Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

II SEMESTER M.TECH. (SOFTWARE ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: SOFTWARE QUALITY ENGINEERING [ICT 5221]

REVISED CREDIT SYSTEM
(20/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data may be suitable assumed.

1A. Discuss various measurements associated with software product to assess the quality during software development life cycle. 5

1B. Explain Gavin's quality factors that improve software product quality. 3

1C. Identify the MISRA C++ rules that is applied to the following code snippets. 2

(i)
```
const int32_t *fn1(const int32_t &x)
{
    return(&x);
}
```

(ii)
```
class B {….};
class D: public virtual B{…};
D d;
B *pB=&d;
D *pD1=dynamic_cast<D*>(pB);
```

2A. Explain the six different methods of analysis phase in UX process? 5

2B. Illustrate the tasks performed in software quality assurance. 3

2C. Describe any four object oriented metrics that is used to effectively analyze the source code during software development. 2

3A. Explain the guidelines for variable declarations, function declarations and program file naming conventions in C++. 5

3B. What is defect density? Calculate the defect density of a 2KLOC web app if the number of defects identified during acceptance testing is 48 before the product is released and the number of defects reported after the web app is released to the customer is 6. 3

3C. Differentiate between the following with respect to software configuration management. 2

i. Software Configuration Item
ii. Baseline

4A. With the help of a neat diagram explain the top down approach of FMEA. Give the steps in calculating relative risk in FMEA. 5

4B. Illustrate the various techniques used to achieve quality software. Also explain the cost associated with building a quality software. 3

4C. Mention good programming practices to be followed for embedded systems in order to improve the code quality. 2

5A. Identify the lines of code which violates MISRA-C rules for the following code snippets. List out the violations and write the correct code as per MISRA-C rules

```
#include<stdio.h>
main()
{
extern int array[];.
int16_t arraya4[2][2] = { 0 };
uint32_t max;
int i,j,k,skip=0,array[10][10];
max >= 100u;
printf("max is greater");
printf("Enter 5 numbers to be summed\n");

  for(i = 0; i<MAX; ++i)
  {
    sumIt();
    skip=i+3;
    array[i]=skip;
  }
 for(i = 0; i<MAX; ++i)
   { printf("%d",array[i]); }
   getchar();
 }
```

```
sumIt()
{
  int sum=0//static int sum = 0;
   int num;
   if(sum===0)
   {
     printf("\nEnter a number: ");
     scanf("%d", &num);
     printf("The current sum is:
              %d",sum);
     sum+=num;
     return sum;
   }
 else
 {
  printf("The current sum NULL);
  return sum;
 }
}
```

5

5B. With the help of a neat diagram show the responsive web design process. Also mention the importance of responsive web design. 3

5C. Illustrate the role of human procedures and automated tools in the change control process for SCM activity. 2