1. Can you explain the advantages of C++, Java and Python respectively ?
2. Please write a code example to resolve the issue of hard-coded file name.
3. How to change if statements nested to a depth of greater than three ? Give an example.
4. Explain the difference between logic artifacts and operational artifacts.
5. What is fault isolation ?
6. What is top down integration, bottom up integration and sandwich integration ?
7. What are the advantages and disadvantages of the three integration methods ?
8. What are two extremes to testing ?
9. What is the art of testing ?
10. What are the equivalence classes defined by range (10, 100) ? Please select test cases for this.
11. What are the three kinds of unit-testing techniques ? Please compare them.
12. What are product testing and acceptance testing ? Please compare them.
13. What is postdelivery maintenance ?
14. What are corrective, adaptive and perfective maintenance ?
15. Why polymorphism and dynamic binding can have negative effects on maintenance ?
16. For the following system, please select test cases for equivalence testing and functional testing :

Consider an automated library circulation system. Every book has a bar code, and every borrower has a card bearing a bar code. When a borrower wishes to check out a book, the librarian scans the bar codes on the book and the borrower's card, and enters C at the computer terminal. Similarly, when a book is returned, it is again scanned and the librarian enters R. Librarians can add books (+) to the library collection or remove them (−). Borrowers can go to a terminal and determine all the books in the library by a particular author (the borrower enters A= followed by the author's name), all the books with a specific title (T= followed by the title), or all the books in a particular subject area (S= followed by the subject area). Finally, if a borrower wants a book currently checked out, the librarian can place a hold on the book so that, when it is returned, it will be held for the borrower who requested it (H= followed by the number of the book).

17. Design the ATM system using object-oriented design:

Consider an automated teller machine (ATM). The user puts a card into a slot and enters a four-digit personal identification number (PIN). If the PIN is incorrect, the card is ejected. Otherwise, the user may perform the following operations on up to four different bank accounts:

(i) Deposit any amount. A receipt is printed showing the date, amount deposited, and account number.

(ii) Withdraw up to $200 in units of $20 (the account may not be overdrawn). In addition to the money, the user is given a receipt showing the date, amount withdrawn, account number, and account balance after the withdrawal.

(iii) Determine the account balance. This is displayed on the screen.

(iv) Transfer funds between two accounts. Again, the account from which the funds are transferred must not be overdrawn. The user is given a receipt showing the date, amount transferred, and the two account numbers.

(v) Quit. The card is ejected.

18. Design the library circulation system using data flow analysis:

Consider an automated library circulation system. Every book has a bar code, and every borrower has a card bearing a bar code. When a borrower wishes to check out a book, the librarian scans the bar codes on the book and the borrower's card, and enters C at the computer terminal. Similarly, when a book is returned, it is again scanned and the librarian enters R. Librarians can add books (+) to the library collection or remove them (−). Borrowers can go to a terminal and determine all the books in the library by a particular author (the borrower enters A= followed by the author's name), all the books with a specific title (T= followed by the title), or all the books in a particular subject area (S= followed by the subject area). Finally, if a borrower wants a book currently checked out, the librarian can place a hold on the book so that, when it is returned, it will be held for the borrower who requested it (H= followed by the number of the book).