Indian Institute of Information Technology Ranchi

Department of CSE

B. Tech Mid Semester Examination – Spring Semester 2022-23

Semester:6th **Branch: CSE**

Course Code: CS-3004 **Course Name: SOFTWARE ENGINEERING**

QUESTION PAPER

1: Answer the Following Questions. **[2x5=10]**

a) What do you mean by Software Crisis?
b) What you understand by Exploratory Software Development? Explain with Diagram.
c) Which Principles are deployed by Software Engineering Techniques to Overcome Human Cognitive Limitations?
d) Explain Structured Programming with Examples.
e) Explain Phase Containment of Errors.

2: (a) Explain Incremental Model of Software Development with Model Diagram. Which Type of Software is Suitable for Incremental Development? **[5]**

(b) How Incremental Model of Software Development is different from evolutionary Software Development **[5]**

3: Select the Correct Option, Explain with reason. **[(1+1) x 5=10]**

(a) The desirable characteristics that every good software design needs are:
a) □ Correctness
b) □ Understandability
c) □ Efficiency
d) □ Maintainability
e) □ All of the above

(b) A module is said to have logical cohesion, if
a) □ it performs a set of tasks that relate to each other very loosely.
b) □ all the functions of the module are executed within the same time span.
c) □ all elements of the module perform similar operations, e.g. error handling, data input, data output
d) □ None of the above.

(c) Among development phases of software life cycle, which phase typically consumes the maximum effort?
a) □ Requirements analysis and specification
b) □ Design
c) □ Coding
d) □ Testing

(d) Which of the following is not an essential program constructs?
a) □ sequence
b) □ selection
c) □ jump
d) □ iteration

(e) An SRS document normally does not contains
a) □ Functional requirements of the system
b) □ Module structure
c) □ □ Non-functional requirements of the system
d) □ Constraints on the system

4: Answer True or False, Explain with Reasons **[(1+1) x 5=10]**

(a) Functional requirements address maintainability, portability, and usability issues. F
(b) The primary characteristic of a good design is low cohesion and high coupling. F
(c) In the function-oriented design approach, the system state is decentralized and not shared among different functions. F

(d) Evolutionary life cycle model is ideally suited for development of very small software products typically requiring a few months of development effort. F

(e) All software engineering principles are backed by either scientific basis or theoretical proof. T

5: Find the Difference **[2 x 5=10]**

(a) JOB Vs Project

(b) Software Product Vs Software Services

(c) Software Verification Vs Software Validation

(d) RAD vs Prototyping

(e) Control Flow Graph Vs Data Flow Graph

6: **DRAW CFG and Find CC**

[2x5=10]

(a)

```
while (i<n-1) do
j = i + 1;
while (j<n) do
if A[i]<A[j] then
swap(A[i], A[j]);
end do;
i=i+1;
end do;
```

(b)

```
{
 int i, j, k;
  for (i=0 ; i<=N ; i++)
  p[i] = 1;
  for (i=2 ; i<=N ; i++)
  {
    k = p[i]; j=1;
    while (a[p[j-1]] > a[k] {
       p[j] = p[j-1];
       j--;
  }
```

(c)

```
begin int x, y, power;
    float z;
    input(x, y);
    if(y<0)
    power = -y;
    else power = y;
    z=1;
    while(power!=0)
    {  z=z*x;
       power=power-1;
    } if(y<0) end
```

(d)

```
int binsearch(int x, int v[], int n)
{
  1 | int low, high, mid;
    | low = 0;
    | high = n - 1;
      while (low <= high) | 2
      {
         3 | mid = (low + high)/2;
           | if (x < v[mid])
                high = mid - 1;  | 4
         5 | else if (x > v[mid])
                low = mid + 1;   | 6
         7 | else return mid;
      }
      return -1; | 8
} | 9
```

(e)

```
for all nodes, n, in the CFG
    DF(n) ← ∅

for all nodes, n, in the CFG
    if n has multiple predecessors then
        for each predecessor p of n
            runner ← p
            while runner ≠ IDOM(n)
                DF(runner) ← DF(runner) ∪ {n}
                runner ← IDOM(runner)
```