

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 $L^{-1}\left\{ \frac{3s^3 + s^2 + 12s + 2}{(s-3)(s+1)^3} \right\}$

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

CT-2 W-2017 ENGG. MATHS-III (SHU-301-Civil, Mech)

TIME-1 HOUR

Date – 18/09/2017

MARKS-15

Q1. Solve by using separation method $\frac{\partial^2 z}{\partial x^2} + z = 0$, give that when $x = 0$ $z = e^y$ and $\frac{\partial z}{\partial x} = 1$ (3)

Q2. Attempt any four

(12)

a. Solve $(xy^3 - 2x^4)p + (2y^4 - x^3y)q = 9z(x^3 - y^3)$

b. Solve $z^2(p^2x^2 + q^2) = 1$

c. Solve $(1 - y^2)xq + y^2p = 1$

d. Solve $(x^2 + y^2)(p^2 + q^2) = 1$

e. Evaluate $\int_0^\infty te^{-2t} \cos t dt$ by using Laplace

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

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

$$p = yP + Q$$

$$q = xP + a$$

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

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

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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:

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

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

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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 $yp = 2yx + \log q$

$$\begin{cases} e^{an} \\ e^{an} \\ \frac{e^{an}}{a} \end{cases}$$

$$\begin{cases} e^{an} \\ \frac{1}{a} \\ e^{an} \end{cases}$$

$$\begin{cases} e^{an} \\ \frac{1}{a} \\ e^{an} \end{cases}$$

$$\frac{1}{1 + y^2/x^2} \cdot \frac{1}{z^2}$$

$$\sqrt{xy}$$

GOVERNMENT COLLEGE OF ENGINEERING , AMRAVATI

CLASS TEST -2 Winter -2016

(10)

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 $\overset{\text{sol}\circ}{e} (x+y)(p+q)^2 + (x-y)(p-q)^2 = 1$