1. $E[T(x)] = \int_0^\infty t \cdot f_{T(x)}(t)\, dt = \int_0^\infty {}_tp_x\, dt$

2. $E[T(y)] = \int_0^\infty t\, f_{T(y)}(t)\, dt = \int_0^\infty {}_tp_y\, dt$

3. $E[T(\overline{n|})] = n$

4. $T(x:\overline{n|}) = \begin{cases} T(x) & T(x) < n \\ n & T(x) > n \end{cases}$

$$E[T(x:\overline{n|})] = \int_0^n t\, f_{T(x)}(t)\, dt + \int_n^\infty n\, f_{T(x)}(t)\, dt$$

$$= \int_0^n t\, f_{T(x)}(t)\, dt + n \cdot {}_np_x$$

5. $T(\overset{1}{x}:\overline{n|}) = \begin{cases} T(x) & T(x) < n \\ \infty & T(x) \geq n \end{cases}$

$E[T(\overset{1}{x}:\overline{n|})] = \infty$

6. $T(x:\overset{1}{\overline{n|}}) = \begin{cases} \infty & T(x) < n \\ n & T(x) \geq n \end{cases}$

$E[T(x:\overset{1}{\overline{n|}})] = \infty$

7. $E[K(x)] = \sum_{k=0}^{\infty} k \cdot P_r(K(x)=k) = \sum_{k=1}^{\infty} {}_kP_x$

8. $E[K(y)] = \sum_{k=0}^{\infty} k\, P_r(K(y)=k) = \sum_{k=1}^{\infty} {}_kP_y$

9. $E[K(\overline{n|})] = n$

10. $K(x:\overline{n|}) = \begin{cases} K(x) & K(x) < n \\ n & K(x) \geq n \end{cases}$

$$E[K(x:\overline{n|})] = \sum_{k=0}^{n-1} k\, P_r(K(x)=k) + \sum_{k=n}^{\infty} n \cdot P_r(K(x)=k)$$

$$= \sum_{k=0}^{n-1} k\, P_r(K(x)=k) + n \cdot {}_nP_x$$

11. $E[K(\overset{1}{x}:\overline{n|})] = \infty$

12. $E[K(x:\overset{1}{\overline{n|}})] = \infty$

} similar to continuous cases.

13. $E[T(x:y)] = \int_0^{\infty} t \cdot f_{T(x:y)}(t)\, dt = \int_0^{\infty} {}_tP_{x:y}\, dt = \int_0^{\infty} {}_tP_x \cdot {}_tP_y\, dt$

14. $E[T(\overline{x:y})] = \int_0^{\infty} t\, f_{T(\overline{x:y})}(t)\, dt = \int_0^{\infty} {}_tP_{\overline{x:y}}\, dt = \int_0^{\infty} {}_tP_x + {}_tP_y - {}_tP_{x:y}\, dt$

15. $E[K(x:y)] = \sum_{k=0}^{\infty} k \, Pr(K(x:y)=k) = \sum_{k=1}^{\infty} {}_kp_x \cdot {}_kp_y$

16. $E[k(\overline{x:y})] = E[k(x)] + E[k(y)] - E[k(x:y)]$

$= \sum_{k=1}^{\infty} {}_kp_x + {}_kp_y - {}_kp_x \, {}_kp_y$ (Alternative way to solve $\overline{x:y}$, compared with Q 14)

17. $T(\overset{1}{x}:y) = \begin{cases} T(x) & T(x) < T(y) \\ \infty & T(x) \geq T(y) \end{cases}$

$E[T(\overset{1}{x}:y)] = \infty$

18. $T(x:\overset{2}{y}) = \begin{cases} T(y) & T(x) < T(y) \\ \infty & T(x) \geq T(y) \end{cases}$

$E[T(x:\overset{2}{y})] = \infty$

19. $E[K(\overset{1}{x}:y)] = \infty$

20 $E[K(x:\overset{2}{y})] = \infty$

} similar to continuous cases.