Enroll. No._____

MARWADI UNIVERSITY
MU-FOT
ICT-FOT1 (MU)
Semester 3 - Winter

Subject : SS (01CT0302) **Date : 25-Aug-2021**
Total Marks : 30 **Time : 1 Hours 15 Minutes**

Instructions :

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Que.1 (A) **Answer the following questions.** **[6]**

(1) Determine whether continuous time LTI system with impulse response $h(t) = e^{-4t}u(t-2)$ is stable or not.

(2) What is meant by linear system?

(3) Define invertible system.

(4) Prove that $\delta[n] = u[n] - u[n-1]$.

(5) Distnguish between energy and power signal.

(6) Define Nyquist rate and Nyquist interval.

Que.2

(A) Sketch the following signals: [6]
(i) u(-t+2), (ii) -2u(t+2) and (iii) 2r(t-2)

(B) Calculate and plot response of LTI system with impulse response $h(t) = u(t)$ for input $x(t) = e^{-at}u(t), a > 0$. [6]

OR

(B) Draw block diagram representations for causal LTI systems described by following differential equations: [6]
i. $y(t) = -(1/2)(dy(t)/dt) + 4x(t)$
ii. $(dy(t)/dt) + 3y(t) = x(t)$

Que.3

(A) Determine whether following statements concerning LTI systems are True or False: [8]
i. If $h(t)$, impulse response of LTI system is periodic and non-zero then the system is unstable.
ii. The inverse of a causal LTI system is always causal.
iii. If LTI system is causal, it is stable.
iv. A continuous time LTI system is stable if and only if its step response $s(t)$ is absolutely integratable.

(B) Define Signal. With example explain classification of signal in detail. [4]

OR

(A) Discuss Aliasing and demonsrate solution for Aliasing during sampling and reconstruciton. [8]

(B) Discuss properties of continuous time LTI systems. [4]

---Best of Luck---

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Difficulty Level	Weightage		No of Question	Total Marks	Question List
	Recommended	Actual			
High	20	29.17	2	14	2(B), 3(A)
Low	20	20.83	3	10	1(A), 3(A)
Medium	60	50.00	8	24	1(A), 2(A), 2(B), 3(B)

Module Name	Weightage		No of Question	Total Marks	Question List
	Recommended	Actual			
Continuous time and discrete time signals and systems	50	45.83	7	22	1(A), 2(A), 3(A), 3(B)
Analysis of Continuous Time Signals and Systems	50	54.17	6	26	1(A), 2(B), 3(A), 3(B)

Blooms Taxonomy	Weightage		No of Question	Total Marks	Question List
	Recommended	Actual			
Remember / Knowledge	20	2.08	1	1	1(A)
Understand	30	12.50	3	6	1(A), 3(B)
Apply	25	37.50	3	18	2(B), 3(A), 3(B)
Analyze	15	20.83	3	10	1(A), 3(A)
Evaluate	10	27.08	3	13	1(A), 2(A), 2(B)
Higher order Thinking	0	0.00	0	0