

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI  
 CLASS TEST – 2 Winter-2012

B. Tech. CIVIL and MECH(D A./Branch change students)

Course: SHU301 Engineering Mathematics-III

Max. Marks: 15

*Instructions: Attempt any five questions.*

Que 1) Find Laplace transform of i)  $f(t) = \begin{cases} 1, & 0 \leq t < 1 \\ t, & 1 \leq t < 2 \\ t^2, & 2 \leq t < \infty \end{cases}$  ii)  $F(t) = \begin{cases} (t-1)^3, & t > 1 \\ 0, & 0 < t < 1 \end{cases}$

Que 2) State first and second shifting theorem. Given  $L\left(2\sqrt{\frac{t}{\pi}}\right) = \frac{1}{s^{3/2}}$ , Show that  $L\left(\frac{1}{\sqrt{\pi t}}\right) = \frac{1}{\sqrt{s}}$ .

Que 3) State convolution theorem and verify it for the functions  $f(t) = t^2$ ,  $g(t) = \sin at$

Que 4) Find Laplace transform of  $y(t)$  and hence  $y(t)$  if  $\frac{d^2 y}{dt^2} + 2 \frac{dy}{dt} + 5y = e^{-t} \sin t$

with  $y(0) = 0$ ,  $y'(0) = 1$ .

Que 5) Evaluate: i)  $\int_0^\infty \left( \frac{e^{-t} - e^{-3t}}{t} \right) dt$ , ii)  $\int_0^\infty \frac{e^{-2t} \sinh t}{t} dt$

Que 6) Using partial fraction find  $L^{-1}\left\{ \frac{3s^3 + s^2 + 12s + 2}{(s-3)(s+1)^3} \right\}$

$$4xyz = pq + 2px^2y + 2qxy^2$$

$$2xp^2 + 2xq^2$$

$$p = yP + Q$$

$$q = xP + a$$

$$4z = \frac{(yP+Q)(xP+Q) + 2xyP^2}{xy} + 2x^2yP^2 + 14$$

$$4z = \frac{pq}{xy} + 2px + 2qy$$

GOVERNMENT COLLEGE OF ENGINEERING.  
(An autonomous institute of Govt. of Maharashtra)

CT-II

W-2014

MARKS-15

TIME-1 HOUR

$4z = \frac{\partial z}{\partial x} + \frac{1}{y} \frac{\partial z}{\partial y} + 2px + 2qy$  SHU301, SHU303, SU304 ENGG.MATHS-III [ Civil/Mech/ELPO/EXTC/CS/IN/IT ]

Q.1 Solve by using the Separation of variables method

$$u_{xx} = u_y + 2u, \quad u(0, y) = 0, \quad \frac{\partial}{\partial x} u(0, y) = 1 + e^{-3y}$$

Q.2 Solve  $(z - xp - yq)^{\frac{1}{2}} = a(x^2 + y^2 + z^2)$

Q.3 ATTEMPT ANY THREE

(A) Solve  $pq = x^m y^n z^l$  ③

(B) Solve  $2x^{\frac{1}{2}} y^{\frac{1}{2}} z^{\frac{1}{2}} = (pq + 2px^2y + 2qxy^2)^{\frac{1}{2}}$

(C) Solve  $(x+y)(p+q)^2 + (x-y)(p-q)^2 = 1$  ③

(D) Solve  $yp = 2yx + \log q$  ③

$$\frac{dt}{dx} + \frac{dx}{dt}$$

$$2 - a^2 t^2 - 1/t - a^2 z t^2$$

$$t + 2 - 1$$

Que5) Evaluate:

$$\text{i) } \int_{-\infty}^{\infty} \left| \frac{e^{-t} - e^{-3t}}{t} \right| dt$$

$$\text{ii) } \int_{-\infty}^{\infty} \frac{e^{-2t} \sinh t}{t} dt$$

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI  
 (An autonomous institute of Govt. of Maharashtra)

CT-II

W-2015

MARKS-15

TIME-1 HOUR

SHU303 ENGG. MATHS-III [ELPO/EXTC /IN]

Q.1 Solve by using the Separation of variables method

$$u_{xx} - 2u = u_y, \quad u(0, y) = 0 \quad \frac{\partial}{\partial x} u(0, y) = 1 + e^{-3y}$$

Q.2 Solve  $p = \sqrt{\frac{1 - y^2(p^2 + q^2)}{x^2}} - q^2$

Q.3 ATTEMPT ANY THREE

(A) Solve  $p(1 + q^2) = q(z - a)$

(B) Solve  $x = \frac{4xyz - pq}{2y(px + qy)}$

(C) Solve  $(x^2 - y^2 - z^2)p = 2x(z - yq)$

(D) Solve  $yp = 2yx + \log q$

$$\left\{ \begin{array}{l} e^{an} \\ e^{an} \\ \hline a \end{array} \right.$$

$$\left\{ \begin{array}{l} e^{an} \\ \frac{1}{a} \\ \hline a \end{array} \right.$$

$$\left\{ \begin{array}{l} e^{an} \\ \frac{1}{a} \\ \hline a \end{array} \right.$$

$$\left\{ \begin{array}{l} e^{an} \\ \frac{1}{a} \\ \hline a \end{array} \right.$$

**GOVERNMENT COLLEGE OF ENGINEERING , AMRAVATI**

(10)

**CLASS TEST -2 Winter -2016**

**Course – SHU 301, 303, 304 Engineering Mathematics –III**

**Max, Marks : 15**

Instructions : Attempt any five Question.

(15)

Q1:- Solve  $p(1+q^2) = q(z-b)$

Q2:- Solve  $q = xp + p^2$

Q3:- Solve  $z^2(p^2+q^2) = x^2 + y^2$

Q4:- Solve  $(3y - 2z)p + (z - 3x)q = 2x - y$

Q5:- Solve  $(x^2 + y^2)(p^2 + q^2) = 1$

Q6:- Show that  $\overset{\text{sol} \nu e}{(x+y)(p+q)^2 + (x-y)(p-q)^2 = 1}$