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FIFTH SEMESTER B.Tech (CCE) DEGREE END SEMESTER EXAMINATION DECEMBER – 2015
SUBJECT: SOFTWARE DESIGN TECHNOLOGY – ICT 359
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **04/12/2015** **MAX. MARKS: 50**

Instructions to candidates

- Answer any **FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.

1A. What is an agile process? Explain Extreme programming agile process model along with its advantages and disadvantages.

1B. With suitable examples explain the following.

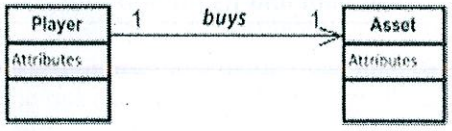
i. Dependency relation in class diagram

ii. Include and extends relation in use case diagram

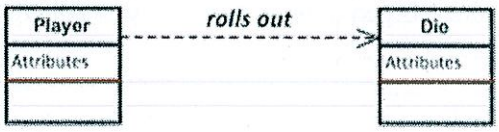
iii. Role name in a class diagram.

1C Write the equivalent java code for realization of the following class diagram.

i.



ii.



[5+3+2]

2A. A crisis management scenario is usually triggered by a crisis report from a witness at the scene. A coordinator, who is in charge of organizing all required resources and tasks, initiates the crisis management process. The coordinator has access to the camera surveillance system. The surveillance system is an external system used to monitor traffic on highways or other busy routes. The cameras are installed only in specific locations. If a crisis occurs in locations under surveillance, the crisis management system can request video feed that allows the coordinator to verify the witness information. A super observer, an expert in the field (depending on the kind of crisis), is assigned to the scene to observe the emergency situation and identify the tasks necessary to cope with the situation. The tasks are crisis missions defined by the observer. The coordinator is then required to process the missions by allocating suitable resources to each task. Depending on the type of crisis, human resources could include firemen, doctors, nurses, policemen, and technicians, and hardware resources could include transportation systems, computing resources, communication means (such as PDAs or mobile phones), or other necessities like food or clothes. Animals, for instance police dogs, are also used as resources in some situations. The human and animal resources act as first-aid workers. Human first-aid worker is assigned a specific task which needs to be executed to recover from the abnormal situation. The workers are expected to report on the success or failure in carrying out the missions. The completion of all missions would allow the crisis to be concluded.

i. Draw a use case diagram for the above problem statement.

ii. Write the use case specification for any one use cases of the use case diagram drawn in Q2A(i).

Why it is difficult in requirement elicitation to gain a clear understanding of what the customer wants? Explain.

2C. Explain the sprints and backlog activities of the software process patterns employed in SCRUM. [5+3+2]

3A. Identify the classes for the problem statement given in Q.2A and draw the detailed class diagram for the same. (Including cardinality, association name etc.)

3B. Mention the difference between the following concepts with respect to class diagram.

i. Cardinality and modality ii. Aggregation and composition

3C. Identify which of the following statements are functional requirements and which are non-functional Requirements.

i. The ticket distributor must enable a traveller to buy weekly passes.

ii. The ticket distributor must be easy to use.

4A. Explain the following : [5+3+2]

i. Cause Elimination debugging approach

ii. Proactive and Reactive risk strategies

iii. W^5HH principle

4B. The table below depicts a system development project with the breakdown of tasks. Draw the activity network representation for the project. Identify the critical path and its duration for the given project and slack time of all the tasks.

Task	Duration in days	Dependencies
A	6	--
B	9	A
C	5	A
D	11	A
E	8	B
F	6	C,D,E

4C. Which testing technique you follow for the following testing? Explain.

i. GUI correctness ii. Internal data structures validity

5A Write the taxonomy of the software architectural styles and also, explain any one the architectural style. [5+3+2]

5B. Draw state transition diagram to model the behaviour of the watch described below:
A simple digital watch has a display and two buttons to set it, the A button and the B button. The watch has two modes of operation, display time and set time. In the display time mode, the watch displays hours and minutes, separated by a flashing colon. The set time mode has two sub-modes, set hours and set minutes. The A button selects modes. Each time it is pressed, the mode advances in the sequence: display, set hours, set minutes, display, etc. Within the sub-modes, the B button advances the hours or minutes once each time it is pressed. Buttons must be released before they can generate another event.

5C. In a system designed to work out the tax to be paid: An employee has £4000 of salary tax free. The next £1500 is taxed at 10%. The next £28000 after that is taxed at 22%. Any further amount is taxed at 40%. Design a relevant set of test cases using boundary testing technique.

6A. Consider the following pseudocode: [5+3+2]

```
int functionZ(int y)
{  int x = 0;
while (x <= (y * y)) {
```

```
if ((x % 11 == 0)  && (x % y == 0)) {
    printf("%d", x);
    x++;  } // End if
else if ((x % 7 == 0) || (x % y == 1)) {
    printf("%d", y);
     x = x + 2;  } // End else
     printf("\n");
 } // End while
 printf("End of list\n");
return 0;
} // End functionZ
```

i. Draw the CFG for the pseudocode.
ii. Find the cyclomatic complexity for the CFG.
iii. Find the independent execution paths and test cases for the same.

6B. Develop an activity diagram based on the following narrative.

The purpose of the Open Access Insurance System is to provide automotive insurance to car owners. Initially, prospective customers fill out an insurance application, which provides information about the customer and his or her vehicles. This information is sent to an agent, who sends it to various insurance companies to get quotes for insurance. When the responses return, the agent then determines the best policy for the type and level of coverage desired and gives the customer a copy of the insurance policy proposal and quote.

6C. Which among the following decisions can be made during requirements phase?

i. The ticket distributor is composed of a user interface subsystem, a subsystem for computing tariff, and a network subsystem managing communication with the central computer
ii. The ticket distributor provides the traveller with an on-line help
iii. The ticket distributor system response time expected is not more than 5ms

[5+3+2]

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