**Directorate of Open and Distance Learning**
**Dibrugarh University**
**Dibrugarh 786004**
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## NOTIFICATION

**for**

**BCA 3rd Semester Learners regarding submission of Home Assignments**

This is for information to all Study Centers and Learners under DODL, DU that the student of BCA 3rd Semester (New Course) shall have to submit one Home Assignment in each course (paper). Each assignment carries 30 marks. The questions for the Home Assignments are enclosed herewith. At the time of submitting the assignments, please note the following:

* Write your assignment in A4 size paper neatly, with your own hand- writing on one side of the paper. You may also submit a computer printed copy of your assignments with your signature at the end.
* Stick to the word limit mentioned in the questions.
* Keep a margin of about 5 cm on the left side of the paper.
* You have to submit the assignments directly in the Study Centre wherein you have enrolled yourself.
* The assignments for a course (paper) should be tagged / stapled together to make a booklet, i.e. a separate booklet for each course (paper).
* Keep a duplicate or photo copy of the assignment with you (compulsory).
* The last date of submitting the Assignment is 12th September, 2023 (excluding Sundays)
* The cover page of your booklet should contain the following Label :

**Home Assignment**
**Name of Study Centre**_____
**Roll No.**_____
**Name** _____
**Programme : BCA**
**Class : 3rd Semester**
**Course (Paper) :** _____
**Session :**
**D.U. Registration No. : (If received)** _____**of** ___
**Date of Submission :** _____

Sincerely Yours

Sd/-
( Prof. D.K. Chakraborty )
Director, i/c
DODL, D.U

## ASSIGNMENT 3rd Semester
## Mathematics-III
## BCA -301

**Total marks : 30**

Answer any six question. 5X6=30

1. State and prove the necessary and sufficient condition for f(z) to be analytic.
2. State and prove Cauchy's integral theorem. Is the converse true? If true prove it.
3. What is harmonic function? Prove that f (z)= u+iv is analytic functions in some region of the z-plane, then u, v are harmonic functions.
4. a. Show that the sequence $\{a_n\}$ is bounded monotonic increasing sequence given by $a_n=\frac{1}{1.2}+\frac{1}{2.3}+\frac{1}{3.4}\ldots\ldots+\frac{1}{n.(n+1)}$

   b. Show that the sequence $\{u_n\}$, where $u_n = \sqrt{n+1}-\sqrt{n}$ is a null sequence.
5. Prove that the auxiliary series $\sum\frac{1}{n^p} = \frac{1}{1^p}+\frac{1}{2^p}+\frac{1}{3^p}+\cdots+\frac{1}{n^p}+\cdots$ is convergent if p>1 and divergent if p≤1.
6. Examine the convergence of a. $\int_{-\infty}^{\infty}\frac{xdx}{1+x^2}$ and b. $\int_0^1\frac{dx}{x^{\frac{1}{2}}(1-x)^{\frac{1}{2}}}$
7. Examine the convergence of the series a. $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\cdots$ and b. $\sum\frac{n^{n^2}}{(n+1)^{n^2}}$
8. a. Prove that the Legendre polynomials are orthogonal on the interval [-1, 1].

## ASSIGNMENT
## Theory of Computing
## BCA -302

**Total marks : 30**

Answer any six. 5X6 = 30

1. Distinguish between DFA and NDFA.
2. Construct a D.FA for language

   $L=\{a^n \mid n \geq 1\}$

3. Explain Closure Properties
4. Differentiate between Context free and Context Sensitive grammar.
5. Using Pumping Lemma show that $L=\{a^p/p \text{ is prime}\}$ is not regular.
6. Explain Chomsky's hierarchy.
7. Describe the techniques for Turing machine construction.
8. Describe NP-Hard and NP-Complete problems. Give examples.

## ASSIGNMENT
## Internet and Web Programming Technologies
## BCA -303

**Total marks : 30**

Answer any six. 5X6 = 30

1. What is Internet ? What are the basic features of world wide web ?
2. Discuss some popular web browser.
3. What is client /server network ?
4. What is HTML? How are HTML tags written?
5. Describe the features of a web browser. Explain how browser works.
6. What is ASP? How does it work?
7. What is javascript? How would you write a program in Javascript ?

## ASSIGNMENT
## Computer Graphics
### BCA -304

**Total marks : 30**

Answer any six. 5X6 = 30

1. Explain the color generation techniques in a CRT.
2. What do you understand by computer graphics ? What is the difference between raster and random scan?

3. Explain Cohen-Sutherland line clipping algorithm.
4. Explain midpoint circle drawing algorithm.
5. What are translation, Scaling and Rotation ?
6. What are the basic rules for animation ?
7. Discuss some concepts of virtual reality.

## ASSIGNMENT

## Design and analysis of algorithms

## BCA -305

**Total marks : 30**

Answer any six. 5X6 = 30

1. Explain the various asymptotic notation used in represent the time complexities.
2. Discuss Greedy method.
3. Discuss one algorithm for pattern matching.
4. Explain Kruskal's algorithm to obtain minimum spanning tree with the help of any example.
5. Explain Travelling-Salesman problem.
6. Inorder and Preorder Traversal
7. Write the properties of a binary tree.
8. Explain NP –Completeness.