Python Questions

1. C)
2. C)
3. C)
4. A)
5. D)
6. C)
7. A)
8. A)
9. A,C
10. A,B
11.

```
def fact_num(num):
        factorial = 1
         if num < 0:
                print("Sorry, factorial does not exist for negative numbers")
        elif num == 0:
                 print("The factorial of 0 is 1")
        else:
                 for i in range(1,num + 1):
                         factorial = factorial*i
                print("The factorial of",num,"is",factorial)
```

12.

```
def prime_composite(num):

   flag = False

   # prime numbers are greater than 1
   if num > 1:
      # check for factors
      for i in range(2, num):
         if (num % i) == 0:
            # if factor is found, set flag to True
            flag = True
            # break out of loop
            break

   # check if flag is True
   if flag:
      print(num, "is a composite number")
   else:
      print(num, "is a prime number")
```

13.

```
def if_palindrome(s):
   return s == s[::-1]


# Driver code
s = "malayalam"
```

```
ans = isPalindrome(s)

if ans:
   print("Yes")
else:
   print("No")
```

14.

```
def third_side(perpendicular,base):
   side = np.sqrt((perpendicular)**2 + (base)**2)
   return side
```

15.

```
string = 'George'

all_freq = {}

for i in string:
   if i in all_freq:
      all_freq[i] += 1
   else:
      all_freq[i] = 1
```

Statistics Questions

1. b)
2. b)
3. b)
4. b)
5. a)
6. d)
7. b)
8. a)
9. a)
10. c)
11. a)
12. c)

13. Statistical Analysis. Analysis of Variance, i.e. ANOVA in SPSS, is used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables.

14. The factorial ANOVA has a several assumptions that need to be fulfilled – (1) interval data of the dependent variable, (2) normality, (3) homoscedasticity, and (4) no multicollinearity.

15. The only difference between one-way and two-way ANOVA is the number of independent variables. A one-way ANOVA has one independent variable, while a two-way ANOVA has two.

Machine Learning Questions

1. B)
2. A)
3. A)
4. C)
5. D)
6. B)
7. C)
8. A),D)
9. B)
10. A), B)
11. We don't use one hot encoding in the ordinal data. We can use Label Encoding or Ordinal Encoder in such cases.

12. SMOTE, under-sampling : tokem links, ADASYN

13. The key difference between ADASYN and SMOTE is that the former uses a density distribution, as a criterion to automatically decide the number of synthetic samples that must be generated for each minority sample by adaptively changing the weights of the different minority samples to compensate for the skewed distributions. The latter generates the same number of synthetic samples for each original minority sample.

14. GridSearchCV function helps to loop through predefined hyper-parameters and fit your estimator (model) on your training set. This is not advisable in large datasets as this can take a lot of computational time. RandomizedSearchCV can be used in such cases as it picks parameters randomly and hence has more chances of completing the task faster.

15. -- **M.A.E (Mean Absolute Error)** : It is the simplest & very widely used evaluation technique. It is simply the mean of difference b/w actual & predicted values.

-- **MSE(Mean Squared Error) :** It takes the average of the square of the error. Here, the error is the difference b/w actual & predicted values.

-- **R.M.S.E (Root Mean Squared Error)** : It squares the error & then it takes the square root of the total average function.

-- **R-Squared :** This method helps us to calculate the relative error. This technique helps us to judge, which algorithm is better based on their mean squared errors.