Government College Of Engineering, Amravati.

(An Autonomous Institute Of Government Of Maharashtra)

CT-1 S-2017 SHU-201 ENGG MATHS-II MARKS-15 TIME-1 HOUR: 4.30 to 5.30 pm Date-15/02/2017

1) Evaluate $\int_0^a \frac{\log(1+ax)}{1+x^2}\,dx$ and Hence evaluate $\int_0^1 \frac{\log(1+x)}{1+x^2}\,dx$.

ATTEMPT ANY FOUR.

2) Trace the curve $y^2(a+x) = x^2(3a-x)$ with full justification.

3) Define Gamma and Beta functions. Evaluate $\int_0^{\frac{\pi}{6}} sin^2 6\theta\, cos^2 3\theta\, d\theta$.

4) Show that $\int_0^1 \frac{x^{m-1}(1-x)^{n-1}}{(1+x)^{m+n}}\,dx = \frac{B(m,n)}{2^m}$

5) Prove that $\int_0^\infty \frac{1}{x^2}\log(1+ax^2)dx = \pi\sqrt{a}$ a>0 .

Deduce that $\int_0^\infty \frac{1}{x^2}\log(1+x^2)dx = \pi$

6) Trace the curve $r^2 = a^2\cos 2\theta$ with full justification.

SHU201 ENGINEERING MATHEMATICS II

CLASS: B.TECH I

Max Marks:15

Solve any five. (15)

1) $\int_0^1 \frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}\,dx = \beta(m,n)$

2) $\int_0^\infty \frac{dx}{\left(e^x+e^{-x}\right)^n} = \frac{1}{4}\,\beta\left(n/2, n/2\right)$

3) Evaluate $\int_0^1 x^{a-1}\left(\log 1/x\right)^{n-1} dx$

4) Verify the rule of DUIS for $\int_0^\infty e^{-ax}\cos bx\ dx$, where a is the parameter.

5) Trace the curve $x\left(x^2+y^2\right) = a\left(x^2-y^2\right)$

6) Trace the curve $r = a(1+\cos\theta)$

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI

CLASS TEST NO.1 Winter-2015

SHU101, ENGINEERING MATHEMATICS-I

M-1

CLASS: B.Tech First Year Date:07/09/2015 Max Marks:15

Que 1: **Attempt any four of the following:** (12)

a) Define rank of matrix and hence find it of $\begin{bmatrix} 2 & -1 & 0 & 5 \\ 0 & 3 & 1 & 4 \end{bmatrix}$. Verify it using normal form.

b) Reduce the following matrix to echelon form and find its rank

$$\begin{bmatrix} 3 & 2 & -4 & 3 & 6 \\ 1 & -2 & 3 & 4 & -3 \\ 2 & -4 & 6 & 8 & -6 \\ 3 & -6 & 9 & 12 & -9 \\ 5 & -2 & 2 & 11 & 0 \end{bmatrix}$$

c) Determine the values of λ for which the following set of equations may possess nontrivial solution. $3x+y-\lambda z=0;\ 4x-2y-3z=0;\ 2\lambda x+4y+\lambda z=0$. For each permissible value of λ, determine the general solution.

d) For the matrix A, find non-singular matrices P and Q such that PAQ is in the normal form and hence find A^{-1}, where $A = \begin{bmatrix} 8 & 4 & -3 \\ 2 & 1 & 1 \\ 1 & 2 & 1 \end{bmatrix}$

e) ... theorem and use it to find the matrix A^{50} if $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \end{bmatrix}$

GOVT.COLLEGE OF ENGINEERING , AMRAVATI

CT-I (Summer 2013) SHU-201 ENGG.MATHS-II Max marks 15 TIME-1 HOUR

Q.1 ATTEMPT ANY FOUR . (12)

1. Trace the curve $r = asin2\theta$ with full justification.
2. Trace the curve $a^2x^2 = y^2(a^2 - y^2))$ with full justification.
3. Prove that $\Gamma(1/2) = \sqrt{\pi}$.
4. Prove that $\int_0^1 \frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}} dx$=B(m,n).
5. Evaluate $\int_0^\infty \frac{e^{-x}}{x}\left(a - \frac{1}{x} + \frac{1}{x}e^{-ax}\right) dx$ by using differentiation under integral sign.

Q 2. Evaluate $\int_0^a \frac{\log(1+ax)}{1+x^2} dx$ by using differentiation under integral sign. (3)