**Roll No.**

**ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)**

**B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2022**

INFORMATION TECHNOLOGY

Fifth Semester

**IT5015 & SOFTWARE TESTING**

(Regulation 2019)

Time: 3hrs Max.Marks: 100

|  |  |
| --- | --- |
| CO 1 | To introduce the basics and necessity of software testing. |
| CO 2 | To provide various testing techniques along with concepts of software bugs and its impact. |
| CO 3 | To develop and validate a test plan. |
| CO 4 | To build a testing team required. |
| CO 5 | To understand the need for and challenges in test automation and to develop testing scripts. |

**BL – Bloom’s Taxonomy Levels**

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

**PART- A (10 x 2 = 20 Marks)**

(Answer all Questions)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No** | **Questions** | **Marks** | **CO** | **BL** |
| 1 | List out the levels of testing maturity model. | **2** | 1 | L1-1 |
| 2 | Why test cases should be developed for both valid and invalid inputs? | **2** | 1 | L2-3 |
| 3 | Find cyclomatic complexity and number of region’s for the graph ‘G’ | **2** | 2 | L3-1 |
| 4 | Design test summary report to perform unit testing on mobile banking application for money transferring from one account to another account. | **2** | 2 | L5-3 |
| 5 | Assume that 47 defects that are ranges from critical to cosmetic errors are seeded on a product. Suppose when the last team completes testing, it has found 24 seeded defects and 13 original defects. What is the total No. of defects that may be latent with the product? | **2** | 3 | L5-3 |
| 6 | Briefly comment about the following software tools:  i) Watir.  ii) Fitness tool. | **2** | 3 | L1-1 |
| 7 | List the various skills needed by the test specialist. | **2** | 4 | L2-2 |
| 8 | What is test log? | **2** | 4 | L4-1 |
| 9 | Distinguish between milestone and deliverable. | **2** | 5 | L4-3 |
| 10 | What are the challenges in test automation? | **2** | 5 | L4-4 |

**PART- B (5 x 13 = 65 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No** | **Questions** | **Marks** | **CO** | **BL** |
| 11 (a) (i) | Explain in detail about origin of defects with suitable diagram. | **7** | 1,2 | L2-2 |
| (ii) | Explain testing maturity model and the test related activities that should be done for V-model architecture. | **6** | 1,2 | L2-2 |
| **OR** | | | | |
| 11 (b) (i) | Outline the goal of software testing and write a note on software testing principles. | **7** | 1,2 | L2-2 |
| (ii) | Analyze tester’s role in software development organization. | **6** | 1,2 | L2-2 |
| 12 (a) (i) | Explain in detail about equivalence class partitioning analysis and boundary value analysis. | **7** | 2 | L3-2 |
| (ii) | Let us consider the E-mail login page: 1) Write down any six different test cases that includes functional  and security test cases.( valid/invalid)  2) Generate the test case template and mention the status of  bugs.  3) Find the defects, if any defects identified then fix the defects  and also generates the bugs report for the same test cases. | **6** | 3 | L5-3 |
| **OR** | | | | |
| 12 (b) (i) | Define white box testing. Diffentiate static and structural testing. | **7** | 2 | L3-2 |
| (ii) | Consider an application that is required to validate a string according to the following simple rules. Draw state transition diagram and table for the scenarios.  1) A string must start with “$$” sign.  2) The “$$” sign can be followed by exactly three consecutive A’s.  3) The alphabets can be optionally followed by an underscore  symbol.  4) If there is an underscore symbol, then there should be one digits  after the underscore symbol.  5) Any string- whether or not it has an underscore symbol, should  be terminated by a blank. | **6** | 3 | L5-3 |
| 13 (a) (i) | Explain in detail about use case scenario testing and draw the use case for withdrawing cash from bank. | **6** | 2 | L3-2 |
| (ii) | Apply priority to the following test case scenarios using regression testing.   1. A test cases for a network product that tests basic flow control   and error control.   1. A test case for a database software that tests all the options of a join query. 2. A test case for a file system that checks allocation of space that is not contiguous 3. A test case that tests the startup of OS with normal parameters. 4. A test case corresponding to a stable feature that has not uncovered any major defects. | **7** | 3 | L4-3 |
| **OR** | | | | |
| 13 (b) (i) | Explain in detail about the various types of Integration testing. Give example. | **6** | 2 | L3-2 |
| (ii) | Consider the following code, find the statement, path and branch coverage.  while (x<100){  if(a[x]%2==0)  {  parity = 0;  }  else {  Parity =1;  }  switch(parity)  {  case 0 :  println(“a[“+i+”] is even”);  break;  case 1 :  println(“a[“+i+”] is odd”);  break;  default :  println( “ Unexpected error”);  break;  }  x++;  }  P=true | **7** | 3 | L4-3 |
| 14 (a) | Explain the concepts of test planning in detail. Also mention the ways of defining test plan. | **13** | 4 | L4-2 |
| **OR** | | | | |
| 14 (b) | Compare and contrast the role of debugging goals and policies in testing. Also explain the steps involved in forming a testing group. | **13** | 4 | L4-2 |
| 15 (a) | With a neat sketch discuss the design and architecture for test automation | **13** | 5 | L2-2 |
| **OR** | | | | |
| 15 (b) | Discuss various metrics and measurements in software testing. Explain various types of progress metrics. | **13** | 5 | L2-2 |

**PART- C (1 x 15 = 15 Marks)**

(Q.No.16 is compulsory)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No** | **Questions** | **Marks** | **CO** | **BL** |
| 16. | The Coin Problem: To calculate the total rupees value for a set of coins. The user inputs the amount of 25p, 50p and 1rs coins. There are size different denominations of coins. The program outputs the total rupees and paise value of the coins to the user.  Input      : number\_of\_coins is an integer  Output    : number\_of\_rupees is an integer 1) Design Description for the Coin Problem2) Design Defects in the Coin Problem3) Coding Defects in the Coin Problem | **5**  **5**  **5** | 2  3  3 | L5-3  L5-3  L5-3 |

**OFFICE OF THE ADDITIONAL CONTROLLER OF EXAMINATIONS (UDs)**

**ANNA UNIVERSITY, CHENNAI – 600 025**

**CHECK LIST / DECLARATION TO BE FILLED BY THE QUESTION PAPER SETTER FOR -R2019**

**NAME OF THE FACULTY MEMBER : J.DURAIMURUGAN**

**COURSE CODE & TITLE : IT5015 & SOFTWARE TESTING**

**REGULATION : 2019**

**MONTH & YEAR : NOV / DEC 2022**

**BRANCH : INFORMATION TECHNOLOGY**

1. Particulars regarding Regulations, Programme, Branch, Semester , - Yes / No

Subject Code & Subject Title, Duration and Maximum Marks is clearly

printed.

2. Marks for each question and / or sub – division is clearly indicated. - Yes / No

3. Questions are evenly distributed over all the 5 units, proportionate to - Yes / No

the number of hours for each unit mentioned in the syllabus.

4. All the questions are within the prescribed syllabus. - Yes / No

5. All the figures / tables are correctly numbered and the text associated - Yes / No

with the figures / tables are readable.

6. For each Question CO, BL are clearly specified - Yes / No

7. List of Tables / Charts permitted is clearly specified. (if yes, please - Yes / No

indicate the list of tables / charts permitted in the space given below).

**NAME OF THE TABLE CHARTS: …………………………………………………….**

**Recommended Distribution of Marks:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Level of Questions** | | **Lower Oder (L1 and L2)** | **Intermediate Order (L3 and L4)** | **Higher Order (L5 and L6)** |
| **Recommended Distribution of Marks (%)** | **UG** | 20 to 35 | Minimum 40 | 15 to 25 |
| **PG** | 10 to 25 | Minimum 50 | 15 to 25 |

* **Part – B Questions of ‘Either OR’ type should test same Bloom’s Level (BL) and same Course Outcome (CO).**
* **In Parts B, Subdivisions are not compulsory and maximum subdivisions shall not exceed three.**
* **Anamolies if any in satisfying the norms of blooms taxonomy that would arise due to the choices [ (Part A) 8/10 and (Part B) 4/5] may be ignored only for June/July 2020 session.**

**Checklist of Mark Distribution:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Question. No** | **Marks / CO** | | | | | **Total**  **Marks** | **Marks / BL** | | | | | |
|  | **CO 1** | **CO 2** | **CO 3** | **CO 4** | **CO 5** | **L1** | **L2** | **L3** | **L4** | **L5** | **L6** |
| 1 | 2 |  |  |  |  | **2** | 2 |  |  |  |  |  |
| 2 | 2 |  |  |  |  | **2** |  | 2 |  |  |  |  |
| 3 |  | 2 |  |  |  | **2** |  |  | 2 |  |  |  |
| 4 |  | 2 |  |  |  | **2** |  |  |  |  | 2 |  |
| 5 |  |  | 2 |  |  | **2** |  |  |  |  | 2 |  |
| 6 |  |  | 2 |  |  | **2** | 2 |  |  |  |  |  |
| 7 |  |  |  | 2 |  | **2** |  | 2 |  |  |  |  |
| 8 |  |  |  | 2 |  | **2** |  |  |  | 2 |  |  |
| 9 |  |  |  |  | 2 | **2** |  |  |  | 2 |  |  |
| 10 |  |  |  |  | 2 | **2** |  |  |  | 2 |  |  |
| 11 | 7 | 6 |  |  |  | **13** |  | 13 |  |  |  |  |
| 12 |  | 7 | 6 |  |  | **13** |  |  | 7 |  | 6 |  |
| 13 |  | 6 | 7 |  |  | **13** |  |  | 6 | 7 |  |  |
| 14 |  |  |  | 13 |  | **13** |  |  |  | 13 |  |  |
| 15 |  |  |  |  | 13 | **13** |  | 13 |  |  |  |  |
| 16 |  | 5 | 10 |  |  | **15** |  |  |  |  | 15 |  |
| **Total** | 11 | 28 | 27 | 17 | 17 | **100** | **L1+L2= 34** | | **L3+L4= 41** | | **L5+L6= 25** | |
| **Mark Distribution in (%)** | 11% | 28% | 27% | 17% | 17% | **100** | 34% | | 41% | | 25% | |

**Note:** In the Check list of Mark Distribution, enter the marks under corresponding Bloom’s Level and Course Outcome (CO) in the appropriate boxes.

I certify that the question paper is correct with respect to the aspects / parameters given above.

The question paper may be considered for the conduct of the End – Semester Examinations.

Date: Signature: