# SOUTHWESTERN UNIVERSITY NIGERIA

KM 20, SAGAMU-BENIN EXPRESSWAY, OKUN OWA, IJEBU-ODE, OGUN STATE.

FACULTY OF PURE & APPLIED SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

HND TO BSC CONVERSION PROGRAMME

2018/2019 THIRD SEMESTER EXAMINATION

**COURSE CODE: CMP 420 COURSE TITLE:** Theory of Computation

**INSTRUCTION:** Answer question 1 and any other three (3). **TIME:** 2hrs

1. (a) With the aid of th diagram explain the classification of finite automata

   (b) (i) Desing the structure of a DFH
   (ii) Define its turple
   (iii) Show the tansision function to the DFA

2. (a) With the aid of the diagram explain the over-view of all machines used for computation analysis.

   (b) List all the rules of operation for a turning machine.

3. (a) Design a turing machine that recognises the language L = 00 1 * 0 (Define all parameters used) let the 1 occurs twice.

   (b) Given two regular languages L and $L_2$ find out wether a string w exist in both $L_1$ & $L_2$. Sketch the diagram.

4. (a) Explain the term Decidability and undecidability in theorem of computation

   (b) Explain the following:
   (i) Robinson resolution rule
   (ii) Program verification
   (iii) Recursively enumerable set
   (iv) Halting problems

5. (a) Explain the following:
   (i) Partially decibale and semi-Decidable
   (ii) Recursive language (REC)
   (iii) Recursively enumerable language RE

   (b) (i) Given a turing machine M find out whether a state Q in ever rached when the string w is entered in m.
   (ii) What is the other name of this problem.