

Date: 27 July 2023



**Bangladesh Army University of Engineering & Technology (BAUET)**

**Department of Computer Science and Engineering**

**Second Year Fourth Semester (14<sup>th</sup> Batch), Summer-2023**

**Course Code: MATH - 2247**

**Course Title: Complex Variable and Laplace Transformation**

**Class Test-01**

**Full Marks: 15**

**Time: 35 Minutes**

**N.B:** Answer all the questions and the figures shown in the right margin indicate full marks.

1. What do you mean by absolute value of a complex Variable? What is the use of complex number in engineering? Evaluate the absolute value of the complex number defined by  
$$\frac{-7i^{(\text{last one digit of your ID})} + 6i^{3.(\text{last one digit of your ID})}}{8i^{2.(\text{last one digit of your ID})} - 2i}$$
 if possible. 5
2. Applying the De-Moivre's theorem, evaluate the indicated roots of  $z^5 = -32$  and locate them graphically. 6
3. Sketch and analyze the region in z-plane represented by the following relation  $|z+1-i| > |z-1+i|$ . 4



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## Class Test-02

Full Marks: 15

Time: 20 Minutes

2. When a function is said to satisfy Laplace's equation? If possible, prove that  $3+8+4$

$u = -\frac{y}{x^2 - y^2}$  and  $v = \frac{x^2 + y^2}{y}$  both satisfies the Laplace's equation and analyze that  $u + iv$  is analytic or not?

5  
2.5





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**Class Test-03**

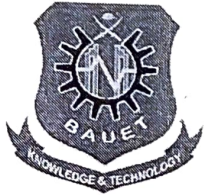
**Full Marks: 15**

**Time: 20 Minutes**

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1. State Cauchy's integral theorem. Evaluate  $\int_C \frac{z+9}{z^2-2z+7} dz$  where  $C$  is the circle  $|z-1|=i$ . 2+5
2. State Cauchy's integral formula. Evaluate  $\int_C \frac{z^2+9z-7}{z^2-9} dz$  where  $C$  is the circle  $|z-2|=3$ . 2+6

Date: 01 October 2023



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**Course Title: Complex Variable and Laplace Transformation**

**Class Test-04 (A)**

**Full Marks: 15**

**Time: 25 Minutes**

1. Explain the Laplace transformation for a function  $G(t)$ . Evaluate the Laplace transformation of  $6t^3 - 4e^{3t} + 3\sin 2t + e^{-2t} \cos 3t + t^2 e^{5t}$ . 2+8
2. Applying the Laplace transform of fourth derivative, verify that  $L\{\sin 23t\} = \frac{23}{s^2 + 529}$ ,  $s > 0$  if possible. 5