Exam No.____________

GANPAT UNIVERSITY

B. Tech. (CE/IT) Semester – IV CBCS (NEW) Regular Examination – May 2017

Sub : (2HS401) Mathematics for Computer Engg. & Information Tech.

TIME: 03 Hrs **TOTAL MARKS : 60**

Instructions :

1. All questions are compulsory.
2. Write answer of each section in separate answer books.
3. Figures to the right indicate marks of questions.

SECTION – I

Que – 1

(A) Evaluate : (i) $L\{e^{-2t}\sin^2 t\}$ (ii) $L^{-1}\left\{\frac{3s+7}{s^2-2s-3}\right\}$ (4)

(B) Apply Convolution theorem to evaluate $L^{-1}\left\{\frac{1}{(s+3)(s-4)}\right\}$. (3)

(C) Express the given function in terms of Unit step function & hence obtain its Laplace transforms : $f(t)=\begin{cases} 0 & ; \ t<2 \\ e^t & ; \ t\ge 2 \end{cases}$. (3)

OR

Que – 1

(A) Evaluate : (i) $L\left\{\frac{e^{-at}-e^{-bt}}{t}\right\}$ (ii) $L\{t\,e^{2t}\cos t\}$ (4)

(B) If $L\{f(t)\} = \overline{f(s)}$ then Prove that $L\left\{\frac{f(t)}{t}\right\} = \int_s^{\infty} \overline{f(s)}\,ds$. (3)

(C) Evaluate : $L^{-1}\left\{\log\left(\frac{s-2}{s+3}\right)\right\}$ (3)

Que – 2

(A) Expand $f(x)=\begin{cases} 0 & ; \ -\pi<x<0 \\ \pi x/4 & ; \ 0<x<\pi \end{cases}$ as a Fourier series. (4)

Hence deduce that : $\frac{\pi^2}{8} = \frac{1}{1^2}+\frac{1}{3^2}+\frac{1}{5^2}+\cdots\cdots$

(B) Obtain Fourier series for $f(x)=x^2$; $-1<x<1$. (3)

(C) Expand $f(x)=\left(\frac{\pi-x}{2}\right)^2$; $0\le x\le 2\pi$ as a Fourier series . (3)