Following are marks secured by students from B.Sc. CSIT, BCA and BIT program in tests of a college

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| Student  Marks of | A (1) | B (2) | C (3) | D (4) | E(5) | F(6) | G (7) | H (8) | | I (9) | |
| B. Sc. CSIT students in test I | 8 | 12 | 9 | 14 | 4 | 11 | 15 | 7 | | 17 | |
| B. Sc. CSIT students in test II | 6 | 14 | 7 | 13 | 6 | 13 | 12 | 8 | | 18 | |
| B. Sc. CSIT students in test III | 10 | 7 | 11 | 17 | 5 | 16 | 11 | 4 | | 13 | |
| Student  Marks of | J | K | L | M | N | O | P | Q | | | |
| BCA students in test I | 11 | 18 | 5 | 13 | 9 | 12 | 7 | 14 | | | |
| BCA students in test II | 14 | 16 | 8 | 11 | 6 | 17 | 4 | 12 | | | |
| BCA students in test III | 16 | 13 | 6 | 7 | 9 | 15 | 6 | 11 | | | |
| Student  Marks of | R | S | T | U | V | W | X | Y | Z | | α |
| BIT students in test I | 11 | 7 | 12 | 15 | 6 | 5 | 10 | 17 | 9 | | 13 |
| BIT students in test II | 14 | 5 | 10 | 17 | 8 | 6 | 11 | 13 | 6 | | 14 |
| BIT students in test III | 12 | 6 | 7 | 14 | 10 | 11 | 15 | 10 | 5 | | 12 |

1. What do you mean by run test? Are marks of B. Sc. CSIT students in test I taken in random order? Use 5% level of significance
2. Differentiate between type I error and type II error? Are fail and pass of BCA students in test II taken randomly, if 8 is pass mark? Use 1% level of significance
3. What is function of binomial test? Are more than 70% students passed in BIT test I if 8 is pass mark? Use 5% level of significance
4. When you use paired t test? Are marks distribution of B. Sc. CSIT students in test II and B.Sc. CSIT students in test III are identical? Use parametric test at 5% level of significance
5. Differentiate between Z test and t test for single mean. Is average marks 11 of BIT students in test III? Use 5% level of significance. Also find 95% confidence interval for average marks of BIT students in test III.
6. Klj
7. What is rationale of Wilcoxon matched paired signed rank test? Are marks distribution of BCA students in test II and BCA students in test III are identical? Use non parametric test at 5% level of significance
8. Differentiate between confidence level and level of significance. Are average marks of B. Sc. CSIT students in test I and BIT students in test III are identical? Use parametric test at 5% level of significance. Also find 95% confidence interval for difference of average marks of B.Sc. CSIT students in test I and BIT students in test III?
9. What do you know about Mann Whitney U test? Are marks distribution of BCA students in test II and B. Sc. CSIT students in test II are identical? Use non parametric test at 5% level of significance
10. What is function of Cochran Q test? Are pass students of BCA in test I, II and III are same if 8 is pass mark? Use 5% level of significance
11. What is rationale of Friedman’s two way ANOVA test? Are marks distribution of students of BCA identical in test I, II and III? Use non parametric test at 5% level of significance
12. What is function of Kruskal Wallis H test? Are marks distribution of B. Sc. CSIT students in test I, BCA students in test II and BIT students in test III identical? Use non parametric test at 5% level of significance
13. On basis of standard deviation of marks of BIT students in test III, find sample size required to draw from BIT students of 280 at 5% level of significance with margin of error 10%.
14. On basis of proportion of fail student of BCA in test II if 8 is pass mark determine sample size +required to draw from 500 BCA students at 5% level of significance with 5% margin of error.
15. What do you mean by simple random sampling without replacement? From BCA students of test III a sample of size 2 is selected without replacement from passed students given that 8 is pass marks then construct sampling distribution of mean and compare population distribution and sampling distribution of mean. Also compare population mean versus mean of all sample, population variance versus variance of sample mean
16. What do you mean by simple random sampling with replacement? From BCA students of test III a sample of size 2 is selected with replacement from failed students given that 8 is pass marks then construct sampling distribution of mean and compare population distribution and sampling distribution of mean. Also compare population mean versus mean of all sample, population variance versus variance of sample
17. What do you mean by parametric test? Describe its merits and demerits
18. What is meant by non-parametric test? Describe its merits and demerits
19. Considering pass mark is 8 and students of BIT and BCA are four times and five times the given students respectively. Test whether pass percentage of BCA test I is more than BIT test I or not at 5% level of significance

solution:   
Pass mark = 8

Total BIT students = 10 \* 4 = 40 students   
Total BCA students = 8\* 5 = 40 students

Setting up hypothesis:   
Null hypothesis : BCA = BIT

Alternative Hypothesis : BCA > BIT (one tailed test)   
  
z =

z = .23719

for one tailed test at

Since the value of |z| < z alpha , null hypothesis is accepted  
therefore, there is no significant difference in marks of BCA and BIT in their first tests respectively

1. Considering pass mark is 8 and students of BSc CSIT are four times the given students. Test whether pass percentage of B Sc CSIT test I is 80% at 5% level of significance

This can be done with the z test of proportions (a parametric test)

Here given,

Total number of student : 9 \* 4 = 36 students

Hypothesis setup :

Null hypothesis : the passpercentage is 0.8

Alternate hypothesis : the passpercentage is not 0.8

Then ,

Test statstic :

z =

z = - 0 . 18

Then,

alpha = 0.05

z= 1.96  
since the calculated value of z is lesser than the critical value of z, accept null hypothesis  
therefore the 80% percent passed

Here accept null hypothesis. Therefore the proportion for pass is 80%

1. If 8 is pass mark, 10 is second division mark, 13 is first division mark and 17 is distinction marks taking students form B SC CSIT, BCA and BIT of test I, Is marks distribution in fail group, pass division group, second division group, first division group and distinction group uniformly distributed? Use 5% level of significance.

Kai sq division of attributes (similar to independence of attributes, but there are multiple attributes and multiple groups)

1. If 8 is pass mark, 10 is second division mark, 13 is first division mark and 17 is distinction marks. Taking students form BCA and BIT of test I, Is marks distribution of BCA and BIT students is same in test I. Use 5% level of significance
2. What is mean by attribute? If 8 is pass mark, taking students form BIT of test I and test II. Test whether there is association between result and test at 5% level of significance

Attribute refers to the characteristic of a particular data that differs one data from one another in a dataset. For example in a set of marks obtained by students in tests, the data can be categorized as per two characteristics : being passed or failed

Similarly, for it can also be categorized as 1st division, 2nd division , etc.

From kai sq test of independence of attributes we check that if the occurrence of those attributes are independent of each other or dependent of each other.