9. 解:

$$f(x,y)=\begin{cases}cx^2y & x^2\le y\le 1\\ 0 & \text{otherwise}\end{cases}$$

(1)

由题意知,

$$\begin{aligned}\iint\limits_D f(x,y)dxdy&=\int_{-1}^{1}\int_{x^2}^{1}cx^2ydxdy\\&=c\int_{-1}^{1}x^2\cdot\frac{1}{2}(1-x^4)dx\\&=\frac{4c}{21}\\&=1\end{aligned}$$

故, $c=\frac{21}{4}$

(2)

$$\begin{aligned}f_X(x)&=\frac{21}{4}\int_{x^2}^{1}x^2ydy=\frac{21}{8}(x^2-x^6)\\ f_Y(y)&=\frac{21}{4}\int_{-\sqrt{y}}^{\sqrt{y}}x^2ydx=\frac{7}{2}y^{\frac{3}{2}}\end{aligned}$$

故,

$$\begin{aligned}f_X(x)&=\begin{cases}\frac{21}{8}(x^2-x^6) & |x|\le 1\\ 0 & \text{otherwise}\end{cases}\\ f_Y(y)&=\begin{cases}\frac{7}{2}y^{\frac{3}{2}} & 0\le y\le 1\\ 0 & \text{otherwise}\end{cases}\end{aligned}$$

11. 解:

(1)

$$
\begin{aligned}
f_X(x) &= \sum_{y=0}^{x} \frac{e^{-14} 7.14^y 6.86^{x-y}}{y!(x-y)!} \\
&= \frac{e^{-14}}{x!} \sum_{y=0}^{x} \binom{x}{y} 7.14^y 6.86^{x-y} \\
&= \frac{e^{-14}}{x!} (7.14 + 6.86)^x \\
&= \frac{14^x e^{-14}}{x!} \\
f_Y(y) &= \sum_{x=y}^{\infty} \frac{e^{-14} 7.14^y 6.86^{x-y}}{y!(x-y)!} \\
&= \sum_{x=0}^{\infty} \frac{e^{-14} 7.14^y 6.86^{x}}{y!x!} \\
&= \frac{7.14^y e^{-14}}{y!} \sum_{x=0}^{\infty} \frac{6.86^x}{x!} \\
&= \frac{7.14^y e^{-14}}{y!} \cdot e^{6.86} \\
&= \frac{7.14^y}{e^{7.14} y!}
\end{aligned}
$$