National Institute of Technology Rourkela

Computer Science and Engineering

Software Engineering (CS3004), Mid-Term Exam

Date: February 22, 2022

Time: 60 Minutes **Max. Marks: 25**

Instruction: ***1. In case of any doubt, write your assumptions, write it clearly and continue.***
2. There are 2 questions printed on both side of the paper. Attempt all the questions.
3. Do not use mobile for calculation.

Case Study: A super market needs to develop software that would help it to automate a scheme that it plans to introduce to encourage regular customers. In this scheme, a customer would have first register by supplying his/her residence address, telephone number, and the driving license number. Each customer who registers for this scheme is assigned a unique customer number (CN) by the computer. A customer can present his CN to the check out staff when he makes any purchase. In this case, the value of his purchase is credited against his CN. At the end of each year, the supermarket intends to award surprise gifts to 10 customers who make the highest total purchase over the year. Also, it intends to award a 22 caret gold coin to every customer whose purchase exceeded Rs. 10,000. The entries against the CN are reset on the last day of every year after the prize winners' lists are generated.

Q1. For the given case study,

(A) Describe the functional and non-functional requirements [4]
(B) Draw the context diagram and Level-1 DFD. [3]
(C) Draw the level-2 DFD for at least two bubbles obtained from Level-1 DFD. [3]
(D) Develop the detailed data dictionary for the DFD model created for the same problem. [3]

Q2. A project consists of seven activities. The immediate predecessor of each activity and the estimated durations (optimistic, most likely and pessimistic) is also provided in the table below:

Activity	**Estimated Duration (weeks)**			**Predecessor**
	Optimistic (o)	**Most Likely (m)**	**Pessimistic (b)**	
A	3	6	9	-
B	2	5	8	-
C	2	4	6	A
D	2	3	10	B
E	1	3	11	B
F	4	6	8	C, D
G	1	5	15	E

(A) Draw the Activity network representation of the tasks. [2]
(B) Develop the Gantt chart representations for the project considering the expected time as duration. [2]
(C) Determine ES, EF for every task and calculate expected project duration using PERT. [4]
(D) Find the z-score of completing the project by 18 weeks. [4]

End of Paper