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4. Solution: For any cut t , that makes the graph G as disconnected is a RKMC cut.For the given graph one of the possible cut is : partition:[a,b,c,d,e,f] [g,h] cross-edges:[U,T,S]
5. Solution: The required lower bound is $\frac{2}{n *(n-1)}$, therefore $\frac{1}{28}$, where $\mathrm{n}=8$.
6. Solution: There are 3 min-cuts and for each min-cut, calculate the probability and then add them up. Fix a min-cut let's say $\mathrm{X}=\mathrm{a}, \mathrm{Y}=$ rest of the vertices. Then, the probability that this cut is output is when J and K come at the end of the ordering or J and K are the beginning and P , N , and M come at the end.So basically you calculate the probability that these orders are sampled. For example, the probability that J and K come at the end of the order is equal to $\frac{10!* 2}{12!}$. Therefore the required exact probability is close to 0.5 . Hence any answer between 0.4 and 0.5 works.
7. Solution: The probability that 1 RKMC execution fails to find a min cut on a graph $\leq 1-\mathrm{p}$ Probability that all t executions of RKMC fails $\leq(1-p)^{t}$ Therefore, probability that at-least one of the $t$ executions outputs a min-cut $\geq 1-(1-p)^{t}$.
Therefore, $1-(1-p)^{t} \geq 0.9$
