

B.TECH.  
 Year: 2<sup>nd</sup> Semester: 4<sup>th</sup>  
 MINOR TEST (EXAMINATION): 2025-2026  
 SIGNAL & SYSTEMS  
 Course Code -BEC-260

Max. Time: 2 Hr.  
 Note- Answer all questions

Marks: 30

Q1.	Attempt any Three parts of the following.	Marks	CO	BL	PO	PI Cod
a)	Sketch the following for the given signal $x(t)$ : (i) $x(2-t)$ (ii) $\frac{d}{dt}x(t)$	4	CO1	3	PO1	1.3.1
b)	A system is defined by an input-output relation with input $x$ and output $y$ . Examine whether the system is LTI. (i) $y(t) = a_0 + b_0x(t) + x(t)^2$ (ii) $y[n] = x[2n]$	4	CO1	2	PO1	1.3.1
c)	Find Fourier series coefficients of the given periodic signal $x(t)$ : 	4	CO2	2	PO1	1.3.1
d)	Find Fourier transform of the signal $x(t)$ . Can we represent this $x(t)$ as the form of Fourier series? Justify your answer. $x(t) = \begin{cases} \cos \pi t & \text{for } -\frac{1}{2} \leq t \leq \frac{1}{2} \\ 0 & \text{else} \end{cases}$	4	CO2	3	PO1	1.3.1
Q2.	Attempt any Three parts of the following.					
a)	Check whether the following signals are periodic. If so, determine the period. (i) $x(t) = 3\cos\left(\frac{2\pi}{5}t\right)u(t)$ (ii) $x(t) = a\sin 4t + b\cos 7t$ (iii) $x[n] = \cos\left(\frac{\pi}{8}n^2\right)$	3	CO1	2	PO1	1.3.1
b)	Consider the discrete time signal. $x[n] = 1 - \sum_{n=3}^{\infty} \delta(n-1-k)$ Determine the values of the integers $M$ and $n_0$ so that $x(n)$ may be expressed as $x(n) = u(nM - n_0)$ .	3	CO1	2,3	PO1	1.3.1
c)	(i) An LTI system has impulse response $h[n] = \{1, 2, 1, -2\}$ . Find the output for the input $x[n] = \{1, 3, 2, 1\}$ . (ii) DTFT of a function $x[n]$ is $X(e^{j\omega}) = \cos\left(\frac{\omega}{5}\right)$ , find the value of $x[0]$ .	3	CO1	2	PO1	1.3.1