UNIVERSITY OF PUNE
[4362]-212
S. E. (Computer Engineering)
Examination - 2013
PROGRAMMING AND PROBLEM SOLVING
(2008 Pattern)

[Total No. of Questions:12]   [Total No. of Printed Pages:3]

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

Instructions :

*(1) Answer **any 3 section from each section***

*(2) Answers to the **two sections** should be written in **separate answer-books**.*

(3) Black figures to the right indicate full marks.

(4) Neat diagrams must be drawn wherever necessary.

(5) Assume suitable data, if necessary.

(6) Black figures to the right indicate full marks.

SECTION-I

Q1 a) You have a new admission to college. There are different transportation   [8]
options that you can use to get your new college (Bus, walking, train, etc.), but
which should you use? Use the six problem-solving steps to show how you could
develop an algorithmic solution to this problem.

b) Evaluate for A=TRUE, B=TRUE, C=FALSE, D=FALSE   [8]
i) R = (A OR B) AND C
ii) R= A AND B OR C
iii) R = B AND C OR A
iv) R = NOT C AND NOT D OR A

OR

Q2 a) Write a short note on Top down design

b) What is function? Explain different types of function with examples.   [6]

c) Write a Logical expression for the following conditions. A company gives a [4] bonus at the end of each financial year. For an employee to get a bonus, the following must be true:

i) The employee has been working at company for more than six months with no negative reports.
ii) The employee has earned more than 50,000 during the financial year.

Q3 a) Briefly discuss the differences between cohesion and coupling. [6]
Discuss how three different approaches to coupling modules can be used.
b) Define the terms call-by-reference and call-by-value. Using appropriate [6] examples discuss when it is appropriate to use each of these in a program.
c) What do you mean by Data Dictionary? Explain with suitable example. [6]

OR

Q4 a) Mobile postpaid connection charges as follows: [12]
First 200 calls   : Free
Extra usage Local : Rs. 1/min
                STD   : Rs. 1.5/min
All customers are charged monthly rental of Rs 300 and service tax of 12.5% on total bill amount. Describe and explain complete steps of solution development to read name of customer, tariff of Local & STD calls and print out the total amount to be charged.
b) Describe Positive logic with suitable example. [6]

Q5 a) Design and explain an algorithm that will find its smallest exact divisor other [8] than one.
b) Design an algorithm that will reverse the digits of a given number. For e.g algorithm should convert the number 123 to the number 321. [8]

OR

Q6 a) Design and explain an algorithm for GCD of two numbers. [8]
b) Design an algorithm for exchanging values of two variables. Also explain [8] any one application with example in which we use this algorithm.

SECTION-II

Q7 a) Write a pseudo algorithm for removal of duplicates from an ordered [8]
   array.

   b) Write short note on : [8]
      i) Pointer technique
      ii) Table Look-Up technique

OR

Q8 a) Design and implement to find the maximum number in a set and position
   i)   where it first occurs
   ii)   where it last occurs. [8]

   b) Write a pseudo algorithm for partition a randomly ordered array of n [8]
      elements into two subsets such that element less than equal to X are in one
      subset and elements are greater than X are in other subset.

Q9 a) Design and implement an algorithm that will search a given text for a [8]
      particular pattern and count number of times the pattern is found.

   b) Write and explain algorithm for text length adjustment. [8]

OR

Q10 a) Explain algorithm for line Editing. [8]

   b) Explain algorithm for left-right justification of a given text. [8]

Q11 a) Write a C++ program for a Books Library that need to track students, [8]
      issue books and its deposit and late fees:
         i)   design classes you would create the application.
         ii)   Write Suitable methods.
         iii) Print Students and its details about deposit and late fees.

   b) Explain Access specifier. [6]

   c) Explain object and classes with example. [4]

OR

Q12 a) Explain the following with example. [18]
         i)   Polymorphism
         ii)   Multiple Inheritance.
         iii) Encapsulation and Data Abstraction.