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

EXAMINATION TIME TABLE (JANUARY 2021)
PROGRAMME - B.E. (Electronics)(REV-2016) (Choice Based)
SEMESTER - VII

Days and Dates	Time	Course Code	Paper
Friday, January 08, 2021	03:30 p.m. to 05:30 p.m.	ELX701	Instrumentation System Design
Monday, January 11, 2021	03:30 p.m. to 05:30 p.m.	ELX702	Power Electronics
Wedneday, January 13, 2021	03:30 p.m. to 05:30 p.m.	ELX703	Digital Signal Processing
Friday, January 15, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7031	Department Level Optional zcourses III: Neural Network & Fuzzy Logic
Friday, January 15, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7032	Advance Networking Technologies
Friday, January 15, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7033	Robotics
Friday, January 15, 2021	03:30 p.m. to 05:30 p.m.	ELXDLO7034	Integrated Circuit Technology
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7011	Institute Level Optional Course-I :- Product Life Cycle Management
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7012	Reliability Engineering
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7013	Management Information Systems
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7014	Design of Experiments
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7015	Operations Research
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7016	Cyber Security & Laws
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7017	Disaster Management & Mitigation Measures
Wednesday, January 20, 2021	03:30 p.m. to 05:30 p.m.	ILO7018	Energy Audit & Management
Wednesday, January 20, 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.**

Principal

Mumbai
20th December, 2020.

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

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX701 Course Name: Instrumentation System Design

Time: 2 hour Max. Marks: 80

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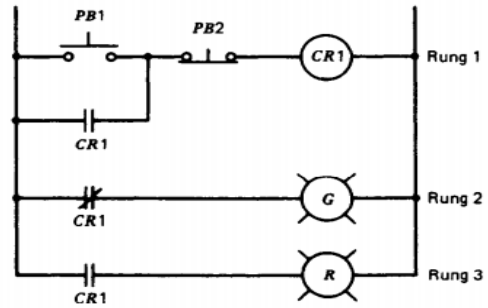
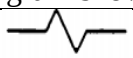
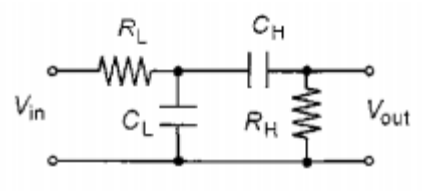
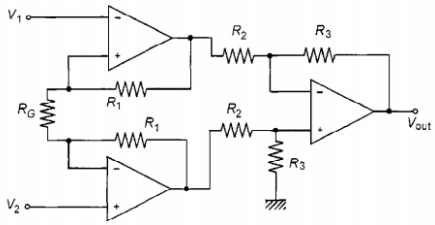
Note:
1. Question 1 (40 Marks): All the Questions are compulsory and carry 2 marks each.
2. Question 2 (20 Marks): Solve any Two Questions out of Three 10 marks each.
3. Question 3 (20 Marks): Solve any Two Questions out of Three 10 marks each.

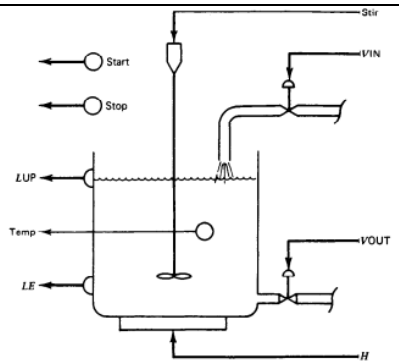
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Hydraulic systems work on the basis of
Option A:	Ohm's law
Option B:	Boyle's law
Option C:	Pascal's law
Option D:	Kirchhoff's law
2.	In a 4/3 control valve, the numbers 4 and 3 indicate
Option A:	Number of positions and number of input lines respectively
Option B:	Number of ports and number of positions respectively
Option C:	Number of positions and number of ports respectively
Option D:	Number of positions and number of output lines respectively
3.	Standard ranges of current and pressure for transmission in an instrumentation system are
Option A:	0 -20 mA and 0-15 psi
Option B:	4 -20 mA and 0-15 psi
Option C:	0 -20 mA and 3-15 psi
Option D:	4 -20 mA and 3-15 psi
4.	In flapper nozzle assembly, the output pressure
Option A:	increases as the distance between flapper and nozzle increases
Option B:	increases as the distance between flapper and nozzle decreases
Option C:	remains constant as the distance between flapper and nozzle increases
Option D:	first increases and then decreases as the distance between flapper and nozzle increases
5.	Offset in proportional controller can be removed by adding
Option A:	integral action
Option B:	derivative action
Option C:	decreasing the gain
Option D:	cannot be removed

6.	Derivative control action
Option A:	increases the speed of response
Option B:	removes the offset caused by proportional action
Option C:	Can make the system unstable
Option D:	has no effect on system
7.	In the following ladder diagram of figure1, when PB1 is pressed,  Figure1
Option A:	Red light will be ON
Option B:	Green light will be ON
Option C:	Both lights will be ON
Option D:	Both lights will be OFF
8.	Match the following symbols in the ladder diagram shown in figure2 below Motor — 1.  Solenoid — 2.  Light — 3.  Control relay — 4.  Figure2
Option A:	Motor-2, solenoid-3, light-1, Control relay- 4
Option B:	Motor-1, solenoid-2, light-3, Control relay- 4
Option C:	Motor-3, solenoid-2, light-4, Control relay- 1
Option D:	Motor-3, solenoid-1, light-2, Control relay- 4
9.	Operation of PLC consists of
Option A:	I/O scan mode, Fetch cycle mode, execution mode
Option B:	I/O scan mode, execution mode
Option C:	I/O scan mode, Fetch cycle mode
Option D:	None of the options mentioned
10.	The methods of signal conditioning which are particularly applicable with advantage to data acquisition are
Option A:	Only ratiometric conversion
Option B:	Only logarithm conversion
Option C:	Both ratiometric and logarithm conversion
Option D:	Neither ratiometric nor logarithm conversion

11.	Which of the following statement is false?
Option A:	All data loggers are data acquisition system
Option B:	All data acquisition systems are data loggers
Option C:	Data logger and Data acquisition systems are same in operation
Option D:	All of the mentioned
12.	The acronym SAMA stands for
Option A:	Scientific Apparatus Makers Association
Option B:	Scientific Application of Market Analysis
Option C:	Systems Analysis of Manufacturers in America
Option D:	Systematic Analysis of Market Apparatus
13.	NEMA 250 standard
Option A:	Specifies the enclosures for electrical and electronic equipment maximum up to 250V
Option B:	Specifies the enclosures for electrical and electronic equipment maximum up to 440V
Option C:	Specifies the enclosures for electrical and electronic equipment maximum up to 500V
Option D:	Specifies the enclosures for electrical and electronic equipment maximum up to 1000V
14.	Basic element of communication protocol are set of symbols called
Option A:	Hardware set
Option B:	Software set
Option C:	Character set
Option D:	None of the options mentioned
15.	A positive displacement hydraulic pump
Option A:	delivers a fixed volume of fluid from inlet to outlet for each cycle regardless of pressure at the outlet port.
Option B:	delivers a variable volume of fluid from inlet to outlet for each cycle regardless of pressure at the outlet port.
Option C:	has a back leakage path in case of high pressure at outlet port
Option D:	None of the options mentioned
16.	Cascade control should generally not be used if
Option A:	the inner loop is not at least two times faster than the outer loop
Option B:	the inner loop is not at least three times faster than the outer loop
Option C:	the inner loop is not at least four times faster than the outer loop
Option D:	None of the options mentioned
17.	If there are 6 variables in a discrete state process control, number of discrete states will be
Option A:	6
Option B:	16
Option C:	32
Option D:	64
18.	Basic Elements of PLC are
Option A:	Input module, output module, processor

Option B:	Input module, output module, processor, programming unit
Option C:	Input module, output module, processor, programming unit, RAM/ ROM
Option D:	Input module, output module, processor, programming unit, RAM/ ROM, ladder diagram
19.	The circuit shown in figure3 below will act as  Figure3
Option A:	Low pass filter
Option B:	High pass filter
Option C:	Band pass filter
Option D:	Band reject filter
20.	In the instrumentation amplifier shown in figure4 below, the gain is varied by  Figure4
Option A:	varying the value of resistor R_1
Option B:	varying the value of resistor R_2
Option C:	varying the value of resistor R_3
Option D:	varying the value of resistor R_G

Q2 **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	Draw and explain the control valve characteristics.
B	A sensor outputs a voltage from -2.4 V to -1.11 V. For interface to an analog to digital converter, this needs to be 0 to 2.5 V. Develop the required signal conditioning circuit.
C	What do you mean by tuning of PID controller? List the methods used for tuning. Explain any one in detail.
Q3. **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	Prepare the physical ladder diagram for control problem of following figure5. The global objective is to heat the liquid to specific temperature and keep there for 30 min The hardware has following characteristics: 1 Fill the tank 2 Heat and stir the liquid to the temperature setpoint and hold for 30 min 3 Empty the tank 4 Repeat from step1

	 Figure5
B	Draw the block diagram of generalized data acquisition system and explain. State the objectives of DAS
C	Write short note on virtual instrumentation and instrumentation standard ISA S84.01

University of Mumbai

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Examination: BE Semester VII

Course Code: ELX701 Course Name: Instrumentation System Design

Time: 2 hour Max. Marks: 80

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Q1:

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

Important steps and final answer for the questions involving numerical example

Q2(A):

Explanation of linear, quick opening and equal percentage characteristics with neat diagram

Q2(B):

Solution:

No information is provided about the measured variable and sensor. Hence first step need not be considered

Only signal conditioning circuit is to be designed

Output of the sensor is given to A/D converter. Therefore voltage to voltage conversion is to be provided

Source impedance is not given. Assume it to be very high to avoid loading.

Output impedance of op-amp is very low. Hence no loading of A/D converter.

$$Vout = m.Vin + V_0$$

With given data

$$0 = -2.4m + V_0$$

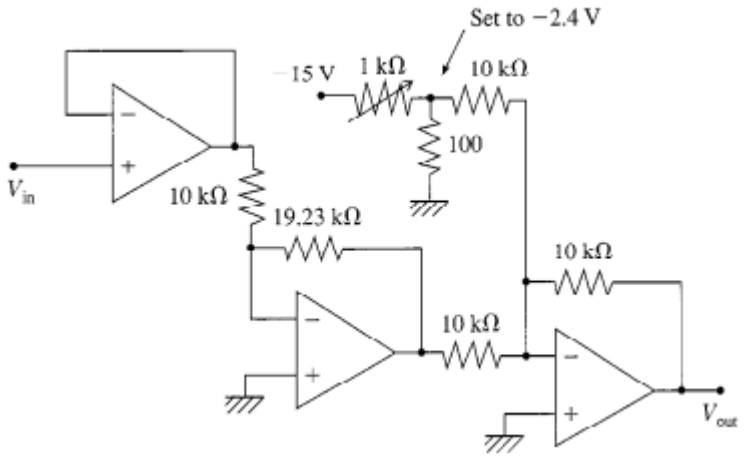
$$2.5 = -1.1m + V_0$$

This gives $m = 1.923$

Therefore $Vout = 1.923.Vin + 4.615$

There are many ways to satisfy this equation.

One of the circuit is shown below



A 15V supply is assumed for voltage divider.100 Ohm resistor keeps loading small. A trimmer resistor is used therefore both loading of the divider by op-amp and variation of supply from exactly 15V is compensated until the bias is exactly 2.4V

Another circuit can be drawn using differential amplifier of gain 1.923 and one input fixed at 2.4V

Q2(C)

Adjustment of *Kp*, *Ki* and K_D

Methods:

Open loop transient response method

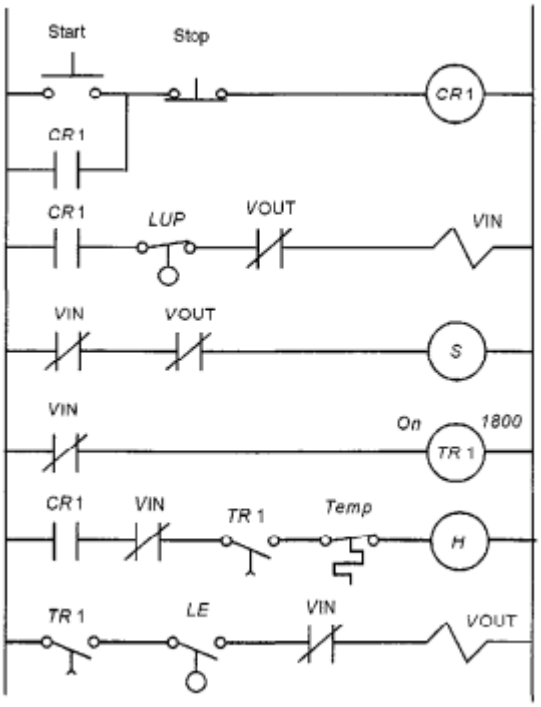
Zigler-Nichol's method

Frequency response method

Explanation of any one method

Q3(A)

Ladder diagram for the problem



Explanation

Input valve open using rung 2 provided output valve closed

When full level reached, stir started by rung 3 provided output valve closed

30 min delay by timer rung 4

Rung 5 energized and de-energized depending on temperature

After timer out, rung 6 opens output valve and remains open until empty limit switch opens.

The output valve cannot be opened until input valve is open.

Q3(B)

Block diagram of generalized DAS

Explanation

Objectives

Q3(C)

Virtual instrumentation

Instrumentation standard ISA S84.01

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 7th January 2021 -20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: R2016

Examination: BE Semester: VII

Course Code: ELX702 and Course Name: POWER ELECTRONICS

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The relation between the forward breakover voltage (VBO) and reverse break down voltage(VRBD) for a given SCR is
Option A:	(VBO) < (VRBD)
Option B:	(VBO) > (VRBD)
Option C:	(VBO) ≈ (VRBD)
Option D:	No relation between (VBO) and (VRBD)
2.	IGBT is made by combining features of
Option A:	BJT and MOSFET
Option B:	SCR and MOSFET
Option C:	BJT and SCR
Option D:	TRIAC and BJT
3.	The gate recovery time of an SCR
Option A:	Can be reduced by increasing reverse voltage across SCR
Option B:	Can be reduced by decreasing reverse voltage across SCR
Option C:	Is independent of applied voltage across SCR
Option D:	Can be reduced by increasing the pulse width of gate pulse
4.	Which of the following is not a voltage controlled device.
Option A:	FET
Option B:	MOSFET
Option C:	IGBT
Option D:	GTO
5.	IGBT can be turned off by
Option A:	Applying a reverse voltage across IGBT
Option B:	Applying a small negative gate current
Option C:	Applying reverse gate current proportional to load current
Option D:	Applying a reverse gate voltage
6.	Which of the following is not true for TRIAC
Option A:	It is bidirectional
Option B:	It works in four quadrants

Option C:	It is suitable for resistive loads
Option D:	It is equivalent to anti-parallel SCRs.
7.	Which of the following is not a method to turn ON the SCR
Option A:	Increasing di/dt
Option B:	Increasing dv/dt
Option C:	Increasing forward voltage across anode cathode
Option D:	Increasing the junction temperature
8.	In a rectifier feeding inductive load, the extinction angle of SCR depends upon
Option A:	Firing angle of SCR
Option B:	Ratio of wL/R
Option C:	Supply voltage of rectifier
Option D:	Type of SCR
9.	The nature of supply current for a single phase fully controlled rectifier feeding highly inductive load is
Option A:	Pure sinusoidal alternating
Option B:	Rectangular alternating
Option C:	Pure dc
Option D:	Depends upon firing angle
10.	In a single phase symmetric semi-converter
Option A:	SCRs only will conduct
Option B:	SCRs and diodes conduct for equal duration
Option C:	SCRs and diodes conduct for unequal duration
Option D:	Diodes only will conduct
11.	Which of the following is not a factor for determining the effect of source inductance
Option A:	Strength of triggering signal
Option B:	Firing angle
Option C:	Load impedance
Option D:	Supply voltage
12.	The advantage of semi-converter over full converter is
Option A:	Improved output current
Option B:	Improved supply current
Option C:	Improved power factor
Option D:	Can work in two quadrants
13.	The maximum output frequency of a simple series inverter is_____, where ω= ringing frequency of the circuit
Option A:	$\omega/2\pi$
Option B:	$2\pi/\omega$
Option C:	$2\pi\omega$
Option D:	$1/2\pi\omega$
14.	What is the draw back of full bridge inverter

Option A:	Uses 3 terminal dc supply
Option B:	Output frequency is not controllable
Option C:	Output voltage is rectangular
Option D:	Input current is sinusoidal
15.	In a pulse width modulated inverter, as the number of pulses increase
Option A:	Lower order harmonics increase
Option B:	Lower order harmonics decrease
Option C:	Higher order harmonics increase
Option D:	Higher order harmonics decrease
16.	In voltage commutated chopper
Option A:	Applied voltage is reversed to commutate the SCR
Option B:	Inductor capacitor combination is used to commutate the SCR
Option C:	Charged capacitor is used to commutate the SCR
Option D:	Charged inductor is used to commutate the SCR
17.	The commutating components in a Jone's chopper circuit are C=25 µf, L1 = L2= 50 µH. If supply voltage is 200V, the highest permissible turn-off time of SCR will be
Option A:	0.35 µsec
Option B:	35.35 µsec
Option C:	3.35 sec
Option D:	3.535 µsec
18.	The expression for output voltage , when D is the duty cycle and V the supply voltage, of a Buck-Boost converter is
Option A:	DV
Option B:	[D/(1-D)]V
Option C:	[(1-D)/D]V
Option D:	V/(1-D)
19.	Which of the following circuits does not have a continuous supply current
Option A:	Fully controlled rectifier with highly inductive load
Option B:	Cuk converter
Option C:	Boost converter
Option D:	Buck converter
20.	In a cyclo-converter the output frequency of is not possible
Option A:	f/5
Option B:	f
Option C:	2f
Option D:	f/2

Q2 **(20 Marks)**	**Solve any Four out of Six** **5 marks each**
A	Explain the working of single-phase half bridge inverter

B	Explain with the help of circuit and waveform, the effect of source inductance on a single phase fully controlled rectifier
C	Explain class-C commutation circuit with the help of circuit diagram and waveforms.
D	Explain the dynamic characteristic of SCR dring turn ON
E	Compare SCR, GTO and IGBT
F	Derive the expression for Buck-Boost converter using circuit and waveforms.

Q3. **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	Explain battery charging circuit with the help of circuit diagram
B	Explain the ac phase control circuit using TRIAC-DIAC with the help of circuit diagram and wave forms
C	Explain ramp and pedestal triggering circuit with the help of circuit. Draw relevant waveforms

University of Mumbai
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Program: **Electronics Engineering**

Curriculum Scheme: R 2016

Examination: BE Semester: VII

Course Code: ELX702 and Course Name: POWER ELECTRONICS

Time: 2 hour Max. Marks: 80

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Q1:

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

Important steps and final answer for the questions involving numerical example

Q2(A):

University of Mumbai

Examination 2020 under Cluster 06

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

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX703 and Course Name: Digital Signal Processing

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Find out DFT of the sequence x(n)= {0,1,2,3}?
Option A:	X(k)= {6, -2+2j, -2, -2-2j}
Option B:	X(k)= {2, -2+2j, -2, -2-2j}
Option C:	X(k)= {1, -2+2j, 2, -2-2j}
Option D:	X(k)= {4, -2+2j, -2, -2-2j}
2.	For N bit DFT calculation no of additions and multiplications by matrix method
Option A:	Additions 2N and multiplications N^2
Option B:	Additions N(N-1) and multiplications N^2
Option C:	Additions N(N-1) and multiplications 2N
Option D:	Additions N(N-1) and multiplications N(N-1)
3.	$x1(n) \circledast x2(n) = X1(k)X2(k)$ What is the property shown for the above equation?
Option A:	Convolution in time domain is convolution in frequency domain
Option B:	Multiplication in time domain is multiplication in frequency domain
Option C:	Convolution in time domain is multiplication in frequency domain
Option D:	Multiplication in time domain is convolution in frequency domain
4.	If DFT of x(n) is X(k) Then DFT of $x_1(n)=x(n-3)$ is $e^{(-j\,2\pi\,n\,l)/N}$ X(k)
Option A:	The value of *l* is 1.
Option B:	The value of *l* is 2.
Option C:	The value of *l* is 3.
Option D:	The value of *l* is 0.
5.	$W_N = e^{-j2\pi/N}$ The term in the equation is called: -
Option A:	twiddle factor
Option B:	ripple factor
Option C:	sigma factor
Option D:	summation factor

6.	$\frac{1}{s-p_i} \rightarrow \frac{1}{1-e^{p_i T} z^{-1}}$ The above relation between s domain and z domain is
Option A:	Bilinear Transformation
Option B:	Impulse Invariance Technique
Option C:	Butter worth filter design
Option D:	Chebyshev Filter design
7.	$\omega = 2\tan^{-1}\frac{\Omega T}{2}$ The above is the relation between digital frequency and analog frequency. What is conversion type?
Option A:	Butter worth Filter Design
Option B:	Impulse Invariance Technique
Option C:	Bilinear Transformation
Option D:	Chebyshev filter design
8.	What is the order of the butter worth filter if the value of $\delta_{2=}0.2$, $\delta_{1=}0.9$ also $\Omega_2/\Omega_1=2.414$?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
9.	By analog frequency transformation convert low pass filter H(s)=1/(s+1) with cut off frequency 1 rad/sec to a low pass filter of 4 rad/sec
Option A:	1/(s+4)
Option B:	4/(s+4)
Option C:	4/(s+1)
Option D:	1/(s+1)
10.	FIR Filters are _____.
Option A:	non recursive structures
Option B:	recursive structures
Option C:	infinite impulse structures
Option D:	Interactive filter
11.	Which of the following condition should the unit sample response of a FIR symmetric filter satisfy to have a linear phase when M is length of the filter?
Option A:	h(n)=h(M-1-n) n=0,1,2…M-1
Option B:	h(n)=±h(M-1-n) n=0,1,2…M-1
Option C:	h(n)=-h(M-1-n) n=0,1,2…M-1
Option D:	h(n)=h(M-1)
12.	FIR stands for: -
Option A:	Finite Impulse Response
Option B:	Final Impulse Response

Option C:	Formatted Infinite Response
Option D:	Formatted Impulse Response
13.	Bartlett Window is also called as
Option A:	Rectangular Window
Option B:	Black Mann Window
Option C:	Triangular Window
Option D:	Hamming Window
14.	Limit cycle oscillations occur only in:-
Option A:	Recursive systems
Option B:	Non-recursive systems
Option C:	FIR Filters
Option D:	Reversive systems
15.	When a system output enters the limit cycle oscillation zone and continues to show the periodic oscillations even after the input is made 0, it is known as the
Option A:	Overflow limit cycle oscillations
Option B:	Truncation
Option C:	Round off
Option D:	Zero limit cycle oscillations
16.	What is the process of converting a signal from a given rate to a different rate?
Option A:	Sampling
Option B:	Normalizing
Option C:	Sampling rate conversion
Option D:	rate conversion
17.	What is the process of reducing the sampling rate by a factor D?
Option A:	Sampling rate conversion
Option B:	Interpolation
Option C:	Decimation
Option D:	formatting
18.	What is the folding frequency for the aliased version of x(n) with sampling rate F?
Option A:	F/D
Option B:	F/4D
Option C:	F/2
Option D:	F/2D
19.	VLIW stands for?
Option A:	Very large Instruction Width
Option B:	Very Large Instruction Word
Option C:	Very Long Instruction Width
Option D:	Very Long Instruction Word
20.	Which type of architecture uses different storage space for program code and the data?
Option A:	Von Neumann architecture

Option B:	Harvard architecture
Option C:	Fragmented architecture
Option D:	Split cell architecture

Q2. **(20 Marks Each)**	
A	Solve any Two 5 marks each
i.	Find DFT of the signal x(n)= {1,2,1,2} by DIT FFT Method?
ii.	What is Pre-Warping effect showing the relation between analog frequency and digital frequency in Bilinear Transformation?
iii.	What are limit cycles in IIR Filter?
B	Solve any One 10 mark each
i.	A low-pass filter is to be designed with the following desired frequency response $H_d(e^{iw}) = \begin{cases} e^{-2jw} & -\Pi/4 \le w \le \Pi/4 \\ 0 & \Pi/4 \le w \le \Pi \end{cases}$ Determine filter coefficients h (n) if the window function is defined as $w(n) = \begin{cases} 1 & 0 \le n \le 4 \\ 0 & otherwise \end{cases}$
ii.	What is the polyphase implementation of Filters?

Q3. (20 Marks Each)	
A	Solve any Two 5 marks each
i.	What is the use of DSP Processors in Real world applications?
ii.	What are windowing techniques in FIR Filter?
iii.	Explain in detail Coefficient Quantization Error?
B	Solve any One 10 marks each
i.	Find DFT of the 8-point sequence x(n)= {1,1,1,1,1,1,1,0} using DIT FFT technique.
ii.	Determine the order and poles of lowpass Butterworth filter that has a 3db attenuation at 500 Hz and 40 db attenuation at 1000Hz

University of Mumbai

Examination 2020 under Cluster 06

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

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELX 703 and Course Name: Digital Signal Processing

Time: 2 hour Max. Marks: 80

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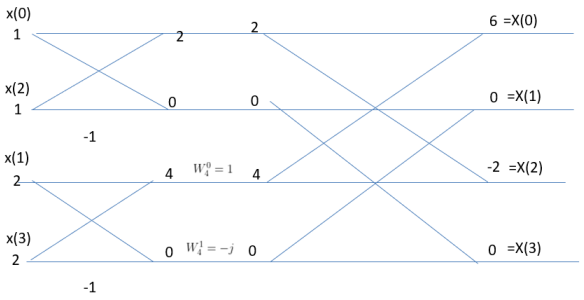
Q1:

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

Important steps and final answer for the questions involving



Numerical example

Q3(B):ii)

Solution Given $\Omega_p = \Omega_1 = 2\pi \times 500 = 1000\pi$ rad/s

$\Omega_s = \Omega_2 = 2\pi \times 1000 = 2000\pi$ rad/

$\alpha_p = 3 = -20 \log \delta_1$

Therefore, $\delta_1 = 0.707$

$\alpha_s = 40 = -20 \log \delta_2$

Therefore, $\delta_2 = 0.01$

$$N \geq \frac{1}{2} \frac{\log\left\{\frac{\left(\frac{1}{\delta_2^2}\right)-1}{\left(\frac{1}{\delta_1^2}\right)-1}\right\}}{\log\left(\frac{\Omega_2}{\Omega_1}\right)} \geq \frac{1}{2} \frac{\log\left(\frac{9999}{1}\right)}{\log\left(\frac{2000\pi}{1000\pi}\right)} \geq 6.644$$

Hence, $N = 7$

The normalised poles are obtained as

$$s_n = je^{j(2n-1)\frac{\pi}{2N}} n = 1,2,...N$$

Substituting $n = 1, 2, 3, 4, 5, 6, 7$, we get

$$s_1 = je^{j\pi/14} = -0.2225 + j0.975$$
$$s_2 = je^{j3\pi/14} = -0.6234 + j0.7818$$
$$s_3 = je^{j5\pi/14} = -0.9009 + j0.4339$$
$$s_4 = je^{j7\pi/14} = -1$$
$$s_5 = je^{j9\pi/14} = -0.9009 - j0.4339$$
$$s_6 = je^{j11\pi/14} = -0.6234 - j0.7818$$
$$s_7 = je^{j13\pi/14} = -0.2225 - j0.975$$

Q2 Bi)

$$h_d(n) = \frac{1}{2\pi}\int_{-\pi}^{\pi} H_d(e^{j\omega})e^{j\omega n}\,\mathrm{d}\omega$$

$$= \frac{1}{2\pi}\int_{-\pi/4}^{\pi/4} e^{-j2\omega}e^{j\omega n}\,\mathrm{d}\omega = \frac{1}{2\pi}\int_{-\pi/4}^{\pi/4} e^{j\omega(n-2)}\,\mathrm{d}\omega$$

$$= \frac{1}{\pi(n-2)}\left[\frac{e^{j(n-2)\pi/4} - e^{-j(n-2)\pi/4}}{2j}\right] = \frac{1}{\pi(n-2)}\sin\frac{\pi}{4}(n-2), \quad n \neq 2$$

For $n = 2$, the filter coefficient can be obtained by applying L'Hospital's rule to the above expre

Thus, $h_d(2) = \frac{1}{4}$

The other filter coefficients are given by

$$h_d(0) = \frac{1}{2\pi} = h_d(4) \quad \text{and} \quad h_d(1) = \frac{1}{\sqrt{2}\pi} = h_d(3)$$

The filter coefficients of the filter would be then

$$h(n) = h_d(n).w(n)$$

Therefore,

$$h(0) = \frac{1}{2\pi} = h(4), \quad h(1) = \frac{1}{\sqrt{2}\pi} = h(3) \quad \text{and} \quad h(2) = \frac{1}{4}$$

Q3Bi) DIT-FFT algorithm

First stage output = {2,0,2,0,2,0,1,1}

Second stage output = {4,0,0,0,3,-j,1,j}

Third stage output, X (K) =
{7, -0.707-j0.707, -j, 0.707- j0.707, 1,
0.707+ j0.707, j, -0.707 + j0.707}

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev2016

Examination: BESemesterVII

Course Code: ELXDLO7031and Course Name: Neural Network and Fuzzy Logic

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Equation v=M[x] in associative memory model, mapping performed on a key vector x is called
Option A:	recording
Option B:	retrieval
Option C:	storage
Option D:	operator
2.	Bidirectional associative memory is a
Option A:	Heteroassociative content addressable memory consisting of 2 layers
Option B:	auto associative not content addressable memory consisting of 2 layers
Option C:	Heteroassociative content addressable memory consisting of 4 layers
Option D:	Heteroassociative consisting of 5 layers
3.	Recovery of an undistorted prototype vector in response to the distorted prototype key vector is called
Option A:	Heteroassociative memory
Option B:	Autoassociative memory
Option C:	storage memory
Option D:	current memory
4.	Delta learning rule works with
Option A:	Binary perceptron
Option B:	Continuous perceptron
Option C:	Stochastic perceptron
Option D:	Binary and stochastic perceptron
5.	What is effect of learning rate on convergence of the Back-Propagation Network.
Option A:	Large value speed the convergence but overshoot may occur
Option B:	Large value speed the convergence but undershoot may occur
Option C:	Small value speed the convergence but overshoot may occur
Option D:	Small value speed the convergence but oscillations may occur
6.	Discrete Hopfield network is a_____ .
Option A:	Single layer feedback network

Option B:	Single layer feedforward network
Option C:	Multi-layer feedforward network
Option D:	Hetero associative memory network
7.	A two-layer network is to have four inputs and six outputs. Hidden layer neurons are 5. The range of the outputs is to be continuous between 0 and 1. What can you tell about the network architecture? Specifically, (i) How many neurons are required in output layer? (ii) What kinds of transfer functions can be used in each layer?
Option A:	(i) 5 (ii) binary
Option B:	(i) 6 (ii) continuous unipolar
Option C:	(i) 4 (ii) binary unipolar
Option D:	(i) 5 (ii) stochastic
8.	Self-Organising Feature Maps are principally: (i) For function approximation (ii) For memory association (iii) For classification
Option A:	i, ii, iii
Option B:	i
Option C:	ii , iii
Option D:	iii
9.	Fuzzy logic has rapidly become one of the most successful of today's technologies for developing sophisticated control systems. The reason for this is: i. Fuzzy logic resembles the human way of thinking. ii. Fuzzy logic enables the ability to generate precise solutions from certain or approximate information. iii. Fuzzy logic is easy to implement.
Option A:	i, ii & iii
Option B:	i,& ii only
Option C:	i, & iii only
Option D:	ii & iii
10.	In associative memory recall pattern , performance measure called degree of similarity is often computed as
Option A:	Binary code
Option B:	Hamming code
Option C:	Primary code
Option D:	Secondary code
11.	The region of universe that is characterized by complete membership in the set is called
Option A:	Core
Option B:	Support

Option C:	Boundary
Option D:	Fuzzy
12.	The equation given below designates to which fuzzy set operation? $\mu(x) = max(\mu A(x), \mu B(x))$
Option A:	Union
Option B:	Intersection
Option C:	Complement
Option D:	Difference
13.	Error correction learning is type of ?
Option A:	supervised learning
Option B:	unsupervised learning
Option C:	can be both supervised or unsupervised
Option D:	competitive learning
14.	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
15.	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
16.	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
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.	Which activation function is represented by following equation? $f(x) = \{1,\ x \geq \theta\ 0,\ x < \theta$
Option A:	Identity function
Option B:	Bipolar Binary Step function
Option C:	Unipolar binary step function
Option D:	tan function

19.	The main advantage of a continuous activation function is that:
Option A:	The activation function is differentiable
Option B:	The output range is restricted to (±1)
Option C:	Unsupervised learning can be used
Option D:	Supervised learning can be used
20.	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

Q2	**Solve any Two Questions out of Three 10 marks each**
A	Design a perceptron rule to implement logical AND function. Use bipolarinputs and output.
B	Explain Why XOR problem cannot be solved by a single layer perceptron and how it is solved by a Multilayer Perceptron.
C	Explain in detail Autoassociative and HeteroAssociative memory model with appropriate examples. Also mention differences between these two models.

Q3.	**Solve any Two Questions out of Three 10 marks each**
A	Design fuzzy controller for washing machine where input is dirt and grease and output is wash time.Use triangular membership function. Four descriptors for every variable. Use five to six rules and appropriate de fuzzification method.
B	What are the salient features of Kohonen'sself-organizing learning algorithm?
C	Explain in detail error back propagation training algorithm.

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examination Commencing from 07th January 2021 to 20th January 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.	B
Q2.	A
Q3.	B
Q4	B
Q5	A
Q6	A
Q7	B
Q8.	A
Q9.	B
Q10.	B
Q11.	A
Q12.	A
Q13.	A
Q14.	C
Q15.	B
Q16.	C
Q17.	B
Q18.	C
Q19.	A
Q20.	B

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

Program: **Electronics Engineering**

Curriculum Scheme: 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.	In WLANs, the hidden station causes collision problem and the solution to this problem is implemented by _____.
Option A:	DIFS
Option B:	RTS-CTS pair of packets
Option C:	Random exponential backoff
Option D:	Network Allocation Vector (NAV)
2.	A virtual connection in Asynchronous Transfer Mode (ATM) is identified by_____.
Option A:	2 VPIs
Option B:	A TPI and A VPI
Option C:	A TPI and A VCI
Option D:	A VCI and A VPI
3.	Which of the following field in ATM cell header format is used for congestion control?
Option A:	Virtual Path Identifier (VPI)
Option B:	Generic Flow Control (GFC)
Option C:	Cell Loss Priority (CLP)
Option D:	Payload Type (PT)
4.	Inquiry is run by one Bluetooth device to _____.
Option A:	To form a connection with another device
Option B:	Discover other devices nearer it
Option C:	Participate in the network
Option D:	Isolate from the network
5.	Which of the following does not contribute to routing in Zigbee network?
Option A:	Coordinator
Option B:	Controller
Option C:	End device
Option D:	Router

6.	Each sensor node consists of four basic components, which component is not a part on sensor node?
Option A:	Sensing Unit
Option B:	A Processing Unit
Option C:	A Power Unit
Option D:	Base Station
7.	Bluetooth is a technology with_____.
Option A:	Half duplex links
Option B:	Full duplex links
Option C:	Both Full duplex and Half duplex links
Option D:	Simplex links
8.	The path layer in SONET connects which of these devices?
Option A:	Add Drop Multiplexer (ADM) to multiplexer
Option B:	ADM to de multiplexer
Option C:	Regenerator to ADM
Option D:	STS Multiplexer to STS demultiplexer
9.	Which of the following is not an advantage of Dense Wavelength Division Multiplexing (DWDM)?
Option A:	Capacity increase
Option B:	Flexibility
Option C:	Cost effective for low channel numbers
Option D:	Network transparency
10.	_____is a device that is used by telecommunication carriers to switch high speed carrier in a fiber optic network.
Option A:	Optical Cross Connect (OXC)
Option B:	Electrical Cross Connect
Option C:	Cross Cells Switch
Option D:	Cross Communication Switch
11.	Which of the following statements are true about core layer in 3 tier Network design? Statements: I. Core layer transport the data from one network to another network II. Core layer is responsible for speed and reliability of a network III. Core layer is responsible for routing and filtering of packets
Option A:	Statement I and Statement III are true
Option B:	Statement I and Statement II are true
Option C:	Statement II and Statement III are true
Option D:	Statement I, Statement II and Statement III are true

12.	Which of the following is not a goal of Remote Network Monitoring (RMON)?
Option A:	Monitoring subnetwork-wide behavior while reducing the burden on agents and managers
Option B:	Proactive monitoring
Option C:	Support single manager
Option D:	Provide value-added data
13.	Which of the following is not a benefit of ubiquitous computing ?
Option A:	The creation of smart products that are connected
Option B:	Non Convergence
Option C:	Use of inexpensive processors
Option D:	Capturing of real-time attributes
14.	Proxy firewall filters are_____.
Option A:	Application/Protocol specific
Option B:	Incoming and outgoing IP packet specific
Option C:	State of data flow specific
Option D:	TCP/IP session specific
15.	Simple Network Management Protocol (SNMP) uses the services of User Datagram Protocol (UDP) on two well known ports, Which of the following UDP port is used by the client (SNMP manager)?
Option A:	UDP port 168
Option B:	UDP Port 162
Option C:	UDP Port 161
Option D:	UDP Port 160
16.	For purposes of routing, the Internet is divided into many areas.
Option A:	Wide area networks
Option B:	Local area networks
Option C:	Autonomous systems
Option D:	Autonomous networks
17.	Routers with RIPv1 implementation exchange their routing tables with neighboring routers by_____packet.
Option A:	Request
Option B:	Advertisement
Option C:	Acknowledgement
Option D:	Echo
18.	A network with Open Shortest Path First (OSPF) protocol can be divided into areas. Which of the following is not a special area type?
Option A:	Stub area
Option B:	Transit area
Option C:	Backbone area
Option D:	Network system area

19.	What is the cloud computing?
Option A:	A way to organize desktop computer
Option B:	Computing resources that can be accessed on demand
Option C:	Light weight software that take up little space on a hard drive
Option D:	The World Wide Web
20.	Eucalyptus (The Eucalyptus Open source Cloud-computing System), Amazon EC2, Rackspace, Nimbus are the examples of_____.
Option A:	Platform as a service
Option B:	Hardware as a service
Option C:	Infrastructure as a service
Option D:	Software as a service

Q2. (20 Marks Each)	**Solve any Four out of Six 5 marks each**
A	Explain Medium Access Control (MAC) sub-layers and MAC frame format.
B	Sketch and explain how network connection is established in Bluetooth?
C	Explain the 3 tier Network design layers: Application layer, Backbone layer and Access layer.
D	Write a Short note on Border Gateway Protocol (BGP) routing protocol.
E	Explain the WPAN 802.15.4 architecture and its Network topology.
F	Explain the SONET hardware components along with its functional layers.

Q3. (20 Marks Each)	**Solve any Four out of Six 5 marks each**
A	Explain Wireless Sensor Network (WSN) protocol stack. What are the applications of WSN?
B	Write in detail about Simple Network Management Protocol (SNMP).
C	Why firewall is required in a network security? Discuss any one type of firewall along with its advantages and limitations.
D	Explain Intradomain and Interdomain Routing? Describe working of Routing Information Protocol (RIP).
E	What is ATM? Draw and Explain cell format and header format.
F	What is cloud computing? Differentiate between various cloud deployment models.

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

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7032 Course Name: Advance Networking Technologies

Time: 2 hour Max. Marks: 80

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Q1:

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

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

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.	Select correct type of robot configuration based on given order: (x,y,z), (r, θ, φ), (r, θ, z)
Option A:	Cartesian, Cylindrical, Spherical
Option B:	Cartesian, Spherical, Cylindrical
Option C:	Spherical, Cartesian, Cylindrical
Option D:	Spherical, Cylindrical, Cartesian
2.	<table><tr><td>Cθ</td><td>- Sθ</td><td>0</td></tr><tr><td>Sθ</td><td>Cθ</td><td>0</td></tr><tr><td>0</td><td>0</td><td>1</td></tr></table> The above matrix denotes…
Option A:	Second fundamental rotation
Option B:	First fundamental rotation
Option C:	Third fundamental rotation
Option D:	Second fundamental translation
3.	A measure of spatial resolution with which the tool tip can be placed within the work space envelope of the robot is called as _____ .
Option A:	Accuracy
Option B:	Precision
Option C:	Repeatability
Option D:	Resolution
4.	A pair of points p1=[1,2,1]T and p2=[2,3,4]T are to be translated along X and Z axes by 3 and -2 respectively. Determine their new position.
Option A:	$[1,3,2,1]^T$
Option B:	$[5,2,3,1]^T$
Option C:	$[1,5,3,1]^T$
Option D:	$[5,3,2,1]^T$
5.	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 robotics joint angles

6.	Jacobian matrix ....
Option A:	relates Cartesian velocity of a manipulator with its joint velocity.
Option B:	cannot be used to control a manipulator
Option C:	cannot be used to check singularity of a manipulator
Option D:	is used to determine the joint torques and forces.
7.	Piecewise Linear Interpolation with Parabolic Blends is which type of motion?
Option A:	Pick and Place Trajectory
Option B:	Continuous Path Trajectory
Option C:	Straight Line Trajectory
Option D:	Point to Point Trajectory
8.	What is the correct order for image representation while converting from analog to digital image?
Option A:	Sampling, Quantizing, Coding
Option B:	Sampling, Quantizing, Packing
Option C:	Coding, Sampling, Quantizing
Option D:	Coding, Sampling, Packing
9.	Performance Index method and Normalized Cross Correlation method are used for .....
Option A:	Sampling
Option B:	Template Matching
Option C:	Segmentation
Option D:	Edge detection
10.	Powered lead through method and Manual lead through method are used for .....
Option A:	Trajectory Programming
Option B:	Task Level Programming
Option C:	Image representation
Option D:	Straight line motion programming
11.	Uncertainty is of two types; and .
Option A:	acceleration, velocity
Option B:	acceleration, position
Option C:	velocity, position
Option D:	rotation, position
12.	If K denotes kinetic energy of a system and P denotes potential energy, then the 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
13.	Joint space trajectory planning involves …..
Option A:	3rd order polynomial trajectory and 5th order polynomial trajectory planning
Option B:	Only 3rd order polynomial trajectory planning
Option C:	Only 5th order polynomial trajectory planning

Option D:	Cartesian space trajectory planning
14.	Differential motion of a frame can be denoted by ….
Option A:	Differential translations
Option B:	Differential translations and differential rotations
Option C:	Differential rotations
Option D:	Differential Cartesian motions
15.	The orientation of the tool is expressed in rectangular coordinates by a rotation matrix R = [r^1 , r^2, r^3], where the three columns of R corresponds to ……. in that order.
Option A:	Normal, Sliding and Approach vectors
Option B:	Sliding, Normal and Approach vectors
Option C:	Position, perspective and scaling vectors
Option D:	Normal, Scaling and Approach vectors
16.	Edge detection algorithm uses ….
Option A:	Line descriptors
Option B:	Intensity gradient
Option C:	Area descriptors
Option D:	Chain coding
17.	GVD is used for …….
Option A:	Fine motion planning
Option B:	Grasp motion planning
Option C:	Gross motion planning
Option D:	Motion planning with parabolic blends
18.	_____ is used to calculate the differential motions needed at the joints of the robot for a desired hand differential motion.
Option A:	Jacobian
Option B:	Lagrangian
Option C:	Inverse Jacobian
Option D:	TCV
19.	P = [2,1,3]T, rotate the frame about Z axis by 30 degree and then about Y axis by 30 degree. Find the new co-ordinate wrt fixed frame.
Option A:	[2.567, 1.982, 1.866]
Option B:	[2.567, 1.866,1.982]
Option C:	[1.384, 2.232, 2.665]
Option D:	[1.384, 2.665, 2.232]
20.	Find the chain code for given binary image. 0 0 0 0 0 0 1 1 1 0 1 0 0 0 1. 0 1 1 1 0 0 0 0 0 0
Option A:	3,4,4,5,7,7,0,1

Option B:	3,4,5,5,7,0,0,1
Option C:	3,4,4,5,7,0,0,1
Option D:	3,3,3,5,7,7,7,0

Q2	**20 marks**
A	**Solve any Two 5 marks each**
i.	Inverse kinematics is not unique. Justify with minimum two examples.
ii.	Write the use of Shrink and Swell operators.
iii.	What is uncertainty in task planning? Give example.
B	**Solve any One 10 marks each**
i.	Consider an Adept - 1 SCARA robot 4 axes having axes B, E, VE, TR. Write a note on its physical construction. Explain its kinematics. Obtain the solution of the Direct Kinematic Problem.
ii.	With neat diagram explain robot task planner.

Q3.	**20 marks**
A	**Solve any Two 5 marks each**
i.	Using 3rd order polynomial, calculate the joint angle at 1, 2, 3 and 4 seconds for a robot to go from initial angle of 30 degree to 75 degree.
ii.	Explain Cartesian space trajectory with suitable example.
iii.	Explain perspective transformation with neat diagram.
B	**Solve any One 10 marks each**
i.	Explain inverse kinematics solution for a 3 DOF PARA or three-axis articulated coordinate robot.
ii.	Explain programming techniques used for task planning in detail.

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examination Commencing from 7th January 2021 to 20th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2016
Examination: BE Semester VII
Course Code: ELXDLO7033 and Course Name: Robotics
Time: 2 hour Max. Marks: 80

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Q1:

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

Important steps and final answer for the questions involving numerical example

Q3 (A) i:

For a 3rd-order polynomial:

$$\theta(t) = c_0 + c_1 t + c_2 t^2 + c_3 t^3$$
$$\dot{\theta}(t) = c_1 + 2c_2 t + 3c_3 t^2$$

Substitute boundary conditions to get:

$$\theta_i = 50 = c_0 + 0$$
$$\dot{\theta}_i = 0 = c_1 + 0$$
$$\theta_f = 80 = 50 + 9c_2 + 27c_3$$
$$\dot{\theta}_f = 0 = 6c_2 + 27c_3$$

Solve to get:

$$c_0 = 5 \quad c_1 = 0 \quad c_2 = 10 \quad c_3 = -2.222$$
$$\theta(t) = 50 + 10t^2 - 2.222t^3$$
$$\dot{\theta}(t) = 20t - 6.666t^2$$
$$\ddot{\theta}(t) = 20 - 13.332t$$

@t=1 sec $\begin{cases} \theta = 57.78^\circ \\ \dot{\theta} = 13.334\ ^\circ/\text{sec} \\ \ddot{\theta} = 6.668\ ^\circ/\text{sec} \end{cases}$ @t=2 sec $\begin{cases} \theta = 72.22^\circ \\ \dot{\theta} = 13.34\ ^\circ/\text{sec} \\ \ddot{\theta} = -6.664\ ^\circ/\text{sec} \end{cases}$ @t=3 sec $\begin{cases} \theta = 80^\circ \\ \dot{\theta} = 0\ ^\circ/\text{sec} \\ \ddot{\theta} = -20\ ^\circ/\text{sec} \end{cases}$

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7034 and Course Name: Integrated Circuit Technology

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks** (2 marks each)
1.	Missing atom in a crystal structure is _____defect.
Option A:	Vacancy
Option B:	Interstitial
Option C:	Dislocation
Option D:	Stacking fault
2.	CO_2 and O_2 contamination occur more in_____.
Option A:	CZ process
Option B:	FZ Process
Option C:	Bridgeman technique
Option D:	SOI technology
3.	In RCA cleaning, the first solution SC-1 consists of .
Option A:	6 H_2O: 1 H_2O_2: 1 HCl
Option B:	6 H_2O: 1 H_2O_2 : 1 NH_4OH
Option C:	5 H_2O: 1 H_2O_2: 1 NH_4OH
Option D:	5 H_2O: 1 H_2O_2: 1 HCl
4.	In diffusion systems, role of carrier gas is to .
Option A:	Transport vapour from the source
Option B:	Transport vapour to the source
Option C:	Transports vapour to the bubbler
Option D:	Transport vapour to the outlet
5.	Implantation damage is always followed by the _____process.
Option A:	Lithography
Option B:	Diffusion
Option C:	Annealing
Option D:	Oxidation
6.	Which of the following combination gives highest oxide thickness for the same time and temperature?
Option A:	Wet, 110
Option B:	Wet, 111
Option C:	Dry, 100

Option D:	Dry, 111
7.	Oxidation process follows ----------.
Option A:	Linear and Square law
Option B:	parabolic and linear law
Option C:	linear law and exponential law
Option D:	Square law
8.	Which technique is used to create the isolated active areas?
Option A:	Deposition
Option B:	Ion Implantation
Option C:	Diffusion
Option D:	Local Oxidation of Silicon
9.	Which etching process is known as sputtering or ion etching?
Option A:	Dry physical etching
Option B:	Wet chemical etching
Option C:	Dry chemical etching
Option D:	Reactive ion etching
10.	The figure of merit for lithography process is .
Option A:	depth of focus
Option B:	mask generation
Option C:	photoresist
Option D:	contact printing
11.	As per lambda design rules, minimum metal width is _____.
Option A:	2λ
Option B:	6λ
Option C:	1λ
Option D:	3λ
12.	When polysilicon crossed , transistor is formed.
Option A:	metal
Option B:	Gate
Option C:	diffusion
Option D:	polysilicon
13.	Butting contact and the buried contact are used to make connection between and layers.
Option A:	Metal, Polysilicon
Option B:	Polysilicon, Diffusion
Option C:	Metal, Diffusion
Option D:	Metal, Metal
14.	Four probe method is used to measure .
Option A:	carrier concentration
Option B:	electron mobility
Option C:	Resistivity

Option D:	temperature coefficient
15.	Which of the following method is used to determine conductivity of a semiconductor?
Option A:	Hall effect method
Option B:	Hot probe method
Option C:	BTS method
Option D:	Multimeter method
16.	A chip operating in GHz frequency must be tested for_____.
Option A:	Speed
Option B:	fault coverage
Option C:	electromagnetic interference
Option D:	electro-migration
17.	BiCMOS is used in _____.
Option A:	Large resistive loads
Option B:	Light resistive loads
Option C:	Large capacitive loads
Option D:	Light capacitive loads
18.	SIMOX stands for _____.
Option A:	Separation by metal oxygen
Option B:	Silicon metal oxygen
Option C:	Silicon measured oxygen
Option D:	Separation by implanted oxygen
19.	Graphine is _____.
Option A:	zero dimensional material
Option B:	one dimensional material
Option C:	two dimensional material
Option D:	three dimensional material
20.	Which of the following is a multi-Gate device?
Option A:	BJT
Option B:	MODFET
Option C:	FinFET
Option D:	MESFET

Q2	**Solve any Four out of Six** **5 marks each**
A	Enlist the steps for obtaining silicon from sand.
B	What is LOCOS? Why it is required in the CMOS process.
C	Give lambda (λ) design rules for well and polysilicon layer of CMOS process.
D	Explain different configurations for the measurement of minority carrier diffusion length using SEM in EBIC mode.
E	Explain SOI fabrication using SIMOX method.
F	Write short note on black phosphorous.

Q3	Solve any Four out of Six 5 marks each
A	Explain Czochralski method for Silicon crystal growth.
B	Explain Nuclear & Electronic stopping mechanisms with neat diagram.
C	Describe the liquid source diffusion system.
D	Explain the latch-up phenomena with neat diagrams.
E	Explain the steps of lithography with suitable diagrams.
F	Write short note on automatic test equipment.

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **Electronics Engineering**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ELXDLO7034 and Course Name: Integrated Circuit Technology

Time: 2 hour Max. Marks: 80

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Q1:

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

University of Mumbai

Examination 2020 under cluster ALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

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

Time: 2 hour Max. Marks: 80

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

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

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

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

Q3. **(20 Marks)**	**Solve any Two Questions out of Three 10 marks each**
A	*Explain life cycle phases in detail.*

B	*Explain product life cycle strategies in brief.*
C	*Explain various product development tools in detail.*

University of Mumbai

Examination 2020 under clusterALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

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

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster ALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7012 and Course Name: Reliability Engineering

Time: 2 hour Max. Marks: 80

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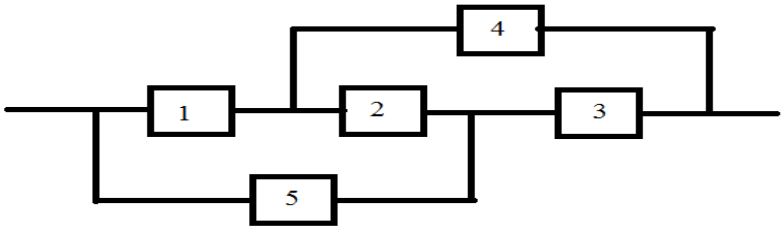
Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	The Bathtub curve indicates failure probability, Which stage is NOT normally associated with the bathtub curve?_____
Option A:	Pulling the plug where production is halted due to unacceptable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

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

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

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

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

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7012 and Course Name: Reliability Engineering

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster 6 (Lead College: VCET)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **ALL**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ILO 7013 and Course Name: Management Information System

Time: 2 hour Max. Marks: 80

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	For any information to be useful, it must be _____
Option A:	Efficient
Option B:	Safe
Option C:	Complete
Option D:	Optimized
2.	Types of information systems include _____
Option A:	Management support system
Option B:	Hardware processing system
Option C:	Output handling systems
Option D:	Storage processing systems
3.	The term **Field** in a data represents ____
Option A:	Integrated collection of logically related data
Option B:	A group of related records
Option C:	Logical structure
Option D:	Data attribute
4.	Functions of a DBMS includes ____
Option A:	Database
Option B:	Datamart
Option C:	Data Warehouse
Option D:	Manipulation of records in a table

5.	Data Mart is a subset of _____
Option A:	Data
Option B:	Data mining
Option C:	Data Warehouse
Option D:	Database
6.	Data mining is not used for _____
Option A:	Day to Day operations
Option B:	Market analysis
Option C:	Customer retention
Option D:	Discover new correlations
7.	Data scrubbing is which of the following?
Option A:	A process to reject data from the data warehouse and to create the necessary indexes
Option B:	A process to load the data in the data warehouse and to create the necessary indexes
Option C:	A process to upgrade the quality of data after it is moved into a data warehouse
Option D:	A process to upgrade the quality of data before it is moved into a data warehouse
8.	The purpose of a copyright is_____
Option A:	closely safeguarded as a secret, or legal protections are lost
Option B:	Information that gives one company a competitive advantage over others
Option C:	Designed to protect the expression of ideas
Option D:	Designed to protect inventions, tangible objects, or ways to make them
9.	_____ is the method of translating an original message into a type that, except for the intended recipient, cannot be interpreted by anyone.

Option A:	Virtual Private Network (VPN)
Option B:	Firewall
Option C:	Secure Socket Layer (SSL)
Option D:	Encryption
10.	The identity of the person who needs access is verified by a process called as ___
Option A:	Authentication
Option B:	Authorization
Option C:	Biometrics
Option D:	Password
11.	Electronic commerce systems generally include all of the following except:
Option A:	Internet websites for online sales
Option B:	Intranets that allow sales reps to access customer records
Option C:	Extranet access of inventory databases
Option D:	Direct links to credit reporting services
12.	Which of the following is incorrect about social computing
Option A:	Combines social behaviour and Information system
Option B:	Encourages and promotes machine-generated information
Option C:	Improves collaboration and interaction among people
Option D:	Produces social information

13.	What allows users to position data in multiple associations that overlap?
Option A:	Tagging
Option B:	Really Simple Syndication
Option C:	AJAX
Option D:	Wikis
14.	Traveling sales people and those at regional sales offices can use the Internet, extranets, and other networks to transmit customer orders from their laptop or desktop PCs, thus breaking barriers.
Option A:	Physical
Option B:	Competition
Option C:	Structural
Option D:	Geographic
15.	Most companies are building e-business and e-commerce websites to achieve all of the following goals except:
Option A:	Generate new revenue from online sales
Option B:	Increase foot traffic at brick and mortar locations
Option C:	Reduce transaction costs
Option D:	Increase the loyalty of existing customers via Web customer service and support
16.	All of the following would typically be supported by an organization's intranet information portal *except*:
Option A:	Communication and collaboration
Option B:	Business operations and management
Option C:	Web publishing
Option D:	Recruitment
17.	The most fundamental information systems in an organization are_____
Option A:	Office automation systems
Option B:	Decision support systems

Option C:	Functional area information systems
Option D:	Transaction processing systems
18.	Which of the following is not an advantage of the buy option for acquiring IS applications?
Option A:	Few types of off-the-shelf software are available, thus limiting confusion.
Option B:	The software can be tried out.
Option C:	The buy option saves time.
Option D:	The company will know what it is getting.
19.	Which of the following systems acquisition methods saves the company's time, enables the company to select software that has been used for similar problems in other organizations, and allows the company to try out the software?
Option A:	Systems development life cycle
Option B:	Prototyping
Option C:	End-user development
Option D:	Buy option
20.	_____ is a method of delivering software in which a vendor hosts the applications and customers access these applications over the Internet.
Option A:	Software-as-a-Service
Option B:	Prototyping
Option C:	Leasing the application
Option D:	Service-oriented architecture

Q2 (20 Marks)	**Solve any Four out of Six 5 marks each**
A	Describe what is meant by knowledge management. What factors have led to its development
B	Explain the importance of data in today's environment with an example
C	With a neat diagram explain the various types of Information systems
D	What is the impact of information system on organization and society
E	Describe the categories of ethical issues related to information technology.
F	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 Four out of Six 5 marks each**
A	Discuss why social computing is so important in customer relationship management?
B	Describe the benefits of social commerce to customers.
C	Describe the most common types of wireless devices.
D	Describe technologies that underline pervasive computing, providing examples of how businesses can utilize them?
E	Compare and contrast the three basic types of reports which are closely associated with FAIS and ERP systems.
F	Describe the four fundamental business decisions that organizations must make when acquiring information systems.

University of Mumbai

Examination 2020 under cluster 6 (Lead College: VCET)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: **ALL**

Curriculum Scheme: Rev 2016

Examination: BE Semester VII

Course Code: ILO 7013 and Course Name: Management Information System

Time: 2 hour Max. Marks: 80

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

University of Mumbai

Examination 2020 under cluster ALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 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

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	The principle used in dealing with controllable nuisance factor is
Option A:	Analysis of covariance
Option B:	Process robustness
Option C:	Blocking
Option D:	Analysis of variance
2.	An independent repeat run of each factor combinations is called
Option A:	Randomization
Option B:	Replication
Option C:	Blocking
Option D:	Repeated measurements
3.	The study which helps one to understand the conditions under which response variables of interest change seriously is _____.
Option A:	Robustness
Option B:	Optimization
Option C:	Randomization
Option D:	replication
4.	Production design and manufacturing personnel being brought together early in the design process is called
Option A:	Robust Design
Option B:	Concurrent Engineering
Option C:	Delayed Diferentiation
Option D:	Forward Engineering
5.	Imagine we conducted a three-way independent ANOVA. How many sources of variance would we have?
Option A:	3
Option B:	7
Option C:	4
Option D:	8
6.	First the main plot treatment and sub plot treatment are usually decided based on the needed _____.
Option A:	Precision
Option B:	Accuracy
Option C:	Results

Option D:	Conclusion
7.	Which of the following statements is true?
Option A:	No more than four factors can be included in a factorial design.
Option B:	The number of factors has no bearing on the interpretation of results.
Option C:	Any number of factors can be included, but interpretation of interactions is more difficult as the number of factors increases.
Option D:	Interactions with up to ten factors can be readily interpreted.
8.	Factorial experiments_____.
Option A:	include two or more dependent variables.
Option B:	include two or more independent variables.
Option C:	focus on unmeasured factors.
Option D:	focus on organismic factors.
9.	The different treatments are allotted at random to their respective plots. Such arrangement is called _____.
Option A:	Unique design
Option B:	Random design
Option C:	Split plot design
Option D:	Parallel design
10.	The factor for which greater _____ is required is assigned to the sub plots.
Option A:	Accuracy
Option B:	Testing
Option C:	Dependance
Option D:	Precision
11.	What information is given in the factorial design notation, 2 X 3 X 2?
Option A:	The design has two independent variables, three dependent variables, and two organismic variables.
Option B:	Interactions will be found.
Option C:	The design has three independent variables, two levels of A, three levels of B, and two levels of C.
Option D:	The design has 12 independent variables.
12.	The design in which no main effects are aliased with any other main effect, or two-factor interactions but two-factor interactions are aliased with three factor interactions are called _____.
Option A:	Resolution IV design
Option B:	Resolution V design
Option C:	Resolution III design
Option D:	Resolution VI design
13.	There are 30 students in each experimental condition in a 5x4 between-groups design, how many participants would be needed in total?
Option A:	600

Option B:	20
Option C:	400
Option D:	30
14.	Designs in which more than one variable are studied simultaneously are called _____ designs.
Option A:	factorial
Option B:	sum of squares
Option C:	two tailed
Option D:	replicate
15.	Which of the following typically generate negative information about which factors do not make a difference in the quality characteristic of interest?
Option A:	sample data sets
Option B:	attribute data sets
Option C:	bad data sets
Option D:	good data sets
16.	A continuous form of data is called as-
Option A:	attribute data
Option B:	variable data
Option C:	discontinuous data
Option D:	sample data
17.	Which name is most closely associated with robust design?
Option A:	Taguchi
Option B:	Ford
Option C:	Smith
Option D:	McGinnis
18.	Which of the following is an example of Taguchi's three level design?
Option A:	L4
Option B:	L8
Option C:	L12
Option D:	L27
19.	The main difference between traditional Design of Experiments and Taguchi's Design of Experiments is -
Option A:	Taguchi's DoE considers average to be more interesting to study than the variation
Option B:	Taguchi's DoE considers statistics to study variation
Option C:	Taguchi's DoE considers attribute data to study variation
Option D:	Taguchi's DoE considers variation to be more interesting to study than the average
20.	A factor with a range of settings, that is controlled by the user during use is called as -
Option A:	random factor
Option B:	robust factor
Option C:	nominal factor

Option D:	signal factor

Q2. **(20 Marks)**	**Solve any Four out of Six** **5 marks each**
A	Write a note on: Classification of Experimental Design
B	Explain factorial design.
C	Explain in short: Randomized Complete Block Design
D	What are the general guidelines for Designing Experiments?
E	Discuss hypothesis testing.
F	Write a note on: Split Plot design

Q3. **(20 Marks)**	**Solve any Two Questions out of Three** **10 marks each**
A	Explain Taguchi's design of experiments
B	Set up an analysis of variance table for the following per acre production data for three varieties of wheat, each grown on 4 plots and state if the variety differences are significant.
C	What are the features of a desirable design when selecting a response surface design?

Plot of land	*Per acre production data*		
	Variety of wheat		
	A	*B*	*C*
1	6	5	5
2	7	5	4
3	3	3	3
4	8	7	4

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 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

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

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

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 hours Max. Marks: 80

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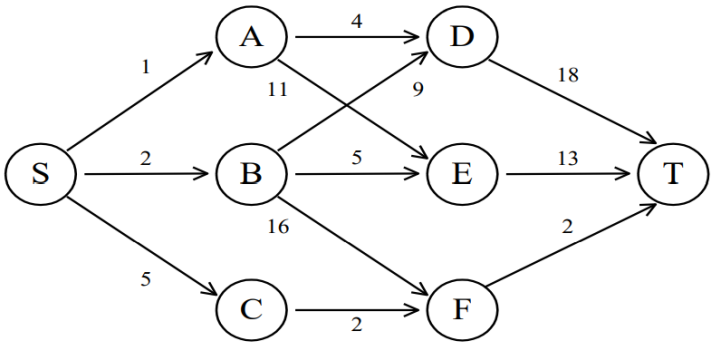
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	At every iteration of Simplex method, for minimization problem, a Variable in the current basis is replaced with another variable that has ----
Option A:	A positive $c_j - z_j$ value
Option B:	A negative $c_j - z_j$ value
Option C:	$c_j - z_j = 0$
Option D:	Any value
2.	If there are more than one optimum solutions for the LPP then this is the case of
Option A:	Unbounded solution
Option B:	Infeasible solution
Option C:	Alternative optima
Option D:	No solution
3.	The solution of the LPP Max. $Z = 15x + 10y$ subject to the constraints $4x + 6y \leq 360$ $3x \leq 180$ $5y \leq 200$ where $x, y \geq 0$ is----------
Option A:	60, 0
Option B:	30, 40
Option C:	60, 20
Option D:	0, 40
4.	Dual of the Dual is
Option A:	Primal
Option B:	Dual
Option C:	Alternative
Option D:	Does not exist
5.	In sensitivity analysis of the coefficient of the non basic variables in cost minimization LP problem , the upper sensitivity limit is----------
Option A:	Original value + lowest positive value of improvement ratio
Option B:	Original value - lowest positive value of improvement ratio
Option C:	Positive infinity
Option D:	Negative infinity

<table>
<tr><td></td><td></td></tr>
<tr><td>6.</td><td>If the constraints of a LPP are not satisfied simultaneously then we conclude that----</td></tr>
<tr><td>Option A:</td><td>The LPP has infinitely many solutions</td></tr>
<tr><td>Option B:</td><td>The LPP has a unique solution</td></tr>
<tr><td>Option C:</td><td>The LPP has an unbounded solution</td></tr>
<tr><td>Option D:</td><td>The LPP has no solution</td></tr>
<tr><td></td><td></td></tr>
<tr><td>7.</td><td>For any Primal problem and its dual---</td></tr>
<tr><td>Option A:</td><td>Optimal value of primal is zero</td></tr>
<tr><td>Option B:</td><td>Primal will have an optimal solution if and only if dual does too</td></tr>
<tr><td>Option C:</td><td>Both primal and dual cannot be infeasible</td></tr>
<tr><td>Option D:</td><td>solution cannot be found from the same simplex table</td></tr>
<tr><td></td><td></td></tr>
<tr><td>8.</td><td>If the arrival and departure rates in a M/M/I queue are 1/2 per minute and 2/3 per minute respectively, find the average waiting time of a customer in the queue.</td></tr>
<tr><td>Option A:</td><td>5 minutes</td></tr>
<tr><td>Option B:</td><td>240 seconds</td></tr>
<tr><td>Option C:</td><td>5.5 minutes</td></tr>
<tr><td>Option D:</td><td>4.5 minutes</td></tr>
<tr><td></td><td></td></tr>
<tr><td>9.</td><td>Customers arrive at a service facility to get the required service. The inter-arrival and service time are constant and are 1.8 1nd 4 minutes respectively. Simulate the system for 14 minutes. The arrival time of customers within 14 minutes period will be:
<table>
<tr><td>Customer</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>Arrival Time (min)</td><td>0</td><td>1.8</td><td>3.6</td><td>5.4</td><td>7.2</td><td>9.0</td><td>10.8</td><td>12.6</td></tr>
</table>
Determine the average waiting time of a customer.</td></tr>
<tr><td>Option A:</td><td>3.7 mins</td></tr>
<tr><td>Option B:</td><td>3.4 mins</td></tr>
<tr><td>Option C:</td><td>4.0 mins</td></tr>
<tr><td>Option D:</td><td>3.0 mins</td></tr>
<tr><td></td><td></td></tr>
<tr><td>10.</td><td>A manual railway reservation system has 2 counters. Customers arrive to buy tickets at a mean rate of 40/hr. A person in each counter requires an average service rate of 15/hr. When both counters are busy, an arriving customer joins a single line to buy the tickets. Identify the type of queuing System.</td></tr>
<tr><td>Option A:</td><td>Single server, Infinite queue length, Finite population</td></tr>
<tr><td>Option B:</td><td>Single server, Infinite queue length, Infinite population</td></tr>
<tr><td>Option C:</td><td>Multiple server, finite queue length, Finite population</td></tr>
<tr><td>Option D:</td><td>Multiple server, Infinite queue length, Infinite population</td></tr>
<tr><td></td><td></td></tr>
<tr><td>11.</td><td>Which of the following is NOT correct?</td></tr>
<tr><td>Option A:</td><td>Basic steps in the use of simulation technique are more or less independent of the nature of the problem</td></tr>
<tr><td>Option B:</td><td>Probability simulation is like random sampling where the output is subject to statistical error</td></tr>
<tr><td>Option C:</td><td>Simulation involves developing a model of some real phenomenon and then experimenting on it</td></tr>
<tr><td>Option D:</td><td>Simulation cannot be used where mathematical techniques can be used</td></tr>
</table>

12.	When the ordering cost is increased to four times, the EOQ will be increased to
Option A:	2 times
Option B:	3 times
Option C:	8 times
Option D:	Remain same
13.	Which of the following is a property of a dynamic programming problem?
Option A:	Optimal substructure
Option B:	Non-Overlapping sub-problems
Option C:	Local Optimal choice
Option D:	The given problem can be reduced to the 3-SAT problem
14.	Which of the following problems is most suitable for a Probabilistic Dynamic problem solving method?
Option A:	Distributing medical teams to countries
Option B:	Scheduling employment levels
Option C:	Winning in Las Vegas
Option D:	Stagecoach problem
15.	What happens when Maximin and Minimax values are the same ?
Option A:	No solution exists
Option B:	Solution is mixed
Option C:	Saddle point exists
Option D:	Saddle point does not exist
16.	The size of the payoff matrix of a game can be reduced by using the principle of
Option A:	Game inversion
Option B:	Rotation reduction
Option C:	Dominance
Option D:	Game transpose
17.	The optimum strategies for each player in the case of strictly determinable games are--- Player B / Player A B1: A1 = 0, A2 = -1 B2: A1 = 2, A2 = 4
Option A:	(A1, B1)
Option B:	(A2, B1)
Option C:	(A1, B2)
Option D:	(A2, B2)
18.	An example of purchasing costs include---
Option A:	Incoming freight
Option B:	Storage costs
Option C:	Insurance
Option D:	Spoilage

19.	The order cost per order of an inventory is Rs. 400 with an annual carrying cost of Rs. 10 per unit. The Economic Order Quantity (EOQ) for an annual demand of 2000 units is-------
Option A:	440
Option B:	480
Option C:	500
Option D:	400
20.	The Economic Order Quantity (EOQ) is calculated as---- Note: D=Annual demand (units), S=Cost per order, h=Annual carrying cost per unit
Option A:	$\sqrt{\frac{(D*S)}{h}}$
Option B:	$\sqrt{\frac{(2D*S)}{h}}$
Option C:	$\sqrt{\frac{(D*S)}{3h}}$
Option D:	$\sqrt{\frac{(D*S)}{2h}}$

Q2. **(20 Marks)**	**Solve any Four out of Six** **5 marks each**
A	Find the saddle point and the best strategy for Player A and Player B. Also find the value of the game. **Player B** **Player A** B_1 B_2 B_3 A_1 15 2 3 A_2 6 5 7 A_3 -7 4 0
B	Write the dual of the following LPP Max Z $=2x_1+9x_2+11x_3$ subject to $x_1 - x_2 + x_3 \geq 3$ $-3x_1 + 2x_3 \leq 1$ $2x_1 + x_2 - 5x_3 = 1$ where $x_1, x_2, x_3 \geq 0$
C	A movie theater has two ticket counters. Customers arrive to buy tickets at a mean rate of 50/hr. A person in each counter requires an average service rate of 30/hr. When both counters are busy, an arriving customer joins a single line to buy the tickets. 1) What is the probability that there is no queue? 2) Determine the length of the queue

D	Neon lights on the ABC campus are replaced at the rate of 100 units per day. The physical plant orders the neon lights periodically. It costs $100 to initiate a purchase order. A neon light kept in storage is estimated to cost about $.02 per day. The lead time between placing and receiving an order is 12 days. Determine the Economic order Quantity (EOQ) of ordering the neon lights and associated cycle length.
E	The automobile Company manufactures around 130 cars. The daily car production varies from 126 to 134. **Production per day** | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 **Probability** | 0.04 | 0.09 | 0.12 | 0.14 | 0.11 | 0.10 | 0.20 | 0.12 | 0.08 The finished cars transported in a lorry with an accommodating capacity of 150 cars using the following random numbers 80, 81, 76, 75, 64, 43, 18, 26, 10, 12, 65, 68, 69, 61, 57 Simulate the following 1)Average number of cars waiting in the factory 2)Average number of empty spaces in the lorry
F	Find an optimal path from S to T for the following stage coach problem using backward recursive approach 

Q3. **(20 Marks)**	**Solve (any Two) Questions out of Three** **10 marks each**
A	Solve the following L.P.P. by Simplex method Max $Z= 4x_1 + 10x_2$ subject to $2x_1+ x_2 \leq 50$ $2x_1 + 5x_2 \leq 100$ $2x_1 + 3x_2 \leq 90$ where $x_1, x_2 \geq 0$

B	A Salesman estimates that the following will be the cost on his route, visiting 5 cities as shown in the table below: **Destination** **Source** |	1	2	3	4	5
---	---	---	---	---	---
1	∞	2	5	7	1
2	6	∞	3	8	2
3	8	7	∞	4	7
4	12	4	6	∞	5
5	1	3	2	8	∞	 The salesman can visit each city only once. Determine the sequence he should follow to minimize the total distance travelled.
C	Find the optimal solution to the transportation problem using the stepping stone method. **Supply** **Demand** 					
---	---	---	---	---
4	6	8	8	**40**
6	8	6	7	**60**
5	7	6	8	**50**
20	**30**	**50**	**50**	

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

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 Max. Marks: 40

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

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

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

Time: 2 hour Max. Marks: 80

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

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

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

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

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

ii.	Explain E-Contracts. Discuss E-Contracts Act 1872.

Q3. **(20 Marks)**	
A	**Solve any Two** **5 marks each**
i.	Explain Bluetooth Hacking with various tools
ii.	Explain Vishing, Phishing and Smishing in Cyber Security
iii.	Explain Key IT Requirement of FISMA
B	**Solve any One** **10 marks each**
i.	Explain how Intellectual Property Laws protect the rights of the owner of the Intellectual Property
ii.	Explain Key features of Indian Information Technology Act 2000.

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

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

Time: 2 hour Max. Marks: 80

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

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

Program: **ALL_Institute Level Optional Course 1**
Curriculum Scheme: Rev2016
Examination: BE Semester VII
Course Code: ILO 701**7**
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.	Which of the following is NOT occurred as a consequence of earthquake
Option A:	Tsunami
Option B:	Fire
Option C:	Damage to building
Option D:	Drought
2.	Which of the following is NOT the natural cause of flood .
Option A:	River bank erosion
Option B:	Poor natural drainage
Option C:	Heavy rain
Option D:	Deforestation
3.	Terrorism is a _____type of disaster
Option A:	Man made
Option B:	Natural
Option C:	Both natural and man made
Option D:	Neither natural nor man made
4.	World Health Organization (WHO) was established in
Option A:	1950
Option B:	1948
Option C:	1947
Option D:	1960
5.	Who heads NDMA, the apex body for Disaster management
Option A:	Home Minister
Option B:	Finance Minister
Option C:	Prime Minister
Option D:	Home Secretary
6.	Which of the following is a disaster mitigation strategy?
Option A:	Constructing cyclone shelters

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

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

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

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

University of Mumbai

Examination 2020 under cluster ALL (Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 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

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

Q16.	B
Q17.	A
Q18.	C
Q19.	B
Q20.	A

University of Mumbai

Examination 2020 under cluster ALL (Lead College:)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7018 and Course Name: EAM

Time: 2 hour Max. Marks: 80

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

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

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

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

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

University of Mumbai

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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

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

University of Mumbai

Examination 2020 under cluster ALL(Lead College: VCET)

Examinations Commencing from 7th January 2021 to 20th January 2021

Program: **ALL_Institute Level Optional Course 1**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7019 and Course Name: Development Engineering

Time: 2 hour Max. Marks: 80

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0701_R16_ALL_VII_ILO7019_QP1

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

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

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

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

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

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Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ILO 7019 and Course Name: Development engineering

Time: 2 hour Max. Marks: 80

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0701_R16_ALL_VII_ILO7019_AK1

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