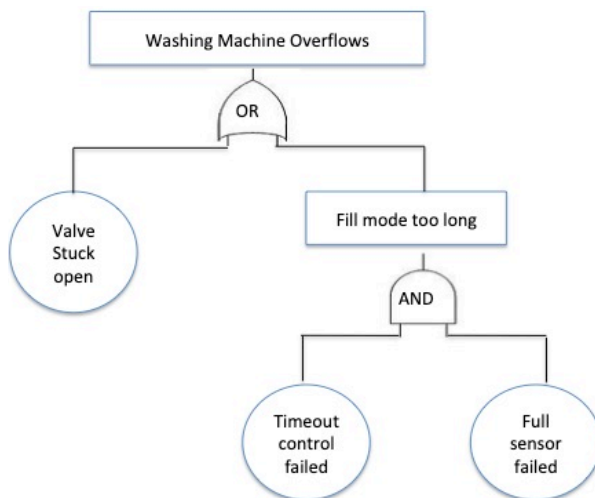


**ENSF 613 - Software Requirements Analysis and Process Management**  
**Fall 2019 – Midterm Exam Solutions**

**Please select the best answer.**

1. “Time boxing” in development process models like RAD means, if developers cannot implement the expected requirement of a system or a portion of system within an allocated time period, then:
  - a. **Some of the low priority requirements will be removed.**
  - b. The allocated time will be extended.
  - c. More developers will be added
  - d. None of the above
2. ROI, the return of investment is a:
  - a. Ratio between net profit and cost of investment
  - b. Ratio of net cash flows and total cost of investment
  - c. **Ratio between present value of net profit and cost of investment**
3. Assuming that P is the probability of a risk in a project, and C is its dollar value of the loss . A quantitative measure for this risk can be calculated by Risk Exposure Index as follows:
  - a.  $(P + C) * 2$
  - b.  $P / C$
  - c.  $P * C * 2$
  - d.  **$C * P$**
  - e. None of the above
4. “Test First” concept is the driving force for which one of the following development processes.
  - a. **Test Driven Development**
  - b. Spiral development process
  - c. Scrum development process
  - d. All of the above
  - e. None of the above
5. “Risk Analysis” is a particular focus of:
  - a. Agile software development process
  - b. V-shape software development process
  - c. Scrum software development process
  - d. **Spiral software development process**
  - e. None of the above
6. Consider the following fault-tree analysis diagram that shows the combination of events which can result in a washing machine overflow:



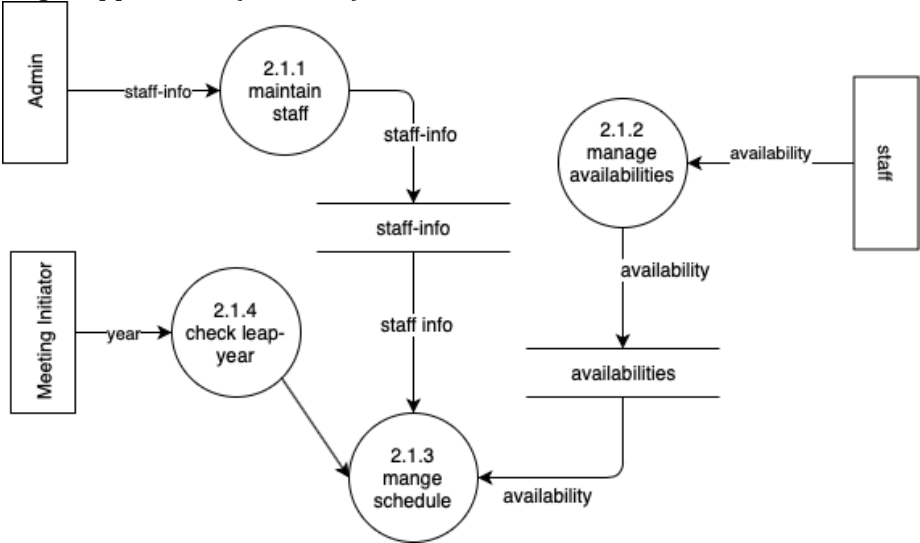
What is the risk of a washing machine overflows if all event are independent and their probability are as follow:

Probability of value stuck open = 0.01  
Probability of timeout control failure = 0.05  
Probability of full-sensor failure = 0.07

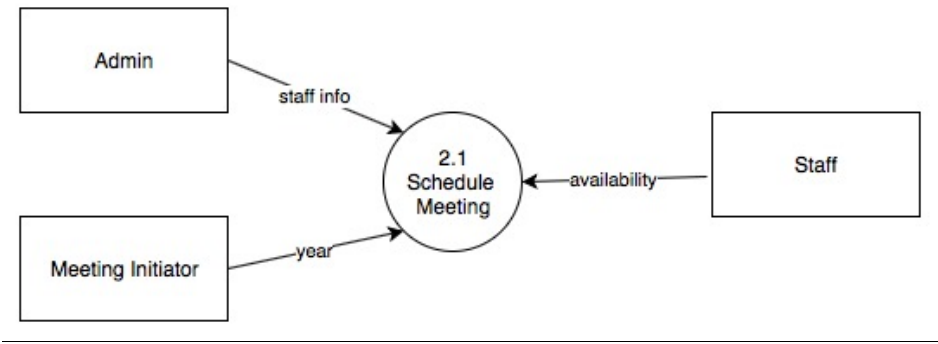
- a. 0.0035
- b. **0.0135**
- c. 0.01
- d. None of the above

**PART TWO – Short Answer Questions:**

**Question 1:** The following diagram shows the decomposition of a process called “Manage Meeting”, as part of a larger application **(5 Marks)**



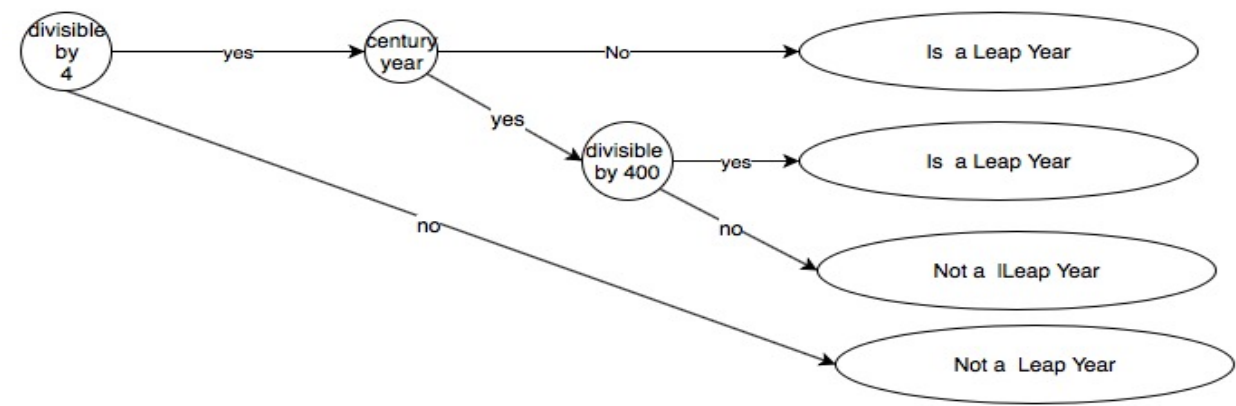
Based on given information, in the following space draw the systems DFD diagram at the higher level:



**Question 2:** Consider the following Structured English that show the details of the process 2.1.4 (check leap-year) from diagram in question 1:

```
IF year IS DIVISIBLE BY 4
    IF year IS NOT A CENTURAY-YEAR // means not divisible by 100
        year IS A LEAP-YEAR
    ELSE
        IF year IS DIVISIBLE BY 400
            year IS A LEAP-YEAR
        ELSE
            year IS NOT A LEAP-YEAR
        ENDIF
    ENDIF
ELSE
    year IS NOT A LEAP-YEAR
ENDIF
```

In the following space, draw a “Decision Tree” that expresses the same logic **(6 Marks)**:

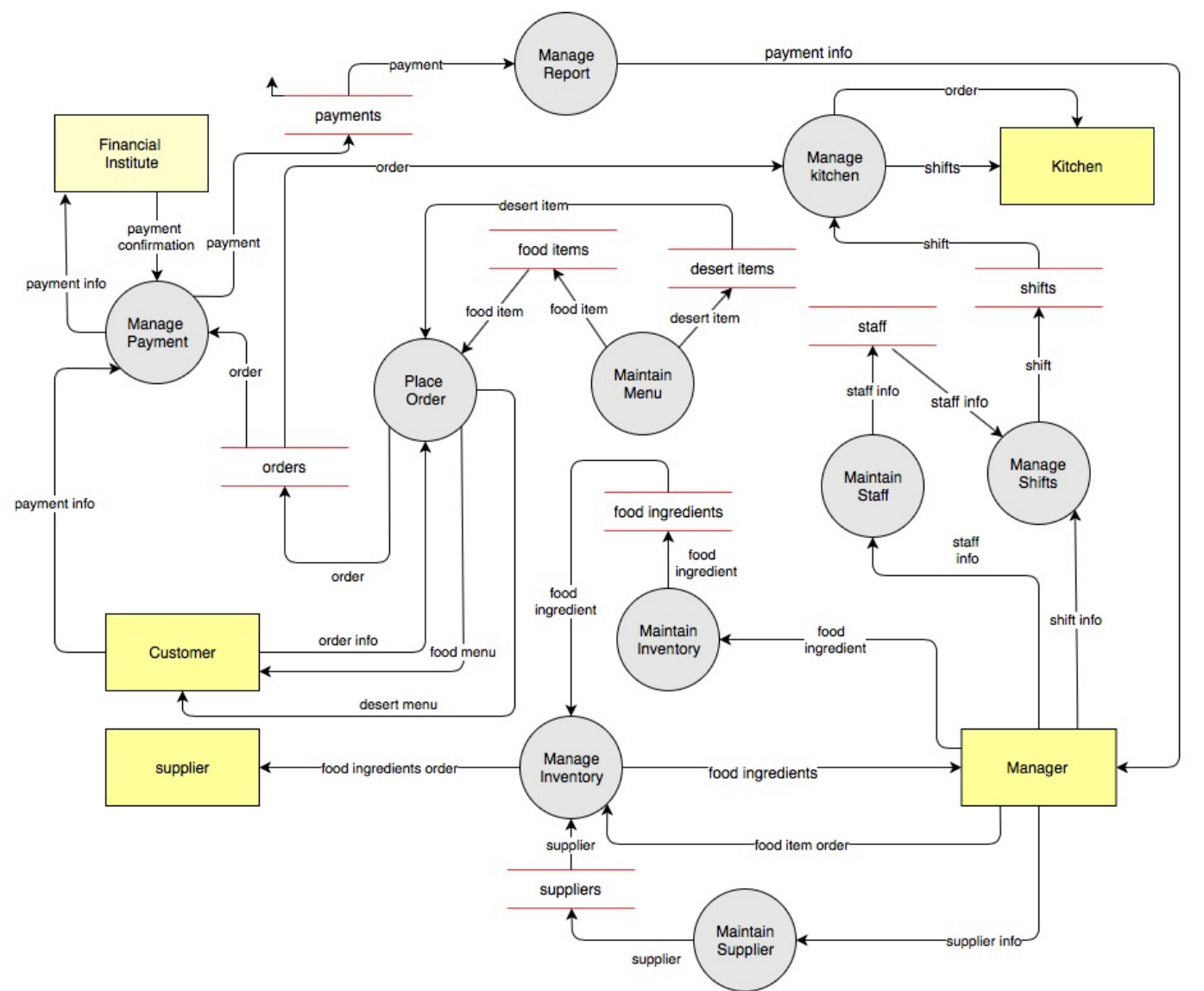


**PART III – SYSTEM REQUIRMENTS ANALYSIS**

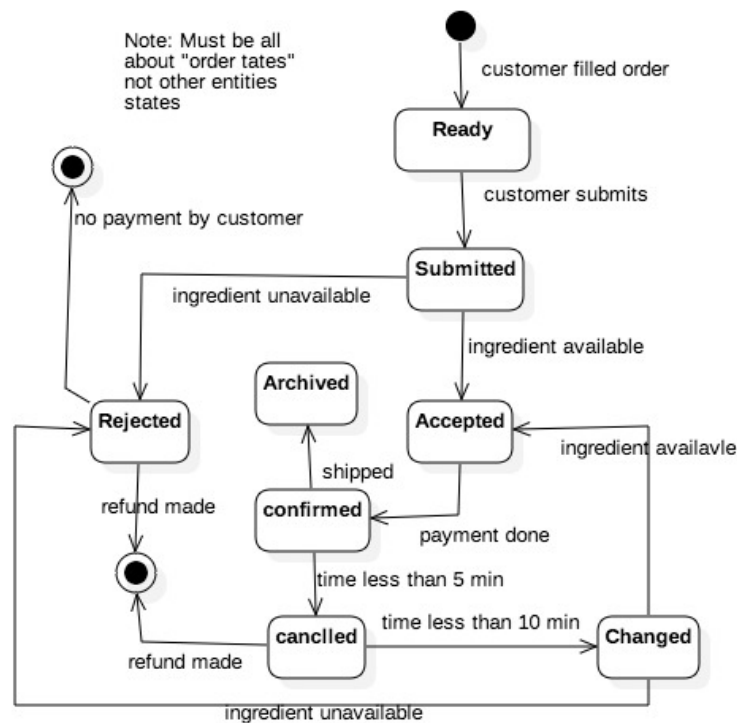
Assume you have been assigned as a system analyst, to develop a requirements analysis document for a small Pizza Delivery business. After a set of interviews conducted by one of the developers here is a the major features that are needed:

1. Customers should be able to: **a)** Place orders online. **b)** Change their orders no later than 10 minutes after placing their orders. **c)** Cancel their orders maximum up to 5 minutes after placing order. **d)** Make payment online. **e)** Receive a receipt online. **f)** Receive a refund, if their order is not delivered within an hour.
2. The manger(s) should be able to:
  - maintain the store's food and desert menus (add/remove/update food and deserts)
  - print a payment-transaction report for any period (a start date to an end date).
  - maintain staff information that normally work two shifts (9 AM to 5 PM) and (5:00 to 1:00 AM)
  - maintain inventory of food ingredients (vegetable, meet, bread, etc.)
  - maintain information about suppliers of food items (name, address, email, phone number)
3. send email to the supplier to place order for food item (vegetable, meet, ...)
4. The kitchen should be informed of a new order received from a customer.

**Question I:** Draw the Data Flow Diagram of the system at the highest level (the level below the context diagram). Please make sure to include terminators in this diagram



Question II: Draw a state transition diagram that shows the state of an **order**. Please consider all possible states.



Question IV: Draw a simple ER diagram for the system that only shows entities and the relationships between them (including cardinalities):

