Q 1.

```
V= int(input("Enter the value of design speed: "))
R= int(input("Enter the value of Radius of curvature: "))
N= int(input("Enter the value of slope: "))
W= float(input("Enter the value of width of road including extra widening: "))
emax=float(input("'enter the value for plain terain:"))
ecal= (V*V/(225*R))
print("The value of Super elevation:",ecal)
if ecal<emax:
 print(ecal)
else:
 print(emax)
Ls=(emax*N*W/2)
print("The length of transition curve:", Ls)
```

```
Enter the value of design speed: 65
Enter the value of Radius of curvature: 220
Enter the value of slope: 150
Enter the value of width of road including extra widening: 7.5
'enter the value for plain terain:0.07
The value of Super elevation: 0.08583535353535353535
0.07
The length of transition curve: 39.37500000000001
```

Q 2.

```
R = int(input(" Constant R: "))
C = int (input (" Constant C: "))
import numpy as geek
A = int(input ("Total Data Values for EWL Constant: "))
B = int(input ("Total Data Values for AADT: "))
EWL_Constant = []
AADT = []
for i in range (1, A+1):
 print("Enter EWL Constant:")
 A = float (input())
 EWL_Constant. append(A)
for j in range (1, B+1):
 print("Enter AADT: ")
 B = float (input ())
 AADT. append (B)
product = geek.dot(EWL_Constant, AADT)
# print(" Dot Product ; \n" , product)
Total_EWL = product
print(" Total_EWL :", Total_EWL)
print("EWL after 60 years:", Total_EWL*1.6)
TI = 1.35*(((1.6*Total_EWL)+(product)/(2))**0.11)
print("Traffic Index : ", TI)
Thickness = 0.166*TI*(90-R)/(C**0.2)
print ("Pavement Thickness: ", Thickness, "cm")
```

```
 Constant R: 48
 Constant C: 16
Total Data Values for EWL Constant: 4
Total Data Values for AADT: 4
Enter EWL Constant:
330
Enter EWL Constant:
1070
Enter EWL Constant:
2460
Enter EWL Constant:
4620
Enter AADT:
3750
Enter AADT:
```

```
470
Enter AADT:
320
Enter AADT:
120
 Total_EWL : 3082000.0
EWL after 60 years: 4931200.0
Traffic Index :  7.577910657490486
Pavement Thickness:  30.34470100391634 cm
```

Q 3.

```
P = float(input("Load. In kg: "))
p = float(input("Tyre pressure kg/c^2: "))
M = int(input("Total Number of layers is gives Pavement : "))
pi = 3.14159
CBR = []
for i in range (1, M+1):
 print("California bearing Ratio of Material in %")
 CBR_value = float(input())
 CBR.append(CBR_value)
 T = ((1.75*P)/(CBR_value)-(P/(p*pi)))**0.5
 print("Thickness above this layers : ",T,"cm")
print("Given that hitunen layer of 4 cm")
```

```
Load. In kg: 4085
Tyre pressure kg/c^2: 7
Total Number of layers is gives Pavement : 3
California bearing Ratio of Material in %
4.38
Thickness above this layers :  38.031276487723645 cm
California bearing Ratio of Material in %
6
Thickness above this layers :  31.712799015896838 cm
California bearing Ratio of Material in %
12
Thickness above this layers :  20.247776538573337 cm
Given that hitunen layer of 4 cm
```