M.Sc. Examination, 2018
Semester-I
Computer Science
Course : MCSC-14
(Software Engineering)

Time : 3 Hours **Full Marks : 40**

Questions are of value as indicated in the margin

Answer Question No.1 and **any four** from the rest.

1. Answer the following questions (any eight) : 1×8=8
   i) Describe the role of Stub and Driver modules in Unit Testing.
   ii) Explain the terms dead and alive mutants..
   iii) For a project development requirements are easily understandable and defined-which software development model is best suited?
   iv) For a project development time and budget is fixed – which model is best suited?
   v) Condition coverage criteria is stronger than statement coverage criteria – Explain with example.
   vi) What is structure chart?
   vii) What do you mean by feasibility study of a Project
   viii) What is the aim of software Engineering?
   ix) What do you understand by software crisis?
2. What is cyclomatic complexity of a Control Flow Graph (CFG)? What are the characteristics of cyclomatic complexity? How does it is related to Software Testing?
   Consider the following software code: Draw the control flow graph and calculate the cyclomatic complexity. Establish how the cyclomatic complexity is related to the number of predicate nodes of the CFG? 1+2+1+1+2+1=8

```
int compute_gcd(int x, int y)
{
while (x!=y)
{
if (x>y) then
x=x-y;
else y=y-x;
}
return x;
}
```

3. Describe various stages of Software Testing. What is the objective of Integration testing? What is the important factor that guides the Integration Plan? Discuss the Bottom-up and Top-down approaches for the integration Testing. What are the advantages and disadvantages for both the approaches? 1+2+1+2+2=8

P.T.O.

4. What is a SRS document? Why it is so important? What are the features of a good SRS document? What are the various attributes of a quality Software? Explain each of these briefly. 1+1+3+1+2=8

5. a) What is software life cycle? Discuss prototype model? What are the advantages of developing a prototype of a system?
   b) Sketch a neat diagram of spiral model of software life cycle. Discuss how the project risk is considered in spiral model. Why it is called a meta model? (1+1+2)+(2+1+1)=8

6. Define various Halstead Software metrics 2+(1+5)=8

   Consider the following programming code :

```
main ( ) {
int a,b,c,avg;
scanf (“%d,%d,%d”;&a, &b, &c);
avg (a+b+c)/3;
printf (“avg=%d”,avg);
}
```

   i) Calculate the number of unique operators and operands of the above program segment.
   ii) Calculate the following Halstead Software metrics for the above programming code:
   Program length, Vocabulary size, Program Volume, Difficulty Level, Effort.

7. What is modularity? List the important properties of modular system. Define module coupling and module cohesion. Explain different types of coupling and cohesion. 2+1+2.5+2.5=8

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