

**GOVERNMENT DEGREE COLLEGE GANDERBAL**  
**Assignment for BCA 5<sup>th</sup> Semester**

**Regular Batch 2017, Backlog Batch 2016**

**THEOREY OF COMPUTATION**

*dt: 17/06/2020*

**Course Code:BCA-16520CR**

**Marks: 90**

***Attempt any 04 Questions and each question carries equal weight age.***

*Q1. Explain the concept of Finite Automata as a model of computation, discuss its limitations and design a FA to accept those strings having 101 or 110 as substring?*

*Q2. Find the language generated by the following grammars:*

*(i)  $S \rightarrow 0S1$*

*$S \rightarrow 0A1$*

*$A \rightarrow 1A$*

*$A \rightarrow 1.$*

*(ii)  $S \rightarrow 0S1$*

*$S \rightarrow 0A$*

*$S \rightarrow 0$*

*$S \rightarrow 1B$*

*$S \rightarrow 1$*

*$A \rightarrow 0A$*

*$A \rightarrow 0$*

*$B \rightarrow 1B$*

*$B \rightarrow 1.$*

*(iii). Find the regular expression for the following CFG*

*$S \rightarrow aB/bA, A \rightarrow aB/a, B \rightarrow bA/b.$*

*Q3. Explain the concept of Turing Machine as a model of computation and discuss the concept of Decidability?*

*Q4 i) Construct a PDA for the following language  $\{a^n b^{2n} \mid n \geq 1\}$  and compare PDA with FSM?*

*(ii). Explain the basic structure of PDA and what is Pushdown Automata Acceptance.?*

*Q5. Write the regular expressions for the following:*

*(i). The language of strings that begins or ends with 00 or 11.*

*(ii). The language of strings in which number of 0's is even.*

***Instructions:***

1. The assignment is to be submitted through google class room having code **yunj23b**.
2. Last date of assignment submission is **26/06/20**.
3. The assignment must be **handwritten**.
4. Students must write page no., roll no., registration no. on the top right corner of each page.
5. A4 size ruled paper with not more than **10** pages converted into a single PDF file using. **camscanner** will be only accepted.
6. Students are advised to preserve hard copy of Assignment.
7. Do not copy answers from other students.
8. Assignments should be scanned properly for clear visibility.

**Title page of assignment must contain**

Name of the candidate.....  
Semester.....  
Category: Fresh/Backlog.....  
Batch: .....

Roll No.....  
Regd no.....  
Subject.....  
Cell no.....  
E-mail address.....  
Date of Submission.....  
Signature of Candidate.....