Name:
Student University Roll No.:

Printed Pages:

School of Engineering
Second Theory Sessional Examination
Odd Semester (AS: 2024-25)

B. Tech: All Branches [Year: II] [Semester: III]

Course Title: Complex Analysis and Integral Transforms
Course Code: NBS 4301

Max Marks: 30
Time: 1hrs

Instructions if any: Read the question Carefully.

SECTION 'A' Q.N.1. Attempt all parts of the following:		Course Objective	Marks
a)	Write the Z- Transform of sequence $\{f_k\}$.	CO 4	1
b)	Prove that $L\{1\} = \frac{1}{s}$.	CO 3	1
c)	State the Fourier Integral.	CO 4	1
d)	Evaluate $L\{t^3 e^{-3t}\}$.	CO 3	1
e)	Evaluate $L^{-1}\left\{\frac{1}{s+a}\right\}$.	CO 3	1
SECTION 'B' Q.N.2. Attempt any two parts of the following:		**Course Objective**	**Marks**
a)	Using Convolution theorem evaluate $L^{-1}\frac{s}{(s^2+1)(s^2+4)}$.	CO 3	7.5
b)	Find the Laplace transform of $\frac{\cos at - \cos bt}{t}$.	CO 3	7.5
c)	Solve by Z- transform: $y_{k+1} + y_k = 1 \quad if\ y_0 = 0$.	CO 4	7.5
SECTION 'C' Q.N.3. Attempt any one part of the following:		**Course Objective**	**Marks**
a)	Express the function $f(x) = \begin{cases} 1 & \lvert x\rvert \le 1 \\ 0 & \lvert x\rvert > 1 \end{cases}$ as a Fourier Integral. Hence evaluate $\int_0^\infty \frac{\sin\lambda\cos\lambda x}{\lambda} d\lambda$.	CO4	10
b)	Solve using Laplace Transform $y''(t) + 4y'(t) + 4y(t) = 6e^{-t}$ $y(0) = -2, y'(0) = 8$.	CO3	10
c)	Find Fourier Sine Transform of function e^{-ax}.	CO4	10

Table 1: Mapping between COs and questions
(Number of COs may vary from course to course)

COs	Questions Numbers	Total Marks
CO 3	1(b),1(d),1(e), 2(a), 2(b), 3(b)	28
CO 4	1(a), 1(c), 2(c), 3(a), 3(c)	29.5

30/11/24