Roll No.

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST 1

Sem & AY: Odd Sem. 2019-20
Course Code: ECE 202
Course Name: SIGNALS AND SYSTEMS
Program & Sem: B.Tech (ECE&EEE) & III

Date: 30.09.2019
Time: 11:00 AM to12:00 PM
Max Marks: 40
Weightage: 20%

Instructions:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted.

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries six marks. (2Qx6M=12M)

1. The system whose input and output defined with the mathematical equation y[n] = 2 x[-n/2] + x[n-2] check whether the system is Dynamic or Static, Causal or Non Causal and Time invariant or Time varying.
(C.O.NO.1) [Comprehension]
2. Sketch the following signal $x(t) = \sin(2\pi t)u(t)$ and find the fundamental angular frequency of the signal x(t). (C.O.NO.1) [Comprehension]

Part B [Thought Provoking Questions]

Answer all the questions. Each Question carries eight marks. (2Qx8M=16M)

3. A system which satisfies superposition principle and the shift in the response will be same as shift in the excitation is ready to process any arbitrary signal which can be expressed as weighted sum of delayed unit impulses whose magnitude exists at integer values of time. Identify the system, what will be the response of the system based on the input and its characteristics as defined.
(C.O.NO.1) [Application]

4. Sketch the following signals x(t) & x(-2t+2) where $x(t)= e^{-a|t|}$ [u(t+4)-u(t-4)] find even and odd components of x(t). (C.O.NO.1) [Comprehension]

Part C [Problem Solving Questions]

Answer the question. The Question carries twelve marks (1Qx12M=12M)

5. Sketch and check whether the signal x(t) defined below is an energy signal power signal and neither energy nor power signal.
Where x(t) = r(t) = t u(t). (C.O.NO.1) [Comprehension]

SCHOOL OF ENGINEERING

Semester: ODD

Course Code: ECE 202

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Max Marks: 40

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Date:

Time:

Max Marks:

Weightage:

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [12Marks] Bloom's Levels			Thought provoking type [16Marks] Bloom's Levels			Problem Solving type [12Marks]			Total Marks
			K			C			A			
1	CO1	M1				✓						6
2	CO1	M1				✓	✓	✓				6

Application Level

3	CO1	M1				✓						8
4	CO1	M1				✓						8
5	CO1	M1				✓						12
	Total Marks											40

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

I here certify that All the questions are set as per the above lines Mr . Sunil kumar Dasari .]

Reviewer's Comments :

(1) Everything O.K. except solution for "Part C" missing.

(2) In Q.P. after fullstop, Space should come.

(3) Question NO - 03 should be considered as "Application Level"

Annexure- II: Format of Answer Scheme

SCHOOL OF ENGINEERING

SOLUTION-TEST-1

Semester: ODD

Course Code: ECE202

Course Name: SIGNALS AND SYSTEMS

Date: 30-09-2019

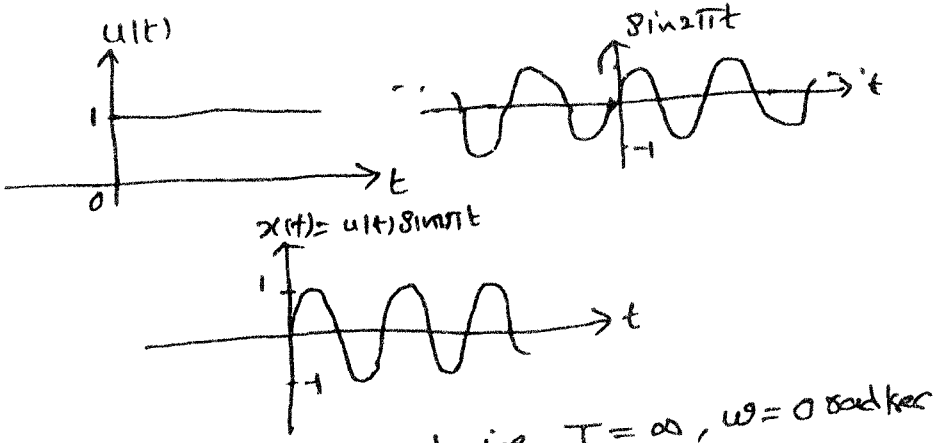
Time: 11:00AM -12:00PM

Max Marks: 40

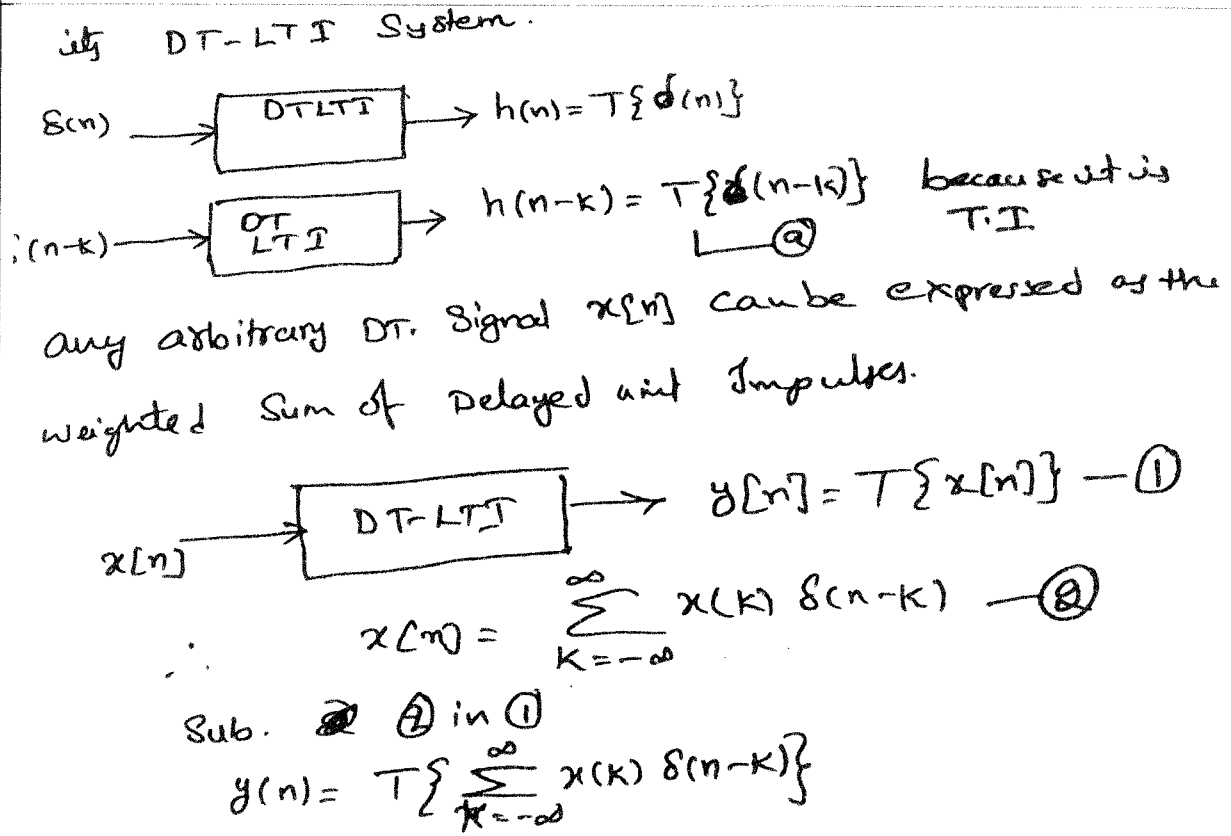
Weightage: 20%

Part A (2Q x6 M =12 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question

1.	$y(n) = 2x(-n/2) + x(n-2)$ → Dynamic } prop/p → Non-causal } Depends on past & future inputs → Time varying → fails to satisfy Time Invariant condition.	2+2+2	6
2	 x(t) is aperiodic signal, i.e $T = \infty$, $\omega = 0$ rad/sec	**Sketching 4 marks** **Aperiodic signal 1 mark** **Angular frequency ZERO saying that aperiodic signal may be treated as periodic signal with infinity Time period-1 mark**	**6**

Part B (2Q x8 M = 16 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1		DT LTI-1M DERIVATION-7	15

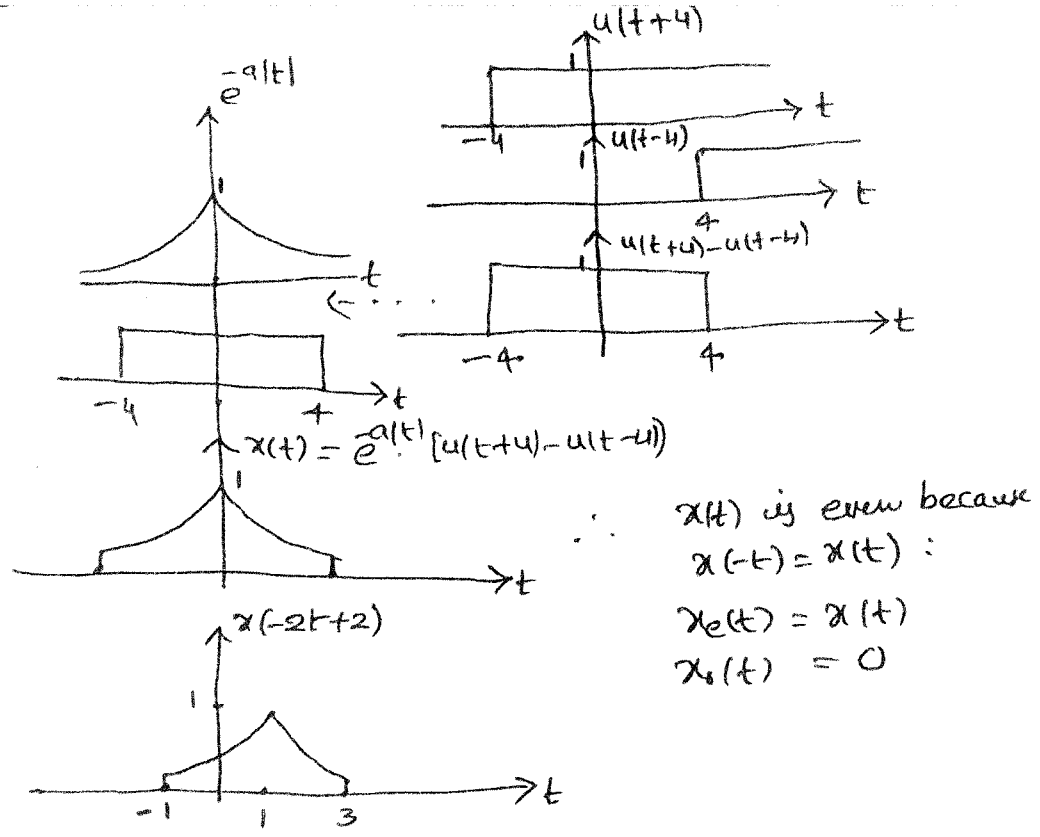
$$y[n] = \sum_{k=-\infty}^{\infty} x(k)\, T\{\delta(n-k)\}$$

using eq-②

$$y[n] = \sum_{k=-\infty}^{\infty} x(k)h(n-k)$$

is called as convolution Sum.

$\therefore$ $y[n] = x[n] * h[n]$.

2	 ∴ x(t) is even because x(-t) = x(t) : $x_e(t) = x(t)$ $x_o(t) = 0$	SKETCHES $e^{-a\|t\|}$ -1MARK [u(t+4)-u(t-4)] -1 MARK $x(t)= e^{-a\|t\|}$ [u(t+4)-u(t-4)]-1 MARK x(-2t+2)- 3 Marks even part-1 M odd part -1M	15

Roll No.													

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

TEST – 2

Sem & AY: Odd Sem 2019-20
Course Code: ECE 202
Course Name: SIGNALS AND SYSTEMS
Program & Sem: B.Tech (ECE&EEE) & III

Date: 18.11.2019
Time: 11:00 AM to 12:00 PM
Max Marks: 40
Weightage: 20%

Instructions:

(i) Read the questions carefully and answer all the questions.
(ii) Scientific calculator is permitted.

Part A [Memory Recall Questions]

Answer both the Questions. Each Question carries six marks. (2Qx6M=12M)

1. Fourier series representation is applied to which class of signals? Describe in brief. (C.O.NO.2) [Knowledge]
2. Write $x(t)=3+4\sin(3\omega_0 t)+5\cos(4\omega_0 t)$ using Fourier Series and identify the coefficients and write their conjugates.

(C.O.NO.2) [Knowledge]

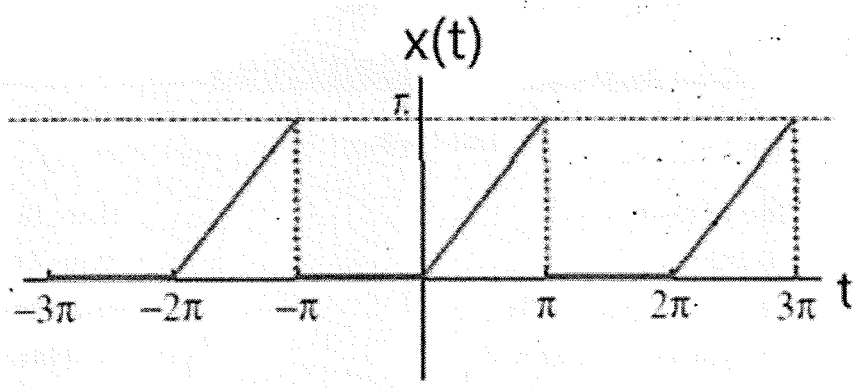
Part B [Thought Provoking Questions]

Answer both the Questions. Each Question carries eight marks. (2Qx8M=16M)

3. Consider two periodic signals x(t) and y(t) with Fourier series coefficient pair a_k and b_k respectively, having same fundamental angular frequency $\omega_0 = 2\pi/T$. Find the Fourier series coefficient of the convolved signal $(x(t)*y(t))$.

(C.O.NO.2) [Knowledge]

4. Find the Fourier series coefficients and determine Fourier series representation of the signal x (t).



(C.O.NO.2) [Knowledge]

Part C [Problem Solving Questions]

Answer the Question. The Question carries twelve marks. (1Qx12M=12M)

4. What will be the the output of the LTI system for the given input x(n) through graphical method, given the impulse response of the system h(n) .

   x(n)={ 1, 3, 5} h(n)={2, 6, 4}
   ↑ ↑

(C.O.1) [COMPREHENSION]

SCHOOL OF ENGINEERING

Semester: ODD

Course Code: ECE 202

Course Name: Signals & Systems

Date: 18.11.2019

Time: 11.00AM-12.00PM

Max Marks: 40

Weightage: 20%

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO	Unit/Module Number/Unit /Module Title	Memory recall type [12Marks] Bloom's Levels			Thought provoking type [16Marks] Bloom's Levels			Problem Solving type [12Marks]			Total Marks
			K			C			A			
1	CO2	M2	6									6
2	CO2	M2	6									6
3	CO2	M2					8					8
4	CO2	M2					8					8
5	CO1	M1						12				12
	Total Marks		12				16	12				40

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

Annexure- II: Format of Answer Scheme

SCHOOL OF ENGINEERING

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

SOLUTION

Semester: ODD

Course Code: ECE202

Course Name:Signals & Systems

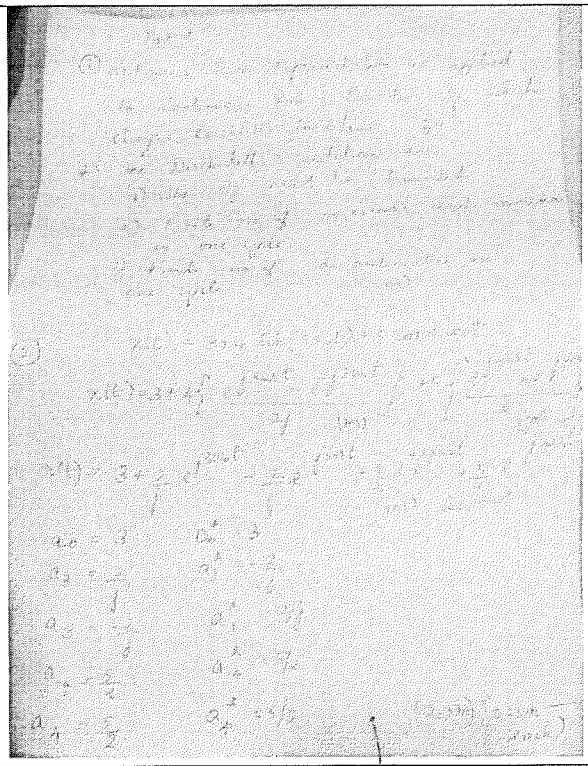
Date: 18.11.2019

Time: 11.00 AM-12.00AM

Max Marks: 40

Weightage: 20%

Part A (2Q x 6M = 12Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
1)		3m+3m	5min
2)		1m+1m+1.5m+2.5m	5min

Please write
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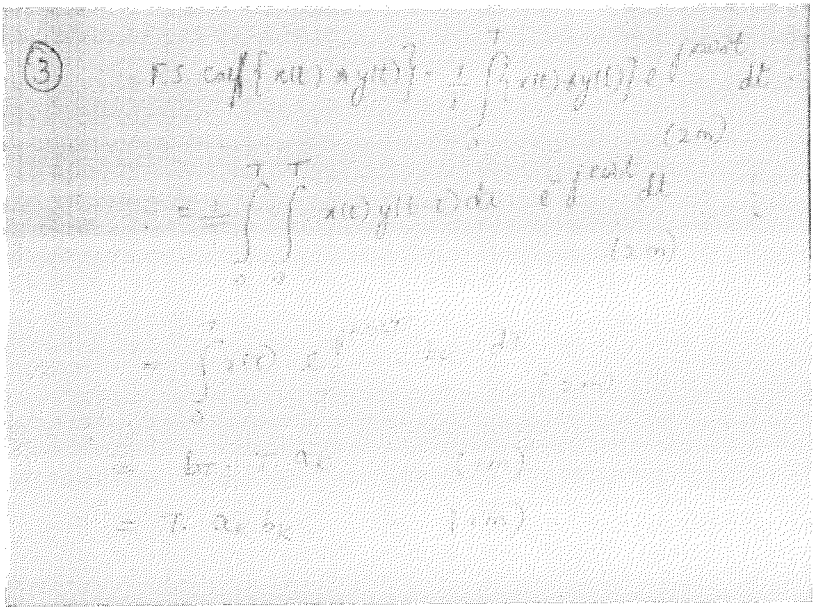
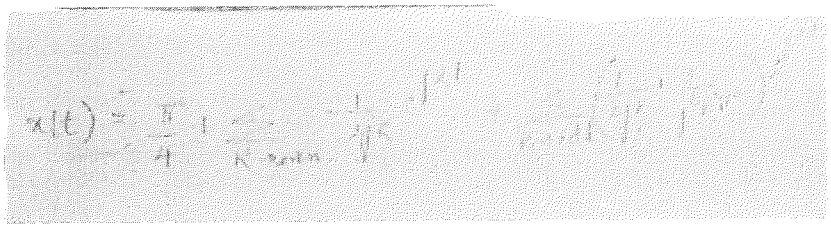
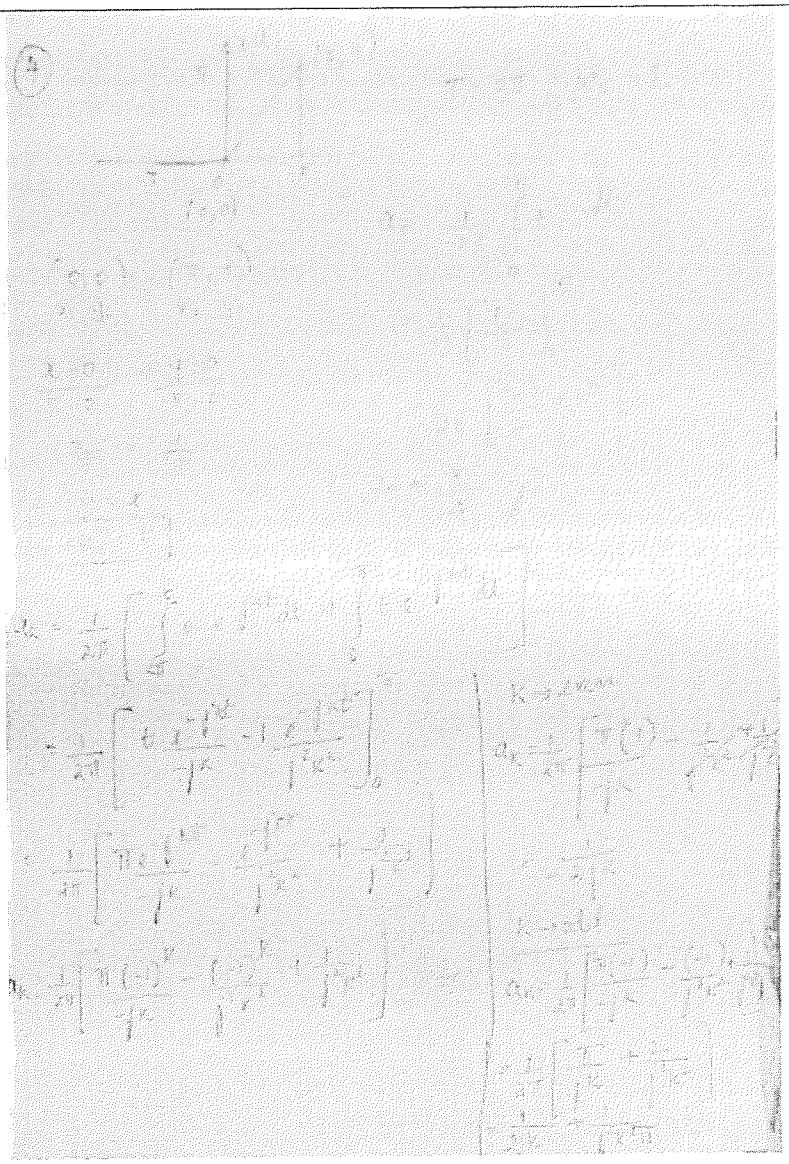
instead of picture, Not Readible

Part B (2Q x 8M =16 Marks)

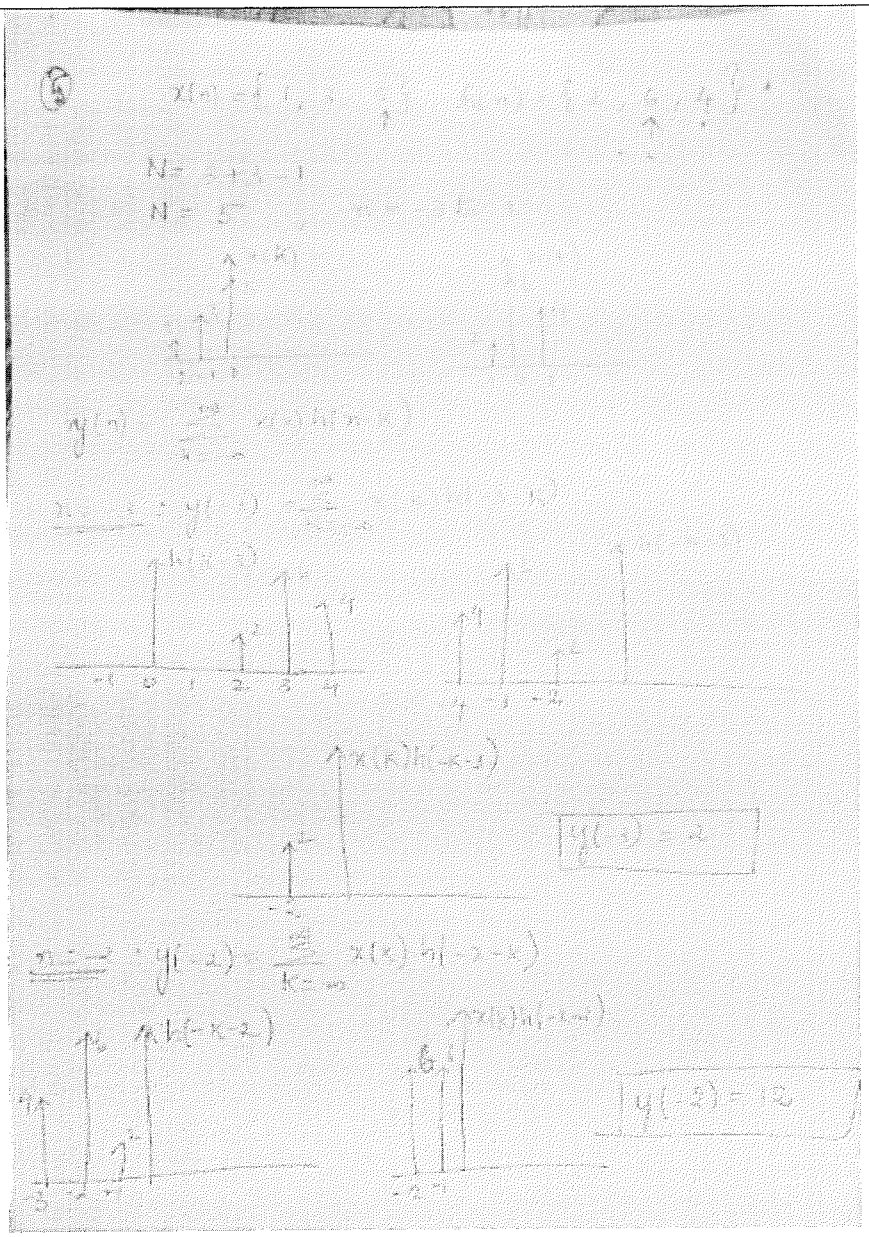
Q No	Solution	Scheme of Marking	Max. Time required for each Question
3)		2m+2m+2m+1m+1m	8min
4)		2m+2m+2m+2m	8min

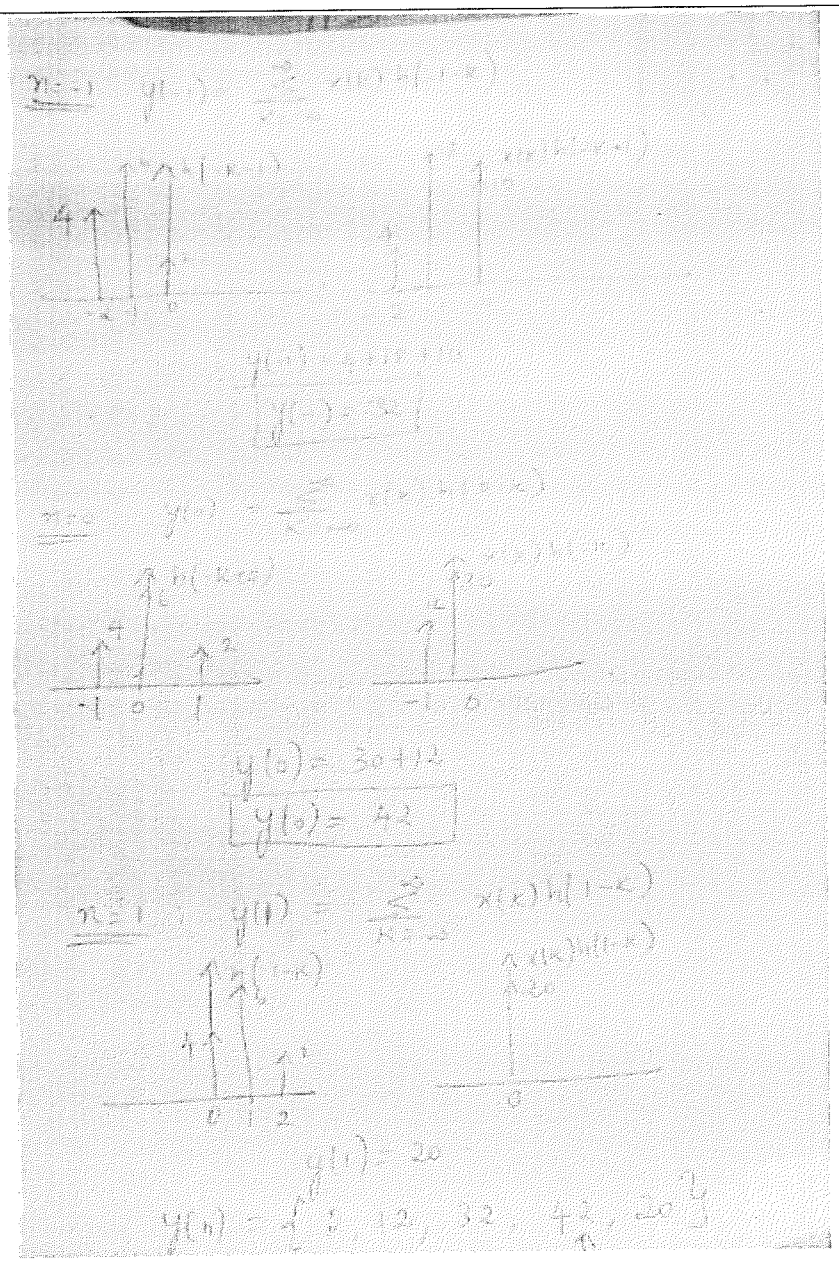


Part C (1Q x 12M =12 Marks)

Q No	Solution	Scheme of Marking	Max. Time required for each Question
5)		5*2m+2m	15min

(5)





Roll No												

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SCHOOL OF ENGINEERING

END TERM FINAL EXAMINATION

Semester: Odd Sem. 2019 - 20
Course Code: ECE 202
Course Name: SIGNALS AND SYSTEMS
Program & Sem: B.Tech(ECE/EEE) & III

Date: 24 December 2019
Time: 1:00 PM to 4:00 PM
Max Marks: 80
Weightage: 40%

Instructions:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted.

Part A [Memory Recall Questions]

Answer all the Questions. Each Question carries 4 marks. (6Qx4M=24M)

1. Represent the following signals (both Continues and discrete) with functional and graphical Representations (C.O.No.1) [Knowledge]

   i) Unit Step ii) Ramp

2. With Suitable Mathematical Equations Explain Energy and power of Signal (both Continues and discrete) (C.O.No.1) [Knowledge]

3. Explain the following (C.O.No.2) [Knowledge]

   i) Static and Dynamic System ii) Causal and Non-Causal System

4. Sketch the bellow given signal (C.O.No.4) [Knowledge]

   X(t)=Sin(wt)*U(t-1)*U(9-t)

5. Discuss the stability of the system by considering the system function H(s) (C.O.No.3) [Knowledge]

6. State the following Fourier series properties (C.O.No.2) [Knowledge]

   i) Time shifting property ii) Parseval's Identity

Part B [Thought Provoking Questions]

Answer both the Questions. Each Question carries 12 marks. (2Qx12M=24M)

7. What will be the response of the system whose impulse response is [1 2 2] and for the input $\underset{\uparrow}{[-2 \quad 1 \quad 2 \quad 3 \quad -1 \quad 2]}$ use graphical representation method. (C.O.No.2) [Application]

8. Compare Fourier Transform, Discrete time Fourier Transform, Laplace Transform, Z-Transform and Identify, is there any common computational factor? (C.O.No.3,4) [Comprehension]

Part C [Problem Solving Questions]

Answer both the Questions. Each Question carries 16 marks. (2Qx16M=32M)

9. State and Prove the following Fourier Transform Properties (C.O.No.3) [Comprehension]

   i) Frequency shifting.

   ii) Time shifting.

   iii) Differentiation in time domain.

   iv) Convolution

10. a) find Z-Transform of following signals (C.O.No.3,4) [Comprehension]

   i) X(n)=Cos(w*n) U(n) ii) X(n)= a^n Sin(w*n) U(n)

   b) Find Discrete time Fourier Transform of following signals

   i) X(n) = $\left(\frac{1}{2}\right)^n$ U(n) ii) X(n)=n U(n)

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

SCHOOL OF ENGINEERING

END TERM FINAL EXAMINATION

Semester: Odd Sem. 2019-20
Course Code: ECE202
Course Name: SIGNALS AND SYSTEMS
Program & Sem: B.Tech(ECE,EEE) & 3th Sem

Date: 24th December 2019
Time: 1.00 PM to 4.00 PM
Max Marks: 80
Weightage: 40%

Extract of question distribution [outcome wise & level wise]

Q.NO.	C.O.NO (% age of CO)	Unit/Module Number/Unit /Module Title	Memory recall type [Marks allotted] Bloom's Levels	Thought provoking type [Marks allotted] Bloom's Levels	Problem Solving type [Marks allotted]	Total Marks
			K	C	A	
1	1	Module 1	4			4
2	1	Module 1	4			4
3	2	Module 2	4			4
4	4	Module 4	4			4

5	3	Module 3	4			4
6	2	Module 2	4			4
7	2	Module 2			12 ✓	12
8	3,4	Module 3,4		12		12
9	3	Module 3		16		16
10	3,4	Module 3,4		16		16
	Total Marks		24	44	12	80

K =Knowledge Level C = Comprehension Level, A = Application Level

Note: While setting all types of questions the general guideline is that about 60%

Of the questions must be such that even a below average students must be able to attempt, About 20% of the questions must be such that only above average students must be able to attempt and finally 20% of the questions must be such that only the bright students must be able to attempt.

I hereby certify that all the questions are set as per the above guidelines.

Faculty Signature:

Reviewer Comment: Thought Provoking Questions should be designed as per guidelines, from next sem.
Please avoid typing mistakes.

17/12/19