SY-IT

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination –Oct. 2019

Course: S.Y. B. Tech.ALL **Sem:III**

Subject Name: Engineering Mathematics-III **Subject Code:BTBS301**

Max. Marks: 20 **Date: 03.10.2019** **Duration: 1Hr.**

Instructions: 1. All questions are compulsory.
2. Use of nonprogrammable calculator is allowed.
3. Figures to right indicate full marks.

Q1. Attempt the following. **(6Marks)**

a) Find Laplace transform of $e^{-3t}t^4$ co1

i) $\frac{4}{(s+3)^5}$ ii) $\frac{5!}{(s+3)^5}$ iii) $\frac{4!}{(s+3)^5}$ iv) $\frac{4!}{(s+3)^4}$

b) The Laplace transform of $sin2t\ \delta(t-2) is$ co1

i) $e^{-2s}sin2$ ii) $e^{-2s}sin4$ iii) $e^{-4s}sin4$ iv) $e^{-2s}sin4s$

c) Find Inverse Laplace Transform of $\left[\frac{s^2-3s+4}{s^3}\right]$ co2

i)$t-3t+2t^2$ ii) $1-3t+4t^2$ iii) $1-6t+2t^2$ iv) $1-3t+2t^2$

d) $L^{-1}\left[\frac{1}{s}\overline{f(s)}\right] =$ - - - co2

i) $t\int_0^t f(t)dt$ ii) $e^{-t}\int_0^t f(t)dt$ iii) $\int_0^\infty f(t)dt$ iv) $\int_0^t f(t)dt$

e) If F(λ) is Fourier transform of f(x) then Fourier transform of f(ax) is co3

i) $\frac{1}{a}F(\frac{\lambda}{a})$ ii) $F(\frac{\lambda}{a})$ iii) $\frac{1}{a}F(a)$ iv) $\frac{1}{a}F(\frac{a}{\lambda})$

f) Fourier cosine transform of $f(t)=e^{-2t}$ is co3

i) $\sqrt{\frac{2}{\pi}}\frac{2s}{s^2+4}$ ii) $\sqrt{\frac{2}{\pi}}\frac{s}{s^2+4}$ iii) $\sqrt{\frac{2}{\pi}}\frac{1}{s^2+4}$ iv) $\sqrt{\frac{2}{\pi}}\frac{2}{s^2+4}$

Q2. Attempt any Two of the following. **(6Marks)**

(A) Find L{ $e^{3t}\int_0^t t\,sint\,dt$} co1

(B) Find Inverse Laplace Transform of $log\left(\frac{s^2+16}{s^2+9}\right)$ co2

(C) Find Fourier cosine transform of e^{-3x} co3

Q3. Attempt any ONE. **(6Marks)**

(A) Solve $\frac{dy}{dt}+x=cost$, $\frac{dx}{dt}+y=Sin\,t$
such that $y(0)=2, x(0)=0$ *by Laplace transform* co2

(B) Find f(x) if $F_s(\lambda)=\frac{e^{-a\lambda}}{\lambda}$ co3