

**ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)**  
**ORGANISATION OF ISLAMIC COOPERATION (OIC)**  
**DEPARTMENT OF MECHANICAL AND PRODUCTION ENGINEERING**

CT-01

COURSE NO. Math-4311

COURSE TITLE: Complex Analysis

TIME: 25 mins

FULL MARKS: 15

Name: \_\_\_\_\_ Id# .....

1.	Find all the fifth roots of unity and exhibit them graphically.
2.	Construct a Riemann surface for the function $z^{1/3}$ .
3.	Determine whether the following function $u$ is harmonic or not. If yes, find the conjugate harmonic function $v$ and express $f(z) = u + iv$ as an analytic function of $z$ . $u(x, y) = x^3 - 3xy^2$

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COURSE NO. Math-4311

COURSE TITLE: Complex Analysis

TIME: 25 mins

FULL MARKS: 15

Name: \_\_\_\_\_ Id# .....

1.	Find all the fifth roots of $1 - i$ and exhibit them graphically.
2.	Construct a Riemann surface for the function $z^{1/4}$ .
3.	Determine whether the following function $u$ is harmonic or not. If yes, find the conjugate harmonic function $v$ and express $f(z) = u + iv$ as an analytic function of $z$ . $u(x, y) = x^2 - y^2 - x + y$

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TIME: 25 mins

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Name: \_\_\_\_\_ Id# .....

1.	Find all the fifth roots of $1 + i$ and exhibit them graphically.
2.	Construct a Riemann surface for the function $z^{1/5}$ .
3.	Determine whether the following function $u$ is harmonic or not. If yes, find the conjugate harmonic function $v$ and express $f(z) = u + iv$ as an analytic function of $z$ . $u(x, y) = 2xy - x - y$

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COURSE NO. Math-4311

COURSE TITLE: Complex Analysis

TIME: 25 mins

FULL MARKS: 15

Name: \_\_\_\_\_ Id# .....

1.	Find all the fifth roots of $-1 + i$ and exhibit them graphically.
2.	Construct a Riemann surface for the function $z^{1/5}$ .
3.	Determine whether the following function $u$ is harmonic or not. If yes, find the conjugate harmonic function $v$ and express $f(z) = u + iv$ as an analytic function of $z$ . $u(x, y) = e^x \sin y$

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1.	Find all the fifth roots of $-1 - i$ and exhibit them graphically.
2.	Construct a Riemann surface for the function $z^{1/4}$ .
3.	Determine whether the following function $u$ is harmonic or not. If yes, find the conjugate harmonic function $v$ and express $f(z) = u + iv$ as an analytic function of $z$ . $u(x, y) = -e^x \cos y$