Digital Assignment

The solution should be uploaded onto VTOP

Maximum marks 10

The programs should be developed and tested independently

Sharing and/or Copying of program file or part thereof will be viewed seriously

Answer **ALL** questions

1. Develop and test an object-oriented application to simulate the rolling of two dice. The application should use an object of Random class once to roll the first die and again to roll the second die. The sum of the two values should then be calculated. Each die can show an integer value from 1 to 6, so the sum of the values will vary from 2 to 12, with 7 being the most frequent sum, and 2 and 12 the least frequent (verify using code). Your application should roll the dice 1296 times. Use a one-dimensional array to tally the number of times each possible sum appears. Display the results in a tabular format showing the sum in one column and the number of times each possible sum occurs in a trial of 1296 times in another column and compute the Chi-square value defined by $\sum \frac{(O-E)^2}{E}$, where O and E are respectively observed and expected number of occurrences of the events (2 to 12) and conclude whether the dice are unbiased. (Chi-square value at 5% level of significance for ten degrees of freedom is 18.307). [5]

2. Develop and test a Java class named Student with the (private) instance fields namely, registration number, name, the date of birth and a list of a maximum of three courses a student has registered in. If a student has registered in less than three courses then use null. Provide constructors for the class showing how one constructor can call some other constructor and include accessor and mutator methods for each of the instance fields. Include a method into the class to compute the age of a student. Create an array of objects of three students after receiving input from the keyboard using object of BufferedReader class and display for each student her/his registration number, name and age in a tabular format with column header. [5]