University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 23rd December 2020 to 6th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2012
Examination: TE   Semester VI
Course Code: EXC604 and Course Name: Power Electronics-I

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
Q1.	The output voltage of single phase fully controlled rectifier is (α is the firing angle)
Option A:	$\frac{V_m}{\pi} \cos\alpha$
Option B:	$2\frac{V_m}{\pi} \cos\alpha$
Option C:	$\frac{V_m}{\pi} (1+\cos\alpha)$
Option D:	$\frac{2V_m}{\pi} (1+\cos\alpha)$
2.	In a single-phase half wave inverter _____ SCR(s) are/is gated at a time.
Option A:	one
Option B:	two
Option C:	Three
Option D:	Four
3.	The turn-off gain β_{off} of the GTO is given by _____.
Option A:	I_g/I_a
Option B:	I_a/I_g
Option C:	V_a/V_g
Option D:	V_g/V_a
4.	The type of commutation in which the pulse to turn off the SCR is obtained by separate voltage source is
Option A:	class B commutation
Option B:	class C commutation
Option C:	class D commutation
Option D:	class E commutation
5.	In a VSI (Voltage source inverter)
Option A:	the internal impedance of the DC source is negligible

Option B:	the internal impedance of the DC source is very high
Option C:	the internal impedance of the AC source is negligible
Option D:	the IGBTs are fired at 0 degrees
6.	A step - down choppers can be used in
Option A:	Electric traction
Option B:	Electric vehicle
Option C:	Machine tools
Option D:	All the above mentioned applications
7.	AC voltage controllers converts-
Option A:	Fixed ac to fixed dc
Option B:	Fixed ac to variable ac
Option C:	Variable ac to variable dc
Option D:	Variable ac to fixed dc
8.	The body of an IGBT consists of _____.
Option A:	P layer
Option B:	N layer
Option C:	PN layer
Option D:	Metal
9.	Buck-Boost acts as Buck converter for duty cycle is equal to _____
Option A:	9
Option B:	7
Option C:	6
Option D:	4
10.	The class A commutation or load commutation is possible in case of
Option A:	Dc circuits only
Option B:	Ac circuits only
Option C:	Both DC and AC circuits
Option D:	None of the above mentioned
11.	A fly-back converter is to be designed to operate in just-continuous conduction mode when the input dc is at its minimum expected voltage of 200 volts and when the load draws maximum power. The load voltage is regulated at 16 volts. What should be the primary to secondary turns ratio of the transformer if the switch duty ratio is limited to 80%. Neglect ON-state voltage drop across switch and diodes.
Option A:	20 :1
Option B:	30 :1
Option C:	25 :2
Option D:	50 :1
12.	Line-commutated inverters have
Option A:	AC on the supply side and DC on the load side
Option B:	AC on both supply and load side
Option C:	DC on both supply and load side

Option D:	DC on the supply side and AC on the load side
13.	Among the following, the most suitable method to turn on the SCR device is the
Option A:	Gate triggering method
Option B:	dv/dt triggering method
Option C:	Forward voltage triggering method
Option D:	Temperature triggering method
14.	The major function of the pulse transformer is to
Option A:	Increase the voltage amplitude
Option B:	Reduce harmonics
Option C:	Isolate low & high-power circuit
Option D:	Create periodic pulses
15.	A single-phase voltage-source-square wave inverter feeds pure inductive load. The waveform of the load current will be
Option A:	Sinusoidal
Option B:	Rectangular
Option C:	Trapezoidal
Option D:	Triangular
16.	_____ are semiconductor thyristor devices which can be turned-on by light of appropriate wavelengths.
Option A:	LGTOs
Option B:	LASERs
Option C:	MASERs
Option D:	LASCRs
17.	In an ideal step-up chopper, the output power is
Option A:	More than input power
Option B:	Less than input power
Option C:	Equal to input power
Option D:	Ratio of input power to output power
18.	Which are the two ac voltage control methods.
Option A:	Single phase rectifiers and three phase rectifiers
Option B:	Ac phase control and cycloconverter
Option C:	ICC and ac phase control
Option D:	Cycloconverter and inverter
19.	In continues gating
Option A:	Overlap angle is very high
Option B:	SCR is heated up
Option C:	Size of the pulse transformer is small
Option D:	Commutation cannot be achieved effectively
20.	Pulse gating is suitable for
Option A:	R loads only

Option B:	R and RL loads
Option C:	RL loads only
Option D:	all types of loads

Option 2

Q2. (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	Explain the operation of uncontrolled bridge rectifier with R load with neat circuit diagram and necessary waveforms. Deduce the expression for ripple factor.
B	Explain the operation of three phase circulating current type dual converter and obtain the expression for peak value of circulating current. Draw the relevant voltage and current waveforms.
C	Explain the operation of IGBT with its structural diagram. Give Comparison between Punch through and non-punch through IGBT.

Q3. (20 Marks Each)	Solve any Two Questions out of Three 10 marks each
A	Explain the operation of single phase cycloconverter with RL load.
B	Explain the single phase PWM technique used in inverters. Explain different methods used for reduction of harmonics in inverter output.
C	Explain the operation of Buck-Boost Converter. State advantages and disadvantages of it.

Program: BE Electronics Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: **EXC 605** and Course Name: **Digital Signal Processing and Processors**

Time: 1 hour   Max. Marks: 50

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

Q1.	The average power of a discrete time periodic signal with period N is defined in terms of discrete time Fourier series coefficients as:
Option A:	$P_x = \sum_{k=0}^{N-1} |ck^2|$
Option B:	$P_x = \sum_{k=0}^{N-1} |ck|$
Option C:	$P_x = N \sum_{k=0}^{N-1} |ck^2|$
Option D:	$P_x = (\frac{1}{N}) \sum_{k=0}^{N-1} |ck|$
Q2.	What is the possible range of frequency spectrum for discrete time Fourier series (DTFS)?
Option A:	$-\pi$ to π
Option B:	$-\infty$ to ∞
Option C:	0 to π
Option D:	0 to ∞
Q3.	Compute linear convolution of x(n)= [4,5] and h(n)= [1,2,3]
Option A:	[15,11,13,16,11]
Option B:	[15,11,15,16]
Option C:	[12,10,13,16,9]
Option D:	[4,13,22,15]
Q4.	Calculate the number of complex multiplications and complex additions for 1024-point FFT.
Option A:	5120, 10240
Option B:	4608,2304
Option C:	261632, 262144
Option D:	262144, 261632
Q5.	Compute 4-point DFT of sequence x(n)= {1,2,4,0}

Option A:	[2,1-j,1,1+j]
Option B:	[7,-3-2j,3,-3+2j]
Option C:	[7,1+j,0,1-j]
Option D:	[7,-3-2j,0,-3+2j]
Q6.	The first five DFT Coefficients of a 8-point DFT of a real valued sequence are X(0) =0.5, X(1)=2+j, X(2)=3+2j, X(3)=j, X(4)= 3. The remaining DFT Coefficients X(5),X(6) and X(7) are respectively.
Option A:	-j,2-j,3-2j
Option B:	-j,3-2j,2-j
Option C:	3-2j,j,2+j
Option D:	1-j3,5, j
Q7.	In bilinear transformation method relationship between w and Ω is given by
Option A:	$\Omega = \frac{2}{T}\tan\frac{w}{2}$
Option B:	$\Omega = tan^{-1}\frac{w}{2}$
Option C:	$\Omega = \frac{2}{F}\tan\frac{w}{2}$
Option D:	$\Omega = \frac{2}{F}tan^{-1}\frac{w}{2}$
Q8.	What is the lowest order of the analog Butterworth filter with a pass band attenuation of 4 dB at Ω_P=4 rad/sec and stop band attenuation greater than or equal to 40 dB at Ω_S = 8 rad/sec?
Option A:	4
Option B:	5
Option C:	3
Option D:	7
Q9.	For the same specifications how is the number of poles in a Chebyshev filter is related to that of Butterworth filter?
Option A:	It is more
Option B:	It is less
Option C:	It is equal
Option D:	It can be more or less
Q10.	The mapping in the impulse invariant method is
Option A:	many to one
Option B:	One to one
Option C:	One to many
Option D:	Many to many
Q11.	A digital filter is required to have a cut off frequency of 200 Hz and sampling frequency of 1000 Hz. What is analog filter cut off frequency when BLT method is used for filter design?
Option A:	1453.08 rad/s

Option B:	6155.36 rad/s
Option C:	639.84 rad/s
Option D:	1256 rad/s
Q12.	An analog filter has the transfer function $H(S) = \frac{1}{S+1}$ .Using impulse invariant method transform it to a digital filter for sampling interval T=1s
Option A:	$$H(z) = \frac{1}{1 - 0.367z^{-1}}$$
Option B:	$$H(z) = \frac{12}{1 - 0.367z^{-1}}$$
Option C:	$$H(z) = \frac{1}{1 + 0.367z^{-1}}$$
Option D:	$$H(z) = \frac{1}{1 - 0.367z^{1}}$$
Q13.	For a III order Linear Phase FIR filter, following are the locations of poles and zeros: $p_1 = p_2 = p_3 = 0$ and $z_1 = 1$, $z_2 = 0.5$. What is the location of 3rd zero?
Option A:	3
Option B:	2
Option C:	J
Option D:	-j
Q14.	h(n)= [1,2,3,4, -4, -3, -2, -1] is which type of Linear phase FIR filter?
Option A:	Type 1
Option B:	Type 2
Option C:	Type 3
Option D:	Type 4
Q15.	Compute the value of causal Blackman window function of length 7 at n=2 i.e. w (4) is
Option A:	0.5
Option B:	1
Option C:	0.63
Option D:	0.8
Q16.	All poles of FIR Filter lies on
Option A:	Unit circle
Option B:	Origin
Option C:	Exterior of unit circle
Option D:	Interior of unit circle except at origin

Q17.	Which of the following is introduced in the frequency sampling realization of the FIR filter?
Option A:	Poles are more in number on unit circle
Option B:	Zeros are more in number on the unit circle
Option C:	Poles and zeros at equally spaced points on the unit circle
Option D:	Only zeros are present
Q18.	The main lobe width of length N rectangular window is
Option A:	$\dfrac{4\pi}{N}$
Option B:	$\dfrac{12\pi}{N}$
Option C:	$\dfrac{8\pi}{N}$
Option D:	Variable
Q19.	Due to quantization the output oscillations in the absence of input are called _____.
Option A:	overflow limit cycle
Option B:	zero input limit cycle
Option C:	underflow limit cycle
Option D:	zero output limit cycle
Q20.	Determine the dead band of a single pole filter given by difference equation y(n)=0.5y(n-1) +x(n) when the product is quantized to 5 bits (including sign bit) by rounding.
Option A:	-0.0625 to 0.0625
Option B:	-1 to 1
Option C:	0 to 1
Option D:	0 to 0.625
Q21.	Which of the following is false with respect to the limit cycle in a recursive system?
Option A:	Limit cycles are due to product quantization.
Option B:	During limit cycle, the output is finite or oscillate between finite values.
Option C:	Limit cycles exists even if the input is very much larger than the dead band.
Option D:	During limit cycle, the output is finite even if the input is zero.
Q22.	Which functional unit is used for linear and circular addressing mode in TMS 320 C6X processors?
Option A:	L
Option B:	S
Option C:	M
Option D:	D

Q23.	In DSP processors McBSP means
Option A:	Multi-channel buffered synchronous ports
Option B:	Multi-configuration buffered serial ports
Option C:	Multi-channel buffered serial ports
Option D:	Multi-configuration buffered synchronous ports
Q24.	C6X processors include advanced VLIW CPU with
Option A:	2 multipliers and 6 ALUs
Option B:	6 multipliers and 2 ALUs
Option C:	4 multipliers and 4 ALUs
Option D:	3 multipliers and 5 ALUs
Q25.	Waveform coding techniques and parametric coding techniques are used for _____
Option A:	IIR filter design
Option B:	Speech coding
Option C:	FIR Filter design
Option D:	RADAR applications

Course Code: EXC601   **Course Name: Basic VLSI Design**

Time: 1 hour   **Max. Marks: 50**

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Note:

1. All Questions are compulsory and carry equal marks.

2. Assume suitable data wherever necessary.

Q1.	What is MOSFET?
Option A:	Metal Oxide conductor Field Effect Transistor
Option B:	Mask Oxide Semiconductor Field Effect Transistor
Option C:	Metal On Semiconductor Far Effect Transistor
Option D:	Metal Oxide Semiconductor Field Effect Transistor
Q2.	Which is true for PMOS Pass transistor logic from following if A is input, B is controlling input and X is output?
Option A:	A = 0 , B = 1 , X = 1
Option B:	A = 1 , B = 1 , X = 1
Option C:	A = 0 , B = 0 , X = 0
Option D:	A = 1 , B = 0 , X = 0
Q3.	Select the incorrect option related to SRAM
Option A:	Does not require refreshing
Option B:	More expensive than DRAM
Option C:	Slower than DRAM
Option D:	low capacity (less dense)
Q4.	In Cut-off Mode, the capacitance Cgs will be equal to:
Option A:	2Cgd
Option B:	0
Option C:	Cgb
Option D:	Cgd
Q5.	If A& B are two inputs of a carry look ahead adder then what is the Generate variable G
Option A:	G = A.B
Option B:	G = A+B
Option C:	G = (A'B+AB')
Option D:	G = (A'B'+AB)

Q6.	DRAM uses a MOS capacitor as _____ instead of flip flop
Option A:	Static Cell
Option B:	Dynamic Cell
Option C:	Memory Cell
Option D:	Flash cell
Q7.	The generation of a low-impedance path in CMOS chips between the power supply rail and the ground rail due to interaction of parasitic pnp and npn bipolar transistors is called_____
Option A:	Latch-up
Option B:	Guard ring
Option C:	Substrate ring
Option D:	Electrostatic Discharge
Q8.	The Power Supply distributed grid is a set of _____
Option A:	Dielectric lines
Option B:	Metal Lines
Option C:	Resistor Lines
Option D:	Capacitor Lines
Q9.	The expression for Low Noise Margin is given by
Option A:	$V_{OL} - V_{IL}$
Option B:	$V_{OH} - V_{IH}$
Option C:	$V_{IL} - V_{OL}$
Option D:	$V_{IH} - V_{OH}$
Q10.	When in MOSFET, Channel width W is on the same order of magnitude as the maximum depletion region thickness xdm, the effect is called as
Option A:	Punch through effect
Option B:	Hot electron effect
Option C:	Short channel effect
Option D:	Sub threshold conduction
Q11.	Pierce Crystal Oscillator Circuit is used for _____
Option A:	Clock Distribution
Option B:	Clock Generation
Option C:	Clock Stabilization
Option D:	Clock skew
Q12.	In Transmission Gate Logic PMOS and NMOS are connected in_____
Option A:	Parallel
Option B:	Series
Option C:	Anti-parallel
Option D:	Cascade
Q13.	Interconnect scaling on horizontal parameters cause delay to_____
Option A:	Increase

Option B:	Decrease
Option C:	Unchanged
Option D:	becomes zero
Q14.	In Bidirectional I/O Circuits, the output circuit uses large Driver FETs that are controlled by
Option A:	NAND and NOR
Option B:	AND and OR
Option C:	XOR and OR
Option D:	AND and XOR
Q15.	In Pseudo-nMOS logic, n transistor operates in_____
Option A:	Resistive region
Option B:	Cut off region
Option C:	Non saturation region
Option D:	Saturation region
Q16.	Dynamic Power is _____
Option A:	Directly Proportional to frequency but Inversely Proportional to Load Capacitance
Option B:	Inversely Proportional to frequency but Directly Proportional to Load Capacitance
Option C:	Directly Proportional to frequency and Load Capacitance
Option D:	Inversely Proportional to frequency and Load Capacitance
Q17.	If A, B and C are the inputs of a full adder then the sum is given by _____
Option A:	A AND B AND C
Option B:	A OR B AND C
Option C:	A XOR B XOR C
Option D:	A OR B OR C
Q18.	The power-delay product (PDP) is given by____, where P_{avg} is the average power dissipation over a switching cycle, and T_p is the propagation delay
Option A:	$(P_{avg} \times T_p) + 3$
Option B:	$P_{avg} + 2T_p$
Option C:	$3P_{avg} - T_p$
Option D:	$P_{avg} \times T_p$
Q19.	Propagation delay of barrel shifter is
Option A:	theoretically constant
Option B:	dependent of shifter size
Option C:	dependent on no. of shifts
Option D:	dependent on number of clock cycles
Q20.	When 2 MOSFETs having W/L ratio 4 are connected in parallel, what will be the equivalent W/L ratio?
Option A:	6
Option B:	8
Option C:	2
Option D:	0.5

Q21.	No. of full adders required for four bit ripple carry adder is
Option A:	2
Option B:	4
Option C:	8
Option D:	3
Q22.	How many transistors are used to implement CMOS SR latch circuit based on 2 Input NOR gates?
Option A:	4
Option B:	6
Option C:	8
Option D:	12
Q23.	What is the correct rule from following for Static CMOS Logic?
Option A:	Pull Down Network is constructed using PMOS Devices
Option B:	Pull Up Network is constructed using NMOS Devices
Option C:	Pull Down Network is constructed using PMOS & NMOS Devices
Option D:	Pull Up Network is constructed using PMOS Devices
Q24.	Basic active device used in EPROM is
Option A:	BJT
Option B:	FAMOS Transistor
Option C:	FLOTOX
Option D:	FET
Q25.	Select the incorrect statement about Depletion load nMOS inverter
Option A:	The driver device is an enhancement-type nMOS transistor with $Vt > 0$
Option B:	The pull up network consists of depletion mode nMOS transistor with its gate connected to its source
Option C:	It's a ratioed logic
Option D:	Total area occupied by a depletion-load inverter circuit with an acceptable circuit performance is expected to be much larger than the area occupied by a comparable resistive-load inverter

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 23rd December 2020 to 6th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev2012
Examination: TE Semester VI
Course Code: EXC605 and Course Name: Digital Signal Processing and Processors

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.	Which of the transforms below is best suited to represent a discrete time signal x[n] with finite number of samples
Option A:	Fourier Transform
Option B:	Z-Transform
Option C:	Fourier Series
Option D:	Discrete Fourier Transfom
2.	Consider the sequence x[n]=[0,1,0,1] and h[n]=[1,2,1,2] .The circular convolution of x[n] with h[n] is given by
Option A:	1,-1,-1,1
Option B:	5,-5,-5,5
Option C:	4,2,4,2
Option D:	2,0,-2,0
3.	The 4 point DFT of {1,1,0,0}
Option A:	{2,1+j,0,1-j}
Option B:	{2,j,0,-j}
Option C:	{2,1-j,0,1+j}
Option D:	{2,-j,0,j}
4.	When the DFT of a sequence x[n] is imaginary?
Option A:	x[n] is real and even
Option B:	x[n] is real and odd
Option C:	x[n] is imaginary and odd
Option D:	x[n] is real
5.	The number of complex multiplication required to calculate N point DFT using radix 2 DIT FFT algorithm is
Option A:	$Nlog_2N$
Option B:	$\frac{N}{2}log_{10}N$
Option C:	$N\,log_{10}N$
Option D:	$\frac{N}{2}log_2N$
6.	Impulse invariant method is suitable for the following type of digital filters

Option A:	Low pass filters
Option B:	High Pass filters
Option C:	Bandpass filters
Option D:	Bandstop filters
7.	IIR filter is preferred when
Option A:	No phase distortion is desired
Option B:	Sharp cutoff frequencies required
Option C:	Stable filter is required
Option D:	Linear phase is required
8.	For a system function H(s) to be stable
Option A:	The zeros lie in left half of the s plane
Option B:	The zeros lie in right half of the s plane
Option C:	The poles lie in left half of the s plane
Option D:	The poles lie in right half of the s plane
9.	The frequency transformation to obtain a high pass filter from a lowpass filter is by replacing s by
Option A:	$\dfrac{s}{\Omega c}$
Option B:	$\dfrac{\Omega c}{s}$
Option C:	$s.\Omega c$
Option D:	$S+\Omega c$
10.	A filter is said to be linear phase if the group delay and phase delay are
Option A:	Equal
Option B:	High
Option C:	Constant
Option D:	Low
11.	How to identify linear phase from pole zero plot?
Option A:	All zeros at zero and poles show conjugate reciprocal property
Option B:	All poles at zero and zeros show conjugate reciprocal property
Option C:	All poles to the left of s plane and no zeros
Option D:	All zeros on imaginary axis and poles on real axis
12.	The FIR filter is characterized by
Option A:	$H(z)=\sum_{k=0}^{N-1} h(k)z^{-k}$
Option B:	$H(z)=\dfrac{\sum_{k=0}^{N} b_k \ z^{-k}}{[1+\sum_{k=1}^{M} a_k \ z^{-k}]}$
Option C:	$y[n] = \sum_{k=0}^{N} b_k \ x(n-k) - \sum_{1}^{M} a_k y(n-k)$
Option D:	$y[n]=\sum_{k=0}^{\infty} h(k)x(n-k)$
13.	In FIR filter design, the desirable feature of a window in the frequency spectrum is
Option A:	Large width of main lobe and side lobes with very low magnitude
Option B:	Small width of main lobe and side lobes with very high magnitude
Option C:	Small width of main lobe and side lobes with very low magnitude

Option D:	Large width of main lobe and side lobes with very large magnitude
14.	Which of the following statement is true
Option A:	Convolving two signals in time domain is adding their spectra in frequency domain
Option B:	Convolving two signals in time domain is multiplying their spectra in frequency domain
Option C:	Convolving two signals in time domain is subtracting their spectra in frequency domain
Option D:	Convolving two signals in time domain is dividing their spectra in frequency domain
15.	Which of the following is false with respect to limit cycle in recursive system?
Option A:	Limit cycles are due to product quantization
Option B:	During limit cycle, the output is finite or oscillates between finite values
Option C:	Limit cycle exists even if the input is much larger than the dead band
Option D:	During limit cycle, the output is finite even if the input is 0
16.	In Harvard architecture
Option A:	Instructions and operands can be fetched simultaneously
Option B:	Instructions and operands cannot be fetched simultaneously
Option C:	Possess only one bus
Option D:	Same bus carries all the information exchanged between the CPU and the peripherals
17.	In Pipelining different phases of operation and execution of instructions are carried out
Option A:	Sequentially
Option B:	In parallel
Option C:	In series
Option D:	In cascade
18.	An IIR filter implemented using finite length register, the output may oscillate between positive and negative values even with zero input. This effect is referred as
Option A:	Zero input limit cycle
Option B:	Overflow oscillations
Option C:	Parity cycle
Option D:	Gibbs effect
19.	Bit reversed addressing is
Option A:	Immediate addressing
Option B:	Indirect addressing
Option C:	Memory mapped addressing
Option D:	Register addressing
20.	The window function which maximizes energy concentration in main lobe
Option A:	Hamming window
Option B:	Hanning window

Option C:	Blackmann window
Option D:	Kaiser window

Q2. (20 Marks)	Solve any Two Questions out of Three 10 marks each
A	Determine the IDFT of the sequence X(k)={5,0,1-j,0,1,0,1+j,0}
B	For the analog transfer function H(s) $= \frac{2}{(s+1)(s+2)}$ determine Hz) using impulse invariant method. Assume T=1sec.
C	Explain any one of the applications of Digital signal Processing.

Q3. (20 Marks)	Solve any Two Questions out of Three 10 marks each
A	The output signal of an A/D converter is passed through a first order low pass filter with transfer function given by H(z)= $\frac{0.5z}{z-0.5}$. Find the steady state output noise from digital filter, when the input signal is quantized to have eight bits.
B	Using a rectangular window technique design a lowpass filter with passband gain of unity, cutoff frequency of 1000Hz and working at a sampling frequency of 5 KHz. The length of impulse response should be 7.
C	Explain various addressing modes of TMS320c67xx DSP processor.

University of Mumbai

Examination 2020 under cluster Vidyavardhini's College of Engg & Tech

Program: BE Electronics Engineering

Curriculum Scheme: Revised 2012 (CBSGS)

Examination: Third Year Semester VI

Course Code: EXC602   **Course Name: Advanced Instrumentation Systems**

Time: 1 hour   **Max. Marks: 50**

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Note:

1. All Questions are compulsory and carry equal marks.

2. Assume suitable data wherever necessary.

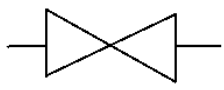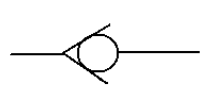| Q1.	A typical data acquisition system consists of _____
Option A:	Op amps
Option B:	Sensors
Option C:	Rectifiers
Option D:	Transistors
Q2.	Data acquisition system can be used in _____
Option A:	10 ways
Option B:	8 ways
Option C:	4 ways
Option D:	2 ways
Q3.	A pneumatic symbol is:
Option A:	Different from a hydraulic symbol used for the same function
Option B:	The same as a hydraulic symbol used for the same function
Option C:	Not to be compared to a hydraulic symbol used for the same function
Option D:	None of the mentioned
Q4.	The lubricator in a pneumatic circuit is the:
Option A:	First element in line
Option B:	Second element in line
Option C:	Last element in line
Option D:	Third element in line
Q5.	Fluid power circuits use schematic drawings to:
Option A:	Simplify component function details
Option B:	Make it so only trained persons can understand the functions
Option C:	Make the drawing look impressive
Option D:	Make untrained person to understand
Q6.	Hydraulic and pneumatic circuits:
Option A:	Perform the same way for all functions

Option B:	Perform differently for all functions
Option C:	Perform the same with some exceptions
Option D:	Does not perform all the functions
Q7.	Which type of compressor requires a reservoir for compressed air and why?
Option A:	Rotary compressor to avoid pulsating effect
Option B:	Reciprocating compressor to avoid pulsating effect
Option C:	Both rotary and reciprocating compressors to avoid pulsating effect
Option D:	None of the mentioned
Q8.	Which of the following is a component used in air generation system?
Option A:	Pressure switch
Option B:	Pressure gauge
Option C:	Drier
Option D:	Intercooler
Q9.	Which of the following is used as a component in hydraulic power unit?
Option A:	Pressure gauge
Option B:	Filler gauge
Option C:	Valve
Option D:	Reservoir
Q10.	Rotary motion in a hydraulic power unit is achieved by using
Option A:	Hydraulic cylinder
Option B:	Pneumatic cylinder
Option C:	Both hydraulic and pneumatic cylinder
Option D:	None of the mentioned
Q11.	Which of the following statements are true? 1) Bell housing connects motor and pump 2) Centrifugal pump is a non-positive displacement pump 3) Centrifugal pumps allow the back flow of fluid from delivery side to the suction side of the pump 4) The function of vent plug used in a reservoir is to flush out oil
Option A:	1, 2 and 4
Option B:	2, 3 and 4
Option C:	2 and 3
Option D:	All of the mentioned
Q12.	Which of the following is used as an accessory in hydraulic power unit?
Option A:	Pumps
Option B:	Valves
Option C:	Motor
Option D:	Reservoir
Q13.	Pumps used in hydraulic applications are
Option A:	Positive displacement pumps
Option B:	Variable displacement pumps

Option C:	Fixed displacement pumps
Option D:	All of the mentioned
Q14.	While operating a positive displacement pump,
Option A:	The shut-off valve should be closed on delivery side
Option B:	The shut-off valve should be closed on suction side
Option C:	The shut-off valve should be opened on delivery side
Option D:	None of the mentioned
Q15.	Variable displacement pumps used in hydraulic applications can 1. have variable flow rate 2. consume less energy 3. be operated with high accuracy for slow and rapid motion 4. generate more heat
Option A:	1 and 2
Option B:	3 and 4
Option C:	1, 2 and 3
Option D:	All of the mentioned
Q16.	Which type of compressor requires a reservoir for compressed air and why?
Option A:	Rotary compressor to avoid pulsating effect
Option B:	Reciprocating compressor to avoid pulsating effect
Option C:	Both rotary and reciprocating compressors to avoid pulsating effect
Option D:	None of the mentioned
Q17.	Select the correct standard symbols for the hydraulic elements given below. Hydraulic elements 1. check valve 2. hydraulic motor 3. shut-off valve 4. pneumatic motor standard symbol 1 a) standard symbol 2 b)

standard symbol 3

c)

standard symbol 4

d)

Option A:	1-C 2-A 3-B 4-D
Option B:	1-A 2-C 3-B 4-D
Option C:	1-B 2-D 3-A 4-C
Option D:	1-A 2-D 3-B 4-C
Q18.	In _____ velocity of fluid is constant on every point at a specific time.
Option A:	Steady flow
Option B:	Rotational flow
Option C:	Non steady flow
Option D:	None of the mentioned
Q19.	Which of the following converts flow to rotational motion?
Option A:	Rotatic vane system
Option B:	Rotameter flow system
Option C:	Both rotameter flow system and rotatic vane system
Option D:	None of the mentioned
Q20.	Which of the following uses displacement to pressure conversion?
Option A:	Flapper nozzle system
Option B:	Gyroscope
Option C:	Viscometer
Option D:	None of the mentioned
Q21.	Displacement to pressure systems are used for measuring _____
Option A:	Displacement
Option B:	Velocity
Option C:	Acceleration
Option D:	Force
Q22.	Seismic displacement transducers are not suitable for measuring _____
Option A:	Vibrating velocities
Option B:	Static velocities

Option C:	Dynamic velocities
Option D:	None of the mentioned
Q23.	The main purpose of a control valve positioner is to:
Option A:	Alter the fail-safe status of the valve
Option B:	Improve the precision of the valve
Option C:	Alter the characterization of the valve
Option D:	Increase transmitter accuracy
Q24.	Cavitation in a control valve is caused by:
Option A:	Process noise
Option B:	Vibration in the piping
Option C:	The Von Karman effect
Option D:	Pressure recovery
Q25.	A condition where integral control action drives the output of a controller into saturation is called:
Option A:	self-bias
Option B:	wind-up
Option C:	Repeat
Option D:	Noise

University of Mumbai
Examination 2020 under Cluster 06
(Lead College: Vidyavardhini's College of Engg Tech)
Examinations Commencing from 23rd December 2020 to 6th January 2021
Program: **Electronics Engineering**
Curriculum Scheme: Rev 2012
Examination: TE Semester VI

Course Code: EXC606 and Course Name: Modern Information Technology for Management

Time: 1 hour   Max. Marks: 40

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	What is the term given to the discipline focused on the integration of computer systems to meet the aims and objectives of an organization?
Option A:	Management Information Systems
Option B:	Expert Systems
Option C:	Geographic Information Systems
Option D:	Health Information Systems
2.	Which of the following is not a class of Information system applications?
Option A:	database management system
Option B:	decision support system
Option C:	expert system
Option D:	management information system
3.	Which OSI layer supports Segment data format?
Option A:	Application
Option B:	Transport
Option C:	Physical
Option D:	Data link
4.	What is the prime driver for enterprise security?
Option A:	Globalization
Option B:	Internet connectivity
Option C:	Security regulators
Option D:	Intruder prevention system
5.	SNMP uses two protocols :_____ & _____
Option A:	MIB; SMTP
Option B:	FTP; SMI
Option C:	SMI ; MIB
Option D:	FTP; SMTP

6.	Which of the following is not a limitation of IPv4 addressing system?
Option A:	The lack of address space
Option B:	insufficient size of the IPv4 header
Option C:	problem of security of communications
Option D:	IPv4 protocols have simple prefixes
7.	Which of the following is not a source of threat to the network security?
Option A:	Distributed denial of service
Option B:	Unauthorized access
Option C:	Privacy violation
Option D:	VPN
8.	What is the process in which a buyer posts its interest in buying a certain quantity of items, and sellers compete for the business by submitting successively lower bids until there is only one seller left?
Option A:	B2B marketplace
Option B:	Reverse Auction
Option C:	Intranet
Option D:	Auditing
9.	IT infrastructure is characterized by which of the model?
Option A:	5C
Option B:	4A
Option C:	7S
Option D:	8F
10.	Which is an open source monitoring system designed to run on the Linux operating system and can monitor devices running Linux, Windows and Unix operating systems?
Option A:	Nagios
Option B:	Big Brother
Option C:	Cacti
Option D:	CIA

Q2.	Solve any one Question out of two (10 Marks Each)
A	What are three main types of storage? Write a short note on each.
B	Define Firewall. Differentiate between different types of firewall in detail.

Q3.	Solve any one Question out of two (10 Marks Each)
A	Why is audit needed? What is the planning required for conducting audit?
B	What is Enterprise resource planning? Explain its need and benefit for businesses?

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

Q1.	A specialized transducer that converts radio-frequency (RF) fields into alternating current (AC) or vice-versa. There are two basic types: the receiving antenna, which intercepts RF energy and delivers AC to electronic equipment, and the transmitting antenna, which is fed with AC from electronic equipment and generates an RF field is called
Option A:	System
Option B:	Antenna
Option C:	Transmitter
Option D:	Receiver
Q2.	Image Processors, Databases and Word Processors are example of:
Option A:	Application Software
Option B:	System Software
Option C:	Network Software
Option D:	Data Software
Q3.	Which OSI layer supports Segment data format?
Option A:	Application
Option B:	Physical
Option C:	Transport
Option D:	Presentation
Q4.	Which OS are designed to operate on small machines for eg. PDA's
Option A:	Embedded
Option B:	Distributed
Option C:	Mutitasking
Option D:	Single tasking
Q5.	Assembling the resources to achieve a Mutually agreed upon objective is called
Option A:	Virtualisation
Option B:	Scutinization
Option C:	Management
Option D:	Computing
Q6.	What is the first step towards achieving optimum performance from the network?
Option A:	Unstuctured Cabling
Option B:	Distributed Cabling
Option C:	Stuctured Cabling
Option D:	Grid Cabling

Q7.	Cable TV uses _____ fiber cable
Option A:	Single mode Fibre
Option B:	Multimode Fibre
Option C:	Graded-index Fibre
Option D:	Grid Fibre
Q8.	Generally, Network efficiency is calculated using equation
Option A:	Network Efficiency = Transported Traffic x Costs
Option B:	Network Efficiency = Transported Traffic / Costs
Option C:	Network Efficiency = Transported Traffic ^2 / Costs
Option D:	Network Efficiency = Transported Traffic / Costs^2
Q9.	What are the three types of Storage Models?
Option A:	DAS, SAN, NAS
Option B:	LAN, WLAN, GSM
Option C:	2G, 3G, 4G
Option D:	CDMA,EDGE,ULTRA
Q10.	What is the most basic level of storage?
Option A:	Storage Area Networks
Option B:	Direct attached storage
Option C:	Network-attached storage
Option D:	Cloud Storage
Q11.	An approach to the protection of computer networks that are remotely bridged to client devices is called _____
Option A:	RFID System
Option B:	firewall
Option C:	Endpoint Security
Option D:	Biometrics
Q12.	Application software that assist users in regular office jobs like creating, updating and maintaining documents, handling large amounts of data, creating presentations, scheduling, etc. are called _____
Option A:	Medical tools
Option B:	Office tools
Option C:	Network tools
Option D:	Electronic tools
Q13.	_____ is the product that presents a view of data as a collection of rows and columns.
Option A:	Data Management System
Option B:	Decision Support Systems
Option C:	Relational Database Management System
Option D:	Office Information Systems

Q14.	What is Cookies?
Option A:	The practice of storing electronic data with a third party service accessed via the Internet
Option B:	A small piece of data stored on the user's computer by the web browser while browsing a website
Option C:	Software or Hardware dedicated to running this software, that can satisfy client requests on the World Wide Web
Option D:	System that monitors and controls incoming and outgoing network traffic based on predetermined security rules
Q15.	SNMP means
Option A:	Simulated Network monitoring Program
Option B:	Single Network Measure Practice
Option C:	Simple Network Management Protocol
Option D:	Soft Network Mining process
Q16.	The overall goal of network management is to maximize
Option A:	network availability only
Option B:	performance only
Option C:	user benefits only
Option D:	network availability, user benefits & user benefits
Q17.	Which of the followings is NOT a Operating System
Option A:	MacOS
Option B:	Python
Option C:	Linux
Option D:	Android
Q18.	In public key encryption system if A encrypts a message using his private key and sends it to B
Option A:	if B knows it is from A he can decrypt it using A's public key
Option B:	Even if B knows who sent the message it cannot be decrypted
Option C:	It cannot be decrypted at all as no one knows A's private key
Option D:	A should send his public key with the message
Q19.	_____ improves the identification and verification technologies.
Option A:	Authentication
Option B:	Interoperability
Option C:	Conformation
Option D:	Automation
Q20.	The objectives of IT audit include
Option A:	Ensures asset safeguarding
Option B:	Ensures that the attributes of data or information are maintained
Option C:	Ensures that the attributes of data or information are maintained & Ensures that the attributes of data or information are maintained
Option D:	Paying external auditors
Q21.	**Components of e-Governance includes?**

Option A:	Behavioral components
Option B:	Psychological components
Option C:	Economical components
Option D:	Strategic components
Q22.	e-Government could transform
Option A:	improving living quality for next generation
Option B:	Earn more revenue from the public
Option C:	services to the citizens
Option D:	Public opinion
Q23.	Which segment do eBay, Amazon.com belong?
Option A:	B2Bs
Option B:	B2Cs
Option C:	C2Bs
Option D:	C2Cs
Q24.	The general transformation cycle for information is
Option A:	information to data to knowledge.
Option B:	. knowledge to data to information
Option C:	data to knowledge to information.
Option D:	data to information to knowledge.
Q25.	If a university sets up a web-based information system that faculty could access to record student grades and to advise students, that would be an example of a/an
Option A:	CRM
Option B:	intranet
Option C:	ERP
Option D:	extranet

University of Mumbai

Examination 2020 under cluster Vidyavardhini's College of Engg & Tech

Program: BE Electronics Engineering

Curriculum Scheme: Revised 2012 (CBSGS)

Examination: Third Year Semester VI

Course Code: EXC603　　　　　　　　**Course Name: Computer Organization**.

Time: 1 hour　　　　　　　　　　　　　　　**Max. Marks: 50**

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Note:

1. All Questions are compulsory and carry equal marks.

2. Assume suitable data wherever necessary.

Q1.	_____ is generally used to increase the apparent size of physical memory.
Option A:	Secondary memory
Option B:	Virtual memory
Option C:	Hard-disk
Option D:	Disks
Q2.	Von Neumann architecture is
Option A:	SIMD
Option B:	MIMD
Option C:	SISD
Option D:	MISD
Q3.	Which of the following generates the necessary signals required to execute an instruction in a computer?
Option A:	Arithmetic and Logic Unit
Option B:	Memory Unit
Option C:	Control Unit
Option D:	Input/ Output Unit
Q4.	The cache memory of 1K words uses direct mapping with a block size of 4 words. How many blocks can the cache accommodate?
Option A:	256 words
Option B:	512 words
Option C:	1024 words
Option D:	128 words
Q5.	Cache memory lies between
Option A:	RAM and ROM
Option B:	Hard disk and RAM
Option C:	Hard disk and CPU
Option D:	CPU and RAM
Q6.	The _____ decides the sequence in which the computer programs and

	instructions are to be executed.
Option A:	Arithmetic and logic unit
Option B:	Central processing unit
Option C:	Control unit
Option D:	Memory
Q7.	In hardwired control unit the control signals are generated by
Option A:	Programs
Option B:	RC circuits
Option C:	LC circuits
Option D:	Combinational circuits
Q8.	Which of the following set of control signals can be used to transfer data from register R4 to register R5?
Option A:	$R4_{out}$, $R5_{in}$
Option B:	$R4_{out}$, MAR_{in}, MDR_{out}
Option C:	$R5_{out}$, $R4_{in}$
Option D:	$R5_{out}$, MAR_{in}, $R4_{in}$
Q9.	The main goal of the page replacement policy is to maximise------.
Option A:	Page Fault
Option B:	Page add
Option C:	Page replace
Option D:	Hit ratio
Q10.	The method of synchronizing the processor with the I/O device in which the device sends a signal when it is ready is?
Option A:	Exceptions
Option B:	DMA
Option C:	Signal Handling
Option D:	Interrupts
Q11.	What are methods of I/O communications
Option A:	Polling
Option B:	Sending
Option C:	Receiving
Option D:	Transmitting
Q12.	A page fault
Option A:	Occurs when there is an error in a specific page.
Option B:	Occurs when a program accesses a page of main memory.
Option C:	Occurs when a program accesses a page not currently in main memory.
Option D:	Occurs when a program accesses a page belonging to another program.
Q13.	Intel IA32(80386DX) is a ---- microprocessor.
Option A:	8 bits
Option B:	64 bits
Option C:	16 bits

Option D:	32 bits
Q14.	In daisy chaining method all devices requesting are connected in
Option A:	Serial
Option B:	Parallel
Option C:	Star
Option D:	Mesh
Q15.	A memory page containing a heavily used variable that was initialized very early and is in constant use is removed, then the page replacement algorithm used is
Option A:	LRU
Option B:	Optimal
Option C:	FIFO
Option D:	LIFO
Q16.	Multiple bus organization is preferred over single bus as it allows
Option A:	Reduction in number of cycles of execution
Option B:	Increase in size of registers
Option C:	Better connectivity
Option D:	Simplified datapath
Q17.	A micro program sequencer
Option A:	Generates the address of next micro instruction to be executed.
Option B:	Generates the control signals to execute a microinstructions
Option C:	Sequentially averages all microinstructions in the control memory
Option D:	Enables the efficient handling of a micro program subroutine
Q18.	Which of the following is lowest in memory hierarchy?
Option A:	Cache memory
Option B:	Secondary memory
Option C:	Registers
Option D:	RAM
Q19.	The operation executed on data stored in registers is called
Option A:	Bit operations
Option B:	Byte operations
Option C:	Macro operations
Option D:	Micro operations
Q20.	Pipelining increases the CPU Instruction_____.
Option A:	Size
Option B:	Throughput
Option C:	Cycle Rate
Option D:	Time
Q21.	In memory –mapped I/O system, which of the following will not be there?

Option A:	LDA
Option B:	IN
Option C:	ADD
Option D:	OUT
Q22.	The performance of cache frequently measured in terms of quantity called
Option A:	Miss Ratio
Option B:	Hit Ratio
Option C:	Latency Ratio
Option D:	Read Ratio
Q23.	IA 32 has an address space of
Option A:	2^4
Option B:	2^{16}
Option C:	2^{32}
Option D:	2^8
Q24.	A device used for video games, flight simulators, training simulators and for controlling industrial robots.
Option A:	Mouse
Option B:	Pen
Option C:	Joystick
Option D:	Keyboard
Q25.	The floating point registers of IA-32 can operate on operands up to
Option A:	128 bit
Option B:	256 bit
Option C:	80 bit
Option D:	64 bit

Course Code: EXC604	Course Name: Power Electronics-I
Time: 1 hour	Max. Marks: 50

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Note:

1. All Questions are compulsory and carry equal marks.

2. Assume suitable data wherever necessary.

Q1.	SCR stands for
Option A:	Silicon commutation rectifier
Option B:	Semi controlled rectifier
Option C:	Silicon controlled regulator
Option D:	Silicon controlled rectifier
Q2.	In the SCR structure the gate terminal is located
Option A:	near the anode terminal
Option B:	near the cathode terminal
Option C:	in between the anode & cathode terminal
Option D:	exactly at anode terminal area
Q3.	For an SCR in the reverse blocking mode, (ideally)
Option A:	leakage current does not flow
Option B:	leakage current flows from anode to cathode
Option C:	leakage current flows from cathode to anode
Option D:	leakage current flows from gate to anode
Q4.	In the reverse blocking mode the middle junction (J_2) of SCR has the characteristics of that of a
Option A:	Transistor
Option B:	Capacitor
Option C:	Inductor
Option D:	Resistor
Q5.	A thyristor can be brought from the forward conduction mode to forward blocking mode by
Option A:	the dv/dt triggering method
Option B:	applying a negative gate signal.
Option C:	applying a negative anode signal.
Option D:	applying a reverse voltage across anode-cathode terminals.
Q6.	IGBT stands for

Option A:	Inductive gate bidirectional transistor
Option B:	Inductive gate bipolar transistor
Option C:	Insulated gate bipolar transistor
Option D:	Insulated gate bidirectional transistor
Q7.	A power MOSFET is a
Option A:	Voltage controlled device
Option B:	Current controlled device
Option C:	Frequency controlled device
Option D:	Duty ratio controlled device
Q8.	TRIAC is a semiconductor power electronic device that is equivalent to
Option A:	Two SCRs connected in parallel.
Option B:	Two SCRs connected in series
Option C:	Two BJT's connected in series
Option D:	Two SCRs connected in reverse parallel
Q9.	In a power MOSFET switching time is of the order of few
Option A:	Seconds
Option B:	Milliseconds
Option C:	Nanoseconds
Option D:	Microseconds
Q10.	A rectifier is a device that converts
Option A:	DC to AC
Option B:	AC to DC
Option C:	AC to AC
Option D:	DC to DC
Q11.	A full wave rectifier with resistive load produces
Option A:	Second harmonic
Option B:	Third harmonic
Option C:	Fifth harmonic
Option D:	Do not produce harmonics
Q12.	If the firing angle in an SCR rectifier is decreased, the output is
Option A:	Increased
Option B:	Maximum
Option C:	Decreased
Option D:	Remain Unaffected
Q13.	In a three-phase half wave diode rectifier using 3 diodes,
Option A:	All diodes conduct together
Option B:	Only two diodes conduct at a time
Option C:	Only one diode conducts at a time
Option D:	All diodes do not conduct together

Q14.	In single Phase fully controlled full wave rectifiers with resistive load voltage and current waveforms are
Option A:	Not in phase
Option B:	Current waveform leads voltage waveform
Option C:	Voltage waveform lags current waveform
Option D:	In phase
Q15.	Inverters converts
Option A:	dc power to dc power
Option B:	dc power to ac power
Option C:	ac power to ac power
Option D:	ac power to dc power
Q16.	A single-phase bridge inverter requires minimum of _____ switching devices
Option A:	3
Option B:	4
Option C:	6
Option D:	8
Q17.	In the three-phase bridge inverter, each step consists of
Option A:	30°
Option B:	60°
Option C:	90°
Option D:	will depend on the value of the firing angle
Q18.	The output voltage from a single phase full wave bridge inverter varies from
Option A:	Vs to -Vs
Option B:	Vs to zero
Option C:	Vs/2 to zero
Option D:	-Vs/2 to Vs/2
Q19.	In the 180° mode VSI, _____ devices conduct at a time.
Option A:	5
Option B:	2
Option C:	3
Option D:	4
Q20.	A Chopper converts
Option A:	dc power to dc power
Option B:	dc power to ac power
Option C:	ac power to ac power
Option D:	ac power to dc power
Q21.	If T is the time period for a chopper circuit and α is its duty cycle, then the chopping frequency is
Option A:	Ton/α

Option B:	Toff/α
Option C:	α/Toff
Option D:	α/Ton
Q22.	For a step-up chopper, when the duty cycle is increased the average value of the output current
Option A:	increases
Option B:	decreases
Option C:	remains the same
Option D:	Cannot be predicted.
Q23.	In AC voltage controllers the
Option A:	Variable ac with variable frequency is obtained
Option B:	Variable ac with fixed frequency is obtained
Option C:	Fixed ac with variable frequency is obtained
Option D:	Fixed ac with fixed frequency is obtained
Q24.	In the integral cycle control method of ac voltage controller
Option A:	Frequency of output voltage is controlled
Option B:	Average power delivered to the load is controlled
Option C:	Instantaneous power delivered to the load is controlled
Option D:	Magnitude of output voltage is controlled
Q25.	The output frequency of a cycloconverter is generally limited to
Option A:	four times the supply frequency
Option B:	twice that of line frequency
Option C:	33% to 50% line frequency
Option D:	less than 10% of line frequency

Course Code: EXC605   **Course Name: Digital Signal Processing & Processors**

Time: 1 hour   **Max. Marks: 50**

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Note:

1. All Questions are compulsory and carry equal marks.

2. Assume suitable data wherever necessary.

Q1.	If sequence x[n] = {1, 2, 3, 4} have its DFT X[k] ={A, B, C, D} then x1[n] = {1, 4, 3, 2} will have its DFT X1[k] equal to _____
Option A:	X1[k] = {A, D, C, B}
Option B:	X1[k] = {A, B, C, D}
Option C:	X1[k] = {A, D, B, C}
Option D:	X1[k] = {A, B, D, C}
Q2.	In an N- point sequences if N= 16, the total number of complex additions and multiplication using Radix 2 FFT are
Option A:	64 and 80
Option B:	80 and 64
Option C:	64 and 32
Option D:	24 and 12
Q3.	In DFT if value of twiddle factor $W_8^6 = j$ then value of W_8^{30} will be
Option A:	J
Option B:	-1
Option C:	-j
Option D:	1
Q4.	If an IIR Low pass filter has its transfer function as $\frac{1}{s+1}$, then its order equal to
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q5.	In Butterworth and Chebyshev transfer function, when N is even, the nature of poles are
Option A:	Complex and exist as conjugate pairs
Option B:	Complex but not conjugate pairs
Option C:	One pole is complex and other poles are real
Option D:	One pole is real and other poles are complex and conjugate

Q6.	For the same specifications how is the number of poles in a Butterworth filter related to that of a Chebyshev filter?
Option A:	It is more
Option B:	It is less
Option C:	It is equal
Option D:	They can be less or more
Q7.	Which of the following is not applicable to a filter?
Option A:	It reduces noise in the signal
Option B:	Extracts information from the signal
Option C:	Separate mixed signals
Option D:	Add the input signals
Q8.	The variance of the response of the system due to error signal is called _____
Option A:	Input noise power
Option B:	Output noise power
Option C:	Input noise energy
Option D:	Input power
Q9.	What is the width of the main lobe of the frequency response of a Bartlett window of length N?
Option A:	π/N
Option B:	$2\pi/N$
Option C:	$4\pi/N$
Option D:	$8\pi/N$
Q10.	Due to quantization the output oscillations in the absence of input are called
Option A:	overflow limit cycle
Option B:	zero input limit cycle
Option C:	underflow limit cycle
Option D:	zero output limit cycle
Q11.	The amplitude range of the oscillation in zero input limit cycle are referred to as
Option A:	Limit Band
Option B:	Cycle Band
Option C:	Dead Band
Option D:	Zero Band
Q12.	What is the sequence in designing digital filter? 1. Coefficients Calculation 2. Performance specification 3. Finite Word length Effect Analysis 4. Hardware/ Software Implementation and Testing 5. Realization of structure
Option A:	2,1,5,3,4
Option B:	1,2,3,4,5
Option C:	2,4,1,3,5
Option D:	5,4,3,2,1

Q13.	If R is the range of analog quantity to be quantized and B is the binary word size, then Quantization step size is
Option A:	$\frac{R}{2B}$
Option B:	$\frac{2R}{2^B}$
Option C:	$\frac{R}{2^B}$
Option D:	$\frac{R}{2^{-B}}$
Q14.	The speech signal,
Option A:	is a one-dimensional function of time.
Option B:	is a two-dimensional function of time.
Option C:	is a two-dimensional function of frequency.
Option D:	is a two-dimensional function of space
Q15.	If desired response of FIR filter is convolved with the main lobe of window function in frequency domain then it will affect
Option A:	Ripple in passband
Option B:	Ripple in stopband
Option C:	Transition Width
Option D:	Amplitude
Q16.	An FIR filter can be designed for any arbitrary frequency response using which of the following methods
Option A:	Rectangular window
Option B:	Hamming Window
Option C:	Bartlett Window
Option D:	Frequency Sampling Method
Q17.	If x[n] = {1,1} will have its 2-point DFT as
Option A:	X[k] = {2,0}
Option B:	X[k] = {2,2}
Option C:	X[k] = {0,0}
Option D:	X[k] = {0,2}
Q18.	Full Form of RADAR:
Option A:	Radioactive Detection and Reception
Option B:	Radio Detection and Ranging
Option C:	Reception Detection Ranging
Option D:	Radioactive Detection Ranging
Q19.	If FIR filter has constant group delay but phase delay is not constant, and N is even then it is of type_____
Option A:	Type I
Option B:	Type II
Option C:	Type III

Option D:	Type IV
Q20.	The TMS 320 s 6713 is a _____ DSP processor
Option A:	fixed point
Option B:	floating point
Option C:	multiprocessor
Option D:	Microprocessor
Q21.	The pipelining refers to
Option A:	prefetching instructions add storing in a FIFO queue
Option B:	Fetching instruction and data simultaneously
Option C:	executing different phases of two or more instructions in parallel
Option D:	executing different instructions in parallel using two or more computational units
Q22.	Symmetric impulse response having odd number of samples, N= 7 with center of symmetry α is equal to
Option A:	2
Option B:	5
Option C:	3.5
Option D:	3
Q23.	The condition for impulse response to be antisymmetric is
Option A:	h[n] = -h[N-1-n]
Option B:	h[n] = h[-n]
Option C:	h[n] = -h[-n]
Option D:	h[n] = h[N-1-n]
Q24.	Poles of a Butterworth filter lie on a circle with radius equal to
Option A:	3 dB cut off frequency
Option B:	Unity
Option C:	Stop band edge frequency
Option D:	Square of cut off frequency
Q25.	In DFT if time domain sequence is real and odd then its DFT will be
Option A:	Real and Even
Option B:	Imaginary and odd
Option C:	Real and odd
Option D:	Imaginary and even

Program: BE Electronics Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: EXC602 and Course Name: Advanced Instrumentation System

Time: 1 hour   Max. Marks: 50

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

Q1.	Data loggers are devices attached to sensors which
Option A:	Collect and store data over a period of time
Option B:	Collect data,store data and process it
Option C:	store data
Option D:	Collect and store data
Q2.	What are the two main types of controllers ?
Option A:	live and dead
Option B:	Continuous and discontinuous
Option C:	slow and fast
Option D:	stationary and non stationary
Q3.	_____is used for very small process system in industry
Option A:	Single Channel DAS
Option B:	Multi Channel DAS
Option C:	Data Logger
Option D:	Data Telemetry
Q4.	_____Telemetry is suitable for a distance about 300 meters or less
Option A:	Current Telemetry
Option B:	Voltage Telemetry
Option C:	Position Telemetry
Option D:	Impulse Telemetry
Q5.	Transmitters are classified based on
Option A:	Type of Signal
Option B:	Number of wires
Option C:	Type of Parameter
Option D:	None of the above
Q6.	_____is used between pressure regulator and the cylinder

Option A:	pump
Option B:	Control Valve
Option C:	filter
Option D:	storage tank
Q7.	The standard output range of current is considered as:
Option A:	3 to 15 psi
Option B:	3 to 15 mA
Option C:	4 to 20 mA
Option D:	4 to 20 A
Q8.	_____is used in hydraulic Power Plant
Option A:	pressure gauge
Option B:	Valve
Option C:	Reservoir
Option D:	filler gauge
Q9.	What is the function of a butterfly valve?
Option A:	On/ off control
Option B:	Flow regulation
Option C:	Pressure control
Option D:	Hydraulic control
Q10.	A constant back pressure is maintained at the time of rod extension in _____circuit
Option A:	Bleed-off speed control circuit
Option B:	Meter-in circuit
Option C:	On-off Circuit
Option D:	Meter-out circuit
Q11.	The other name of Check valve is :
Option A:	Non-return valve
Option B:	Gate valve
Option C:	Butterfly Valve
Option D:	Diaphragm Valve
Q12.	Which of the following is a convertor?
Option A:	Differential amplifier
Option B:	Current to Voltage
Option C:	RC circuit
Option D:	Instrumentation amplifier
Q13.	What is the necessity of Valve Positioner?
Option A:	To control valve made up of carbon steel
Option B:	To overcome spring forces
Option C:	To adjust the requested position

Option D:	For split body control valve
Q14.	Type 2 transmitter consists of how many wires
Option A:	4 wire
Option B:	1 wire
Option C:	3 wire
Option D:	2 wire
Q15.	Which of the following represents Flow Transmitter using suffix letter
Option A:	TX
Option B:	FC
Option C:	FT
Option D:	FR
Q16.	------------is not used in the pneumatic systems.
Option A:	cooler
Option B:	separator
Option C:	receiver
Option D:	water
Q17.	For long distance signal transmission which parameter is better and noise free?
Option A:	Voltage
Option B:	Current
Option C:	Wireless
Option D:	None of the above
Q18.	Which of the following is pneumatic actuator?
Option A:	Solenoid
Option B:	Relay
Option C:	Double acting cylinder
Option D:	Stepper motor
Q19.	Pneumatic systems use a ----------
Option A:	Water
Option B:	compressible gas
Option C:	Liquid
Option D:	Oil
Q20.	----------is the component of the primary air treatment unit of the pneumatic system.
Option A:	cooler
Option B:	lobe
Option C:	flapper nozzle
Option D:	receiver

Q21.	How many basic modes are there in continuous controller on which the whole control action takes place
Option A:	three
Option B:	two
Option C:	one
Option D:	four
Q22.	Derivative controller action is also called _____action.
Option A:	set
Option B:	reset
Option C:	offset
Option D:	rate
Q23.	Standard pneumatic signal range is---------.
Option A:	3-15mA
Option B:	4-20mA
Option C:	3-15psi
Option D:	4-20psi
Q24.	In which of these treatment systems diaphragm valves are preferred?
Option A:	Moving Bed Bioreactor(MBBR)
Option B:	Desalination
Option C:	Ultrafiltration
Option D:	Demineralization systems
Q25.	Pressure at the compressor outlet (which for practical purposes will be the same as that in the receiver) is called the --------------and is used to specify the compressor.
Option A:	standard pressure
Option B:	working pressure
Option C:	High Pressure
Option D:	Low Pressure

Time: 1 hour   Max. Marks: 50

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

Q1.	The forward break over voltage is the
Option A:	Anode-cathode voltage at which conduction starts with gate signal applied
Option B:	Anode-cathode voltage at which conduction starts with no gate signal applied
Option C:	Gate voltage at which conduction starts with no anode-cathode voltage
Option D:	Gate voltage at which conduction starts with anode-cathode voltage applied

Q2.	The waveform of the load current of a single-phase voltage source inverter is
Option A:	Sinusoidal
Option B:	Rectangular
Option C:	Trapezoidal
Option D:	Triangular

Q3.	A single phase half-wave controlled rectifier has 400 sin 314 t volts as the input voltage and resistor R is the load. For firing angle of 60° for the SCR, the average output voltage in volts is
Option A:	$400/\pi$
Option B:	$300/\pi$
Option C:	$240/\pi$
Option D:	$360/\pi$

Q4.	In resonant pulse inverters
Option A:	Dc output voltage variation is wide
Option B:	The frequency is low
Option C:	Output voltage is never sinusoidal
Option D:	Dc saturation of transformer core is minimized

Q5.	Calculate the output voltage of the Buck converter if the supply voltage is 789 V and duty cycle value is .9.
Option A:	711.1 V

Option B: 710.1 V
Option C: 722.2 V
Option D: 713.2 V

Q6.   A thyristor can be bought from the forward conduction mode to forward blocking mode by
Option A: The dv/dt triggering method
Option B: Applying a negative gate signal
Option C: Applying a positive gate signal
Option D: Applying a reverse voltage across anode-cathode terminals

Q7.   A Triac can pass a portion of _____ half-cycle through the load
Option A: Only positive
Option B: Only negative
Option C: Both positive and negative
Option D: None of the above

Q8.   In the MPM method, the comparator is given _____ and _____ types of waveform at its input.
Option A: Square, sine
Option B: Square, triangular
Option C: Sine, triangular
Option D: Square, quasi square

Q9.   If T is the time period for a chopper circuit and α is its duty cycle, then the chopping frequency is
Option A: Ton/α
Option B: Toff/α
Option C: α/Toff
Option D: α/Ton

Q10.   The dv/dt protection is provided in order to
Option A: Limit the power loss
Option B: Reduce the junction temperature
Option C: Avoid accidental turn-on of the device
Option D: Avoiding sudden large voltage across the load

Q11.   A fly-back converter operates in discontinuous conduction mode with fixed ON duration of the switch in each switching cycle. Assuming input voltage and the resistive load at the output to remain constant, how will the output voltage change with change in switching frequency? (Assume discontinuous conduction throughout and neglect circuit losses.)
Option A: Output voltage varies directly with switching frequency.

Option B: Output voltage varies inversely with switching frequency.

Option C: Output voltage varies directly with square root of switching frequency.

Option D: Output voltage is independent of switching frequency

Q12.   Natural commutation of an SCR takes place when

Option A: Voltage across the device becomes negative

Option B: Voltage across the device becomes positive

Option C: Gate current becomes zero

Option D: Anode current becomes zero

Q13.   A single-phase full converter bridge is connected to a RLE load. The source has a rms voltage of 230 V and the average load current is 10 A. Find the firing angle for which the power flows from the DC load to the AC source. Consider E = 120 V, R = 0.4 Ω, L = 2 Henry.

Option A: 124°

Option B: 153°

Option C: 142°

Option D: 309°

Q14.   In a single-phase half-wave circuit with RL load and a freewheeling diode, the load voltage during the freewheeling period will be

Option A: Zero

Option B: Positive

Option C: Negative

Option D: Positive than negative

Q15.   In case of class B commutation or resonant-pulse commutation with L = 5 μH and C = 20 μC with the initial voltage across the capacitor (Vs) = 230 V. Find the conduction time for auxiliary thyristor.

Option A: 0.23 μs

Option B: 6.57 μ

Option C: 31.41 μs

Option D: 56 μs

Q16.   The GTO (gate turn-off thyristor) is a _____.

Option A: P-N-P-N device

Option B: P-N-P device

Option C: P-metal-N device

Option D: P-N single junction device

Q17.   In the method of phase control, the phase relationship between ___ & ___ is controlled by varying the firing angle

Option A: Supply current, supply voltage

Option B: End of the load current, end of the load voltage
Option C: Start of the load current, start of the load voltage
Option D: Load current, load voltage

Q18.   Integral cycle control is also known as
Option A: Cyclo converter
Option B: Rectifier
Option C: Inverter
Option D: On-Off Control

Q19.   In the three-phase bridge inverter, each step consists of
Option A: 30°
Option B: 60°
Option C: 90°
Option D: Will depend on the value of the firing angle

Q20.   A GTO can be represented by two transistors T1 & T2. The current gain of both transistors are α1 and α2 respectively. A low value of gate current requires _____.

Option A: Low value of α1 and α2
Option B: Low value of α1 and high value of α2
Option C: High value of α1 and low value of α2
Option D: High values of α1 and α2

Q21.   In controlled rectifiers, the nature of load current i.e. continuous or discontinuous depend upon

Option A: Type of load and firing angle
Option B: Only on type of load
Option C: Only on firing angle
Option D: Does not depend on load

Q22.   The finger voltage of an SCR is
Option A: Minimum value of Vak to turn on the device with gate triggering
Option B: Maximum value of Vak to turn on the device with gate triggering
Option C: Minimum value of Vak to turn on the device without gate triggering
Option D: Maximum value of Vak to turn on the device without gate triggering

Q23.   The TRIAC can be represented by _____.
Option A: Two SCRs in anti-parallel
Option B: Two SCRs in parallel
Option C: Two diodes in anti-parallel
Option D: Two diodes in parallel

Q24.   What is the pulse width of the Multiple Pulse Width Modulation method, if the amplitudes of the reference wave and the carrier wave are made equal.

Option A: ∞
Option B: 0
Option C: 100 °
Option D: None of the mentioned.

Q25.   A single-phase half wave voltage controller consists of
Option A: One SCR is parallel with one diode
Option B: One SCR is anti-parallel with one diode
Option C: Two SCRs in parallel
Option D: Two SCRs in anti-parallel