Total No. of Questions : 11] [Total No. of Pages : 4

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B.E. (IT)

SOFTWARE TESTING AND QUALITY ASSURANCE

(2003 Course) (414444) Sem I

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer question 1 or 2, 3 or 4 and 5 or 6 from Section I and question 7 or 8, 9 or 10 from Section II.***
2) ***Question 11 is compulsory.***
3) ***Answers to the two sections should be written in separate books.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Figures to the right indicate full marks.***
6) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Explain the difference between the following : **[10]**

i) Verification and validation.
ii) Load and stress testing.
iii) Test plan and test strategy.
iv) Defect severity and defect priority.
v) Integration testing and incremental integration testing.

b) What defect types are most likely to be detected during integration tests of a software system? Describe your choices in terms of both the nature of integration test and the nature of the defect types you select. **[8]**

OR

Q2) a) An air traffic control system can have one or many users. It interfaces with many hardware devices such as displays, radar detectors and communication devices. This system can occur in a variety of configurations. Describe how you would carry out configuration test on this system. **[10]**

b) Product requirements are incomplete and ambiguous. What are the other sources of information you will use to understand requirements better?**[8]**

Q3) a) Considering online and / or catalog shopping. Develop a use case to describe an user purchasing a television set with a credit card from an online vendor using web-based software, With the aid of your use case, design a set of tests you could use during system test to evaluate the software. **[6]**

P.T.O.

b) GOLFSCORE is a program which calculates the scores of the participants in a golf tournament which is based on the following assumptions and scoring rules : **[10]**

Assumptions :

i) The number of courses played can be from 1 to 8.

ii) The number of participating golfers can be from 2 to 400.

iii) Each golfer plays each course once.

iv) A golfer's tournament score is the sum of his/her scores on each course.

v) Each golf course has 18 holes, and par for each hole is 3, 4 or 5.

Scoring rules for each hole :

Strokes	Score
Over par	0
Par	1
1 under par	2
2 under par	4
>2 under par	6

Input

Input to GOLFSCORE is a formatted text file containing the following records in sequence :

i) Course records. One record for each golf course. Each record contains the name of the course and the par for each of its 18 holes.
Column 1 : Blank
Columns 2 - 19 : Course Name
Columns 21 - 38 : Par for holes 1 - 18 (par is an integer 3, 4, or 5)

ii) Delimiter record. Denotes the end of the course records.
Column 1 : Non-blank
Columns 2 - 60 : Blank

iii) Golfer records. One record per golfer per course (in any order). Each record contains the name of the golfer, the name of the course, and the actual number of strokes taken for each of the 18 holes.
Column 1 : Blank
Columns 2 - 19 : Course name
Columns 22 - 39 : Golfer name
Columns 41 - 58 : Number of strokes taken for holes 1 - 18 (per hole, number of strokes in a single, non-zero digit).

iv) Delimiter record. Denotes the end of the golfer records.
Column 1 : Non-blank
Columns 2 - 60 : Blank

Output

GOLFSCORE produces the following output reports, showing :

i) The names of the golfers, their scores for each course, their total scores, and their final rank in the tournament, sorted in descending order of total score.

ii) The same as report (1), but sorted alphabetically by golfer name.

iii) Per course, the same as report (1), but sorted in descending order of score on that course.

Each report contains one output record per golfer.

Now, complete the following worksheet with the above data :

External input condition	Valid equivalence classes	Invalid equivalence classes

OR

Q4) a) Answer the following in short : **[8]**

i) You see a failure/defect in terms of system behaviour once, but don't know how to get it again. This is called a non reproducible bug. Will you report it? Why?

ii) You're reporting a bug which is similar to another bug reported already. Will you cross reference them or report a new bug? Give reasons in each case.

iii) A bug report requires you to run multiple tests to check whether the bug is fixed. In this case, report them as different bugs. True or False?

iv) What is a bug triage meeting?

b) Based on the following procedure, identify two test conditions for each of the following : **[8]**

i) Statement coverage.

ii) Decision coverage.

iii) Condition coverage.

iv) Multiple condition coverage.

```
Procedure liability (age, gender, married, premium)
begin
  premium :=500;
    if ((age<25) and (gender = male) and (not married)) then
  premium := premium + 1500;
    else if ((married or (gender = female)) then
        Premium := premium - 200;
    if((age>45) and (age<65)) then
        Premium := premium - 100;)
  end;
```

Q5) a) Explain in short the following metrics used in software testing : **[8]**

i) Test coverage. ii) Test Execution status.

iii) Defect density. iv) Defect leakage.

b) Explain GQM technique in detail. Draw a GQM tree for the quality goal of achieving better software usability. **[8]**

OR

Q6) a) Explain the differences between external and internal attributes with examples from different entities like project, product and resources. **[8]**

b) How do you calculate defect density and defect removal rate? Discuss ways to improve these rates for a better quality product. **[8]**

SECTION - II

Q7) a) Explain the objectives and elements of software reviews and inspections. **[8]**

b) Enlist the key items you will include in a requirements verification checklist. **[8]**

OR

Q8) a) Explain any four Ishikawa's basic quality tools. **[8]**

b) Explain the following software reliability quality attributes in short : **[8]**

i) Usability. ii) Portability.

iii) Maintainability. iv) Interoperability.

Q9) a) Explain the goals and activities performed in the following KPA's **[8]**

i) Software project tracking and oversight.

ii) Organization process definition.

b) List all the requirements of ISO 9000 and ISO 9001. **[8]**

OR

*Q10)*a) What is six sigma? Explain the terms DMAIC and DMADV with reference to six sigma. **[8]**

b) How is defect prevention and process change management brought into practice? **[8]**

*Q11)*a) What do you mean by network testing? Explain different types of network security testing? **[6]**

b) Write short notes on any two of the following : **[12]**

i) Web-based software security testing (2 tier / 3 tier applications).

ii) Testing of OOD Models.

iii) Website testing checklist.