	_____ 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:	Shopping Communities

Option C:	Social marketplaces
Option D:	Peer-to-peer shopping models
9.	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.
10.	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 Two out of Three	10 marks each
--------------------------------	-----------------------------------	----------------------

A	What is Cloud Computing? Explain its models.?
B	Explain the types of information system in business organization.
C	Identify the three major types of controls that organizations can use to protect their information resources, and provide an example of each one?

Q3 (20 Marks)	Solve any Two out of Three	10 marks each
A	Explain Data warehouse and Data mart in detail.	
B	Differentiate between knowledge and information and explain the significance of knowledge for a business firm.	
C	Differentiate computer network wired and wireless technology with example?	

Q4 (20 Marks)	Solve any Two out of Three	10 marks each
A	Explain the various phases of SDLC models.	
B	What are the functional areas of information system?	
C	Describe how cloud computing can help organizations expand the scope of their business operations.	

University of Mumbai

Examinations Commencing from 22nd November 2021 to 5th January 2022

Program: ALL Institute Level Optional Course 1

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7015 and Course Name: Operations research

Time: 2 hour 30 minutes

Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The LP problem will not have a feasible solution.
Option A:	If all elements in the pivot column are positive.
Option B:	If all the elements in the pivot row are negative.
Option C:	If all the elements in RHS column are non-negative.
Option D:	If an artificial variable is present in the basis.
2.	In LPP, to convert \geq inequality constraint into equality constraint, we must
Option A:	add a surplus variable
Option B:	subtract a surplus variable and add an artificial variable
Option C:	subtract a surplus variable and an artificial variable
Option D:	subtract a slack variable
3.	The optimality of current solution to a transportation problem with m rows and n columns can be checked if the number of positive allocations is
Option A:	m x n
Option B:	m + n
Option C:	m + n - 1
Option D:	m + n + 1
4.	The problem of assigning n workers to n tasks has
Option A:	n! solutions.
Option B:	(n-1)! Solutions.
Option C:	n solutions.
Option D:	n ² solutions.
5.	The dual of the primal maximization LP problem having m constraints and n non-negative variables is
Option A:	minimization LP problem having n constraints and m non-negative variables.
Option B:	minimization LP problem having m constraints and n non-negative variables.
Option C:	maximization LP problem having m constraints and n non-negative variables.
Option D:	maximization LP problem having n constraints and m non-negative variables.
6.	As order size increases,
Option A:	total inventory costs will increase, reach a maximum and then decrease.
Option B:	total inventory cost will decrease, reach a minimum and then increase.

Option C:	ordering cost and inventory carrying cost, both will increase.
Option D:	ordering cost and total inventory cost, both will increase.
7.	In real life queuing system, if an arrival refuses to join the queue even if there is a space to join then this phenomenon is called as
Option A:	Balking
Option B:	Reneging.
Option C:	Jockeying.
Option D:	Dissenting.
8.	Any game can be solved by using
Option A:	Graphical method.
Option B:	Dominance principle.
Option C:	Linear Programming method.
Option D:	Game transpose method.
9.	When minimax and maximin values of the game are same
Option A:	No solution exists
Option B:	Solution has mixed strategies
Option C:	Solution has pure strategies
Option D:	Multiple solutions exist
10.	A stage in a dynamic programming problem represents
Option A:	number of decision alternatives
Option B:	different time periods in the planning period
Option C:	status of the system at a particular state
Option D:	condition of the decision process

Q2	Solve any Two Questions out of Three	10 marks each
A	<p>Write Dual of following LPP and solve it using graphical method. Find values of decision variables in primal using complementary slackness theorem.</p> <p>Maximize</p> $Z = 3x_1 + x_2 + 4x_3$ <p>Subject to</p> $6x_1 + 3x_2 + 5x_3 \leq 25$ $3x_1 + 4x_2 + 5x_3 \leq 20$ $x_1, x_2, x_3 \geq 0$	
B	<p>Solve the following linear program by the dual simplex method.</p> <p>Minimize</p> $Z = 2x_1 + 3x_2 + 5x_3 + 6x_4$ <p>Subject to</p> $x_1 + 2x_2 + 3x_3 + x_4 \geq 2$ $-2x_1 + x_2 - x_3 + 3x_4 \leq -3$ $x_1, x_2, x_3, x_4 \geq 0$	

C	<p>The owner of a chain of grocery store has purchased six crates for fruits. The following table gives the estimated profit at each grocery store when it is allocated various numbers of crates.</p>			
	No of crates	Stores		
		1	2	3
	0	0	0	0
	1	4	2	6
	2	6	4	8
	3	7	6	8
	4	7	8	8
	5	7	9	8
6	7	10	8	
<p>The owner does not want to split the crates among stores, but willing to make zero allocations. Find the allocations of crates to stores to maximize the profit.</p>				

Q3	Solve any Two Questions out of Three	10 marks each					
A	<p>Find the optimal transportation plan.</p>						
	Sources	Destinations					Supply
		1	2	3	4	5	
	A	5	4	2	3	7	80
	B	6	3	4	5	6	60
	C	4	6	7	4	3	40
	D	3	5	5	6	4	20
Demand	60	60	30	40	10	Total 200	
B	<p>A company is engaged in manufacturing different types of equipment for various consumers. The company has two assembly lines to produce its product. The processing time for each of the assembly lines is regarded as random variable and is described by the following distributions:</p>						
	Processing time in min	Assembly X		Assembly Y			
	40	0.10		0.20			
	42	0.15		0.40			
	44	0.40		0.20			
	46	0.10		0.15			
	48	0.25		0.05			
<p>Using the following random numbers, generate data on the processing times for the 10 units of the product and compute the expected processing time for the product and average in process waiting time.</p> <p style="text-align: center;">5936, 8723, 1973, 3649, 9081, 2863, 3529, 4173, 5721, 6257.</p>							

	For the purpose, read the numbers horizontally, taking the first two digits for the processing time on assembly X and the last two digits for processing time on assembly Y.
C	An owner of car service station on highway purchases cans of engine oil at the rate of Rs. 400 per can. He needs 40 cans every day. The holding cost can be approximated to Rs.2 per can per day. The shortage cost is Rs.10 per can per day. The ordering and other cost is Rs.1000 per order. Decide minimum cost procurement quantity. What is the maximum level of inventory? Sketch the inventory system. Also find optimal total estimated system cost and reorder point if lead time is 2 days.

Q4.	Solve any Two Questions out of Three	10 marks each																															
A	Reduce the following game using Principle of dominance and graphical method to determine optimal strategies for A and B. Find value of game.	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" rowspan="2"></td> <td colspan="4" style="text-align: center;">B</td> </tr> <tr> <td>Y1</td> <td>Y2</td> <td>Y3</td> <td>Y4</td> </tr> <tr> <td rowspan="4" style="text-align: center;">A</td> <td>X1</td> <td>20</td> <td>7</td> <td>8</td> <td>6</td> </tr> <tr> <td>X2</td> <td>8</td> <td>44</td> <td>15</td> <td>10</td> </tr> <tr> <td>X3</td> <td>13</td> <td>9</td> <td>19</td> <td>5</td> </tr> <tr> <td>X4</td> <td>9</td> <td>8</td> <td>14</td> <td>-1</td> </tr> </table>			B				Y1	Y2	Y3	Y4	A	X1	20	7	8	6	X2	8	44	15	10	X3	13	9	19	5	X4	9	8	14	-1
		B																															
		Y1	Y2	Y3	Y4																												
A	X1	20	7	8	6																												
	X2	8	44	15	10																												
	X3	13	9	19	5																												
	X4	9	8	14	-1																												
B	Four different jobs are to be processed on four different machine. The machining cost associated with jobs and machine combination is given in the following table. Please provide optimal allocation of jobs on machines so that the total cost of processing is minimum. An asterisk represents restricted allocation.	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>Jobs/Machines</th> <th>M1</th> <th>M2</th> <th>M3</th> <th>M4</th> </tr> <tr> <td>J1</td> <td>6</td> <td>8</td> <td>*</td> <td>7</td> </tr> <tr> <td>J2</td> <td>9</td> <td>6</td> <td>10</td> <td>7</td> </tr> <tr> <td>J3</td> <td>5</td> <td>8</td> <td>11</td> <td>8</td> </tr> <tr> <td>J4</td> <td>11</td> <td>5</td> <td>9</td> <td>4</td> </tr> </table>	Jobs/Machines	M1	M2	M3	M4	J1	6	8	*	7	J2	9	6	10	7	J3	5	8	11	8	J4	11	5	9	4						
Jobs/Machines	M1	M2	M3	M4																													
J1	6	8	*	7																													
J2	9	6	10	7																													
J3	5	8	11	8																													
J4	11	5	9	4																													
C	<p>A bank has two counters for withdrawals. One counter handles withdrawals of value less than 1000 rupees and the other counter above 1000 and above. Analysis of service time shows an exponential distribution with mean service time of 6 minutes per customer for each counter. Arrival of customers follow Poisson distribution with mean 8 per hour for the first counter and 5 per hour for the second counter.</p> <p>i) What are the average waiting times per customer of each counter?</p> <p>ii) If each counter could handle all withdrawals irrespective of their value, how would the average waiting time change?</p>																																