

HOME ASSIGNMENT (2024 Batch)
BACHELOR OF COMPUTER APPLICATION (BCA)
(THIRD SEMESTER)
CENTRE FOR DISTANCE AND ONLINE EDUCATION
DIBRUGARH UNIVERSITY

(Full Marks 30 for each course)

Course : BCA – 301 (Mathematics-III)

Assignment – 1

Total marks : 5×3=15

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.

Assignment – 2

Total marks : 5×3=15

1. Prove that the auxiliary series $\sum \frac{1}{n^p} = \frac{1}{1^p} + \frac{1}{2^p} + \frac{1}{3^p} + \dots + \frac{1}{n^p} + \dots$ is convergent if $p > 1$ and divergent if $p \leq 1$.
2. Examine the convergence of a. $\int_{-\infty}^{\infty} \frac{x dx}{1+x^2}$ and b. $\int_0^1 \frac{dx}{x^2 (1-x)^2}$
3. Prove that the Legendre polynomials are orthogonal on the interval $[-1, 1]$.

Course : BCA – 302 (Theory of Computing)

Assignment – 1

Total marks : 5×3=15

1. Distinguish between DFA and NDFA.
2. Explain Closure Properties
3. Construct a D.FA for language
 $L = \{a^n \mid n \geq 1\}$

Assignment – 2

Total marks : 5×3=15

1. Explain Chomsky's hierarchy.
2. Using Pumping Lemma show that $L = \{a^p \mid p \text{ is prime}\}$ is not regular.
3. Describe NP-Hard and NP-Complete problems. Give examples.

Course : BCA – 303 (Internet and Web Programming Technologies)

Assignment – 1

Total marks : 5×3=15

1. What is Internet ? What are the basic features of world wide web ?
2. What is cascading Style Sheet? Explain various types of Style sheets with examples.
3. What is client /server network ?

Assignment – 2

Total marks : $5 \times 3 = 15$

1. What is HTML? How are HTML tags written?
2. What is ASP? How does it work?
3. What is Javascript? How would you write a program in Javascript ?

Course : BCA – 304 (Computer Graphics)

Assignment – 1

Total marks : $5 \times 3 = 15$

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.

Assignment – 2

Total marks : $5 \times 3 = 15$

1. What are translation, Scaling and Rotation ?
2. What are the basic rules for animation ?
3. Discuss some concepts of virtual reality.

Course : BCA – 305 (Design and analysis of algorithms)

Assignment – 1

Total marks : $5 \times 3 = 15$

1. Explain the various asymptotic notation used in represent the time complexities.
2. Discuss Greedy method.
3. Explain Kruskal's algorithm to obtain minimum spanning tree with the help of any example.

Assignment – 2

Total marks : $5 \times 3 = 15$

1. Explain Travelling-Salesman problem.
2. Write the properties of a binary tree.
3. Explain NP –Completeness.

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