NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA-769008
MID-SEMESTER EXAMINATION, 2019
SESSION: 2019 – 2020 (Autumn)
M.Tech. 1st / Dual Degree 9th Semester

Subject code: CS 6413 / CS 614 Subject Name: SPPQM Dept. Code: CS
No. of pages: 2 Full Marks: 60 Duration: 2 *Hours*

Figures at the right hand margin indicate marks.
All parts of a question should be answered at one place.
Answer all the questions

Q.No.	Particulars	Marks
1.		2x10=20
(a)	What do you mean by project Charter? Write down any two of its contents.	
(b)	Give any two differences between traditional and modern Project practices.	
(c)	What is the difference between tangible cost and intangible cost? Give at least one example for each of the above costs.	
(d)	What do you mean by IRR? What is its disadvantage.	
(e)	Mention any two important needs for agile methods.	
(f)	What do you understand by sliding window planning?	
(g)	In context with COCOMO II, why Post architecture model is used? Write down the formula for estimating effort using Post architecture model.	
(h)	For a small project the duration is estimated to be 18 months. The project cost is initially negotiated to be Rs 100,000. It is required that the product to be developed and delivered in 9 months time. What is the new cost that needs to be negotiated?	
(i)	Why product breakdown structure (PBS) is used? How does it differ from work breakdown structure (WBS).	
(j)	Give an example of an activity network showing lagged activities.	
2.		5x4=20
(a)	Identify the important characteristics of software development projects which make these harder to manage compared to other types of projects, say for example, a building construction project.	
(b)	Assume that the size of an Embedded type software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers be Rs. 15,000/- per month. Determine the Effort, Development time and Cost required to develop the product.	
(c)	Consider a project to develop a full screen editor. The major components identified are (1) Screen edit, (2) Command Language Interpreter, (3) File input and output, (4) Cursor movement and (5) Screen movement. The sizes for these are estimated to be 4K, 2K, 1K, 2K and 3K delivered source code lines, respectively. Use Intermediate COCOMO to estimate the final effort and total development time. Assume that the values of significant cost drivers are as follows (1) high software reliability = 1.15 (2) high product complexity = 1.15 (3) high analyst capability = 0.86 (4) low programmers experience = 1.13 (5) All other drivers are nominal =1.00.	

P.T.O.

(d) Calculate the estimated length, program volume, program level, programming effort, and programmer's time using Halstead technique for the following C function? You may assume the value of speed of mental discrimination is 18.

```
func( )
{
   if (k < 2)
   {
        if (k > 3)
             x = x*k;
   }
}
```

3. 10+5+5=20

(a) Consider the activities of a software project shown in below table. Draw the network diagram, find out the critical activities and critical path, and calculate the project completion time using CPM. Show all the intermediate steps and calculations, in your answer.

Activity	Duration (days)	Predecessor
A	23	-
B	8	-
C	20	-
D	16	A
E	24	A
F	18	B, D
G	19	C
H	4	B, G
I	10	F, G

(b) Develop the Gantt chart representation of the activities in the above project. You may assume that the project will start from 1st October 2019.

(c) Nice Ltd. wants to expand its business and so it is willing to invest Rs. 10,00,000. The investment is said to bring cash inflow of Rs. 1,00,000 in first year, Rs. 2,50,000 in the second year, Rs. 3,50,000 in third year, Rs. 2,65,000 in fourth year and Rs. 4,15,000 in fifth year. Assuming the discount rate to be 10%, calculate the Net profit, Payback Period, Return on Investment (ROI) and NPV.