Machine Learning, test 3

Name: .....

Student Number: .....

Complete the following statements about sampling methods

Uniform sampling ….(1)…….	A. is used to draw samples from normal distribution
Rejection sampling ….(2)…….	B. is to select samples from proposal distribution with the probability given by the value of the source distribution
Importance sampling ….(3)…….	C. is used to draw distribution within an interval with the same probability
Box-Muller method ….(4)…….	D. is to draw samples with weights given by the proposal and source distribution.
	E. is to select samples from mixture distribution

1C, 2B, 3D, 4A

Circle T if the following statement is true or F if it is false

5. We can draw sample from normal distribution using uniform distribution	T	F
6. We can draw sample from GMM distribution using one uniform/multinomial distribution and another Gaussian distribution	T	F
7. When we sample x ~ U(0, 1) then y = (x<0.5) is an uniform distribution	T	F
8. When we sample x1 ~ U(0, 1) and x2 ~ U(0, 1) then y = x1-x2 is zero	T	F

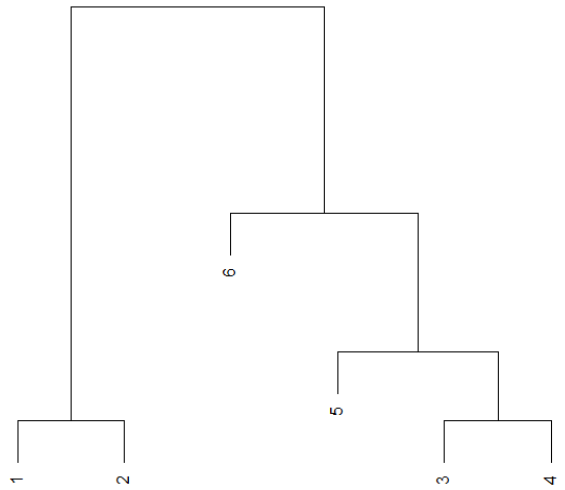
5T, 6T, 7T, 8F

Complete the following statements about sampling methods for optimization

Gibss sampling ….(9)…….	A. is used to explore all the points the constrained subspace with the same probability
Simulated Annealing ….(10)…….	B. is to list or to dump all the point in the constrained subspace with certain order
Uniform sampling ….(11)…….	C. is to select samples from Gausian distribution
Enumeration ….(12)…….	D. is to explore the space and move on to the next state with certain probability based on a control variable.
	E. is to generate the sequence of points based on the conditional distribution of one variable given the rest.

9E, 10D, 11A, 12B

Label the nodes



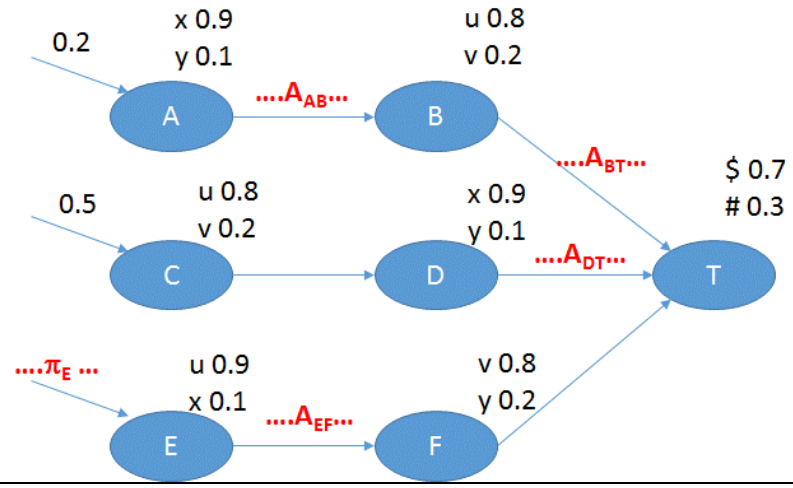
13. When the number of clusters is 2 then the label will be

1	2	3	4	5	6
1	**1**	**2**	**2**	**2**	**2**

14. When the number of clusters is 3 then the label will be

1	2	3	4	5	6
1	**1**	**2**	**2**	**2**	**3**

Complete the values for the model



15. The transition probability

π_E = ……**0.3**……

A_{AB} = ……**1**……

A_{EF} = ……**1**……

A_{BT} = ……**1**……

A_{DT} = ……**1**……

Remember the sum-to-one

Complete the alpha table with the model above and the given sequence S = (x, u, $)

16. The first column	17. The second column
alpha(A, 1) = …**0.18**……	alpha(A, 2) = …**0**……
alpha(B, 1) = …**0**……	alpha(B, 2) = …**0.144**……
alpha(C, 1) = ……**0**……	alpha(C, 2) = ……**0**……
alpha(D, 1) = …**0.18**……	alpha(D, 2) = ……**0**……
alpha(E, 1) = ……0.05……	alpha(E, 2) = ……**0**……
alpha(F, 1) = ……**0**……	alpha(F, 2) = ……**0**……
alpha(T, 1) = ……**0**……	alpha(T, 2) = ……**0**……