Code No.: **10503/20503** **MR11/ MR12**

# MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, JUNE-2018

Subject: **Mathematical Foundations of Computer Science**

Branch: **IT**

**Time: 3 hours** **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15M=75M**

1. a) Prove or disprove the validity of the following arguments.
   i) No mathemeticians are ignorant
   ii) All ignorant people are haughty.
   iii) Hence, some haughty people are not mathematicians.
   b) Prove the following .
   $\forall x [P(x) \wedge Q(x)] \Leftrightarrow [\forall x, (P(x)] \wedge [\wedge x, Q(x)]$

2. a) Write a short notes on Rule P, Rule T, and Rule CP. [3+4+8]
   b) What is a Quantifier? What are various types of quantifier.
   c) Show that SVR is tautologically implied by
   $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$ using Automatic theorem proving.

3. a) Consider F : Z $\rightarrow$ Z define by f (a) = $a^2$ $\forall x \in R$. Is f invetible.
   explanation.
   b) Let the function f & g are defined by f(x) = 2x +1 and g(x) = $x^2$-2 is fog = gof.

4. a) If G = $< Z_6, + >$, H = $< Z_3, + >$ and K = $< Z_2 +)$. Prove that G and H x K is isomorphic.
   b) Define (i) Group (ii) Abelian Group (iii) Semi Group (iv) Sub Group

5. a) In how many ways can 10 people be seated in a row so that a certain pair of them are not next to each other? [5M]
   b) The number of arrangements of letters in the word TALLAHASSEE is? [3M]
   c) State & Prove pigeon hole principle. [7M]

6. Find the solution for the Fibonacci sequence Fl, F2, --------- satisfying the recurrence relation $F_K = F_{K-1} + F_{K-2}$ for all integers $K \geq 2$ with initial Conditions $F_0 = F_1 = 1$. [15M]

7. A graph is said to be self— complementary if it is isomorphic to its complement.
   a) Show a self— complementary graph with four vertices.
   b) Show a self— complementary graph with five vertices.
   c) Is there a self— complementary graph with three vertices? Six vertices.
   d) Show that a self— complementary graph must have either 4K or 4K + 1 vertices.

8. Define the following with an example: [5*3 =15]
   i. Cycle graph. ii. Path graph. iii. Null graph. iv. Sub graph. v. Tree.

MR12

Code No.: 10233/20233

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

## II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Basic Electrical & Electronics Engineering**

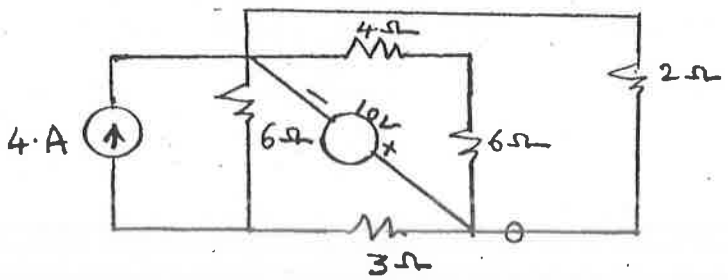
Branch: **Common to CSE & IT**

**Time: 3 hours** **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15M=75M**

1. (a) Explain faraday's law. A metal ring is placed on top of a vertical solenoid. When current is switched on to the solenoid, the ring jumps vertically upward. Explain.
(b) Find self-inductence of a long solenoid per unit length, carrying N turns per unit length, and having radius R. [8+7]

2. (a) State and explain the superposition theorem. [8+7]
(b) Using super position theorem find the current in 2 ohms resistor in the network shown below.




3. (a) Define coefficient of coupling, magneto motive force, reluctance and permeability. [8+7]
(b) Derive the emf equation of transformer and explain principle of operation.

4. (a) Explain the principle of operation of DC generator along with its constructional details. [8+7]
(b) Explain the following (i) slip (ii) rotor frequency and (iii) synchronous speed

5. (a) Define law of junction? Explain about the term cut in voltage associated with p-n junction diode? How do you obtain cut in voltage from forward V – I characteristics?
(b) Briefly discuss about avalanche breakdown and zener breakdown. [8+7]

6. (a) What is a MOSFET? How many types of MOSFET are there? With suitable diagrams explain the working of different MOSFETS. [8+7]
(b) Compare CB; CE and CC Configurations.

7. (a) Compare common collector and common emitter configuration with regards to $R_i$, $R_0$, $A_I$,$A_V$. [8+7]

(b) Draw the circuit diagram of CC amplifier using hybrid parameter and derive expressions for $A_I$, $A_V$, $R_i$, $R_O$.

8. (a) Explain the main difference between an amplifier and an oscillator? What are the main constituents parts of an oscillator. [8+7]
(b) An amplifier has voltage gain with feedback is 100. If the gain without feedback changes by 20% and gain with feedback should not vary more than 2%. Determine the open loop gain A and feedback ratio B.

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## II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Data Structures through C++**

Branch: **Common to CSE & IT**

**Time: 3 hours** **Max. Marks: 75**

Answer any **FIVE** Questions of the following **5x15M=75M**

1. a) Explain different types of parameter passing techniques in C++. [10M]
   b) What is the use of this pointer in C++. [5M]
2. a) What is meant by multiple inheritance? Write a program to illustrate the concept of multiple inheritance. [8M]
   b) What is operator over loading? Write a program to illustrate how to overload the operators in C++. [7M]
3. Write a C++ program to implement linear queue (ADT) with its operations using class templates. [15M]
4. a) Write short notes on separate chaining. [7M]
   b) Compare hashing and skip list. [8M]
5. a. Sort the list of numbers:
   30, 22, 45, 10, 80, 30, 27, 3, 2 using min heap sort method. [10M]
   b. Differentiate between min heap and max heap? [5M]
6. a) Compare AVL Tree and Binary Search Tree. [5M]
   b) Write a program for insertion and deletion in BST. [10M]
7. a) What is a graph in data structures? Explain different types of graphs with suitable example.
   b) Explain linked representation of graph with an example. [7M +8M]
8. a) Differentiate standard tries and compressed tries? [8+7 ]
   b) Explain about Knuth-morris -prat pattern matching algorithms?