Engineering Mathematics-2 2015 course Unit-6 Double Integration

Q.1) The value of $\int_0^{\frac{\pi}{2}}\int_0^{\frac{\pi}{2}} \sin x \, dx \, dy$ is

A)0

B)1

C)$\frac{\pi}{2}$

D)π

Ans-C

Q.2) The value of $\int_0^{\frac{\pi}{2}}\int_0^{\frac{\pi}{2}} \cos x \, dx \, dy$ is

A)$\frac{\pi}{2}$

B)1

C)0

D)π

Ans-A

Q.3) The value of $\int_0^{1}\int_0^{y} x \, dx \, dy$ is

A)$\frac{1}{2}$

B)$\frac{1}{3}$

C)$\frac{1}{8}$

D)$\frac{1}{6}$

Ans-D

Q.4) The value of $\int_0^{1}\int_0^{x} e^y \, dx \, dy$ is

A)e^2

B)$e-2$

C)e

D)$\frac{1}{2}(e^2-1)$

Ans: B

Q.5)Using polar transformation $x = r\cos\theta\,, y = r\sin\theta$ the Cartesian double integral $\iint_R f(x,y)dxdy$ becomes

A) $\iint_R f(r,\theta)drd\theta$

B) $\iint_R f(r,\theta) r dr d\theta$

C) $\iint_R f(r,\theta) r^2 dr d\theta$

D) $\iint_R f(r,\theta) \theta dr d\theta$

Ans:B

Q.6) On changing the order of integration of $\int_0^1 \int_0^x f(x.y)dxdy$ becomes

A) $\int_0^1 \int_0^1 f(x.y)dxdy$

B) $\int_0^1 \int_0^y f(x.y)dxdy$

C) $\int_0^1 \int_1^y f(x.y)dxdy$

D) $\int_0^1 \int_y^1 f(x.y)dxdy$

Ans: D

Q.7) On changing the order of integration of $\int_0^1 \int_{x^2}^1 f(x.y)dxdy$ becomes

A) $\int_0^1 \int_0^{\sqrt{y}} f(x.y)dxdy$

B) $\int_0^1 \int_0^{-\sqrt{y}} f(x.y)dxdy$

C) $\int_0^1 \int_0^{\sqrt{x}} f(x.y)dxdy$

D) $\int_0^1 \int_0^{-\sqrt{x}} f(x.y)dxdy$

Ans: A

Q.8) on transforming into the polar co-ordinates the double integration $\int_0^1 \int_0^{\sqrt{1-x^2}} f(x.y)dxdy$ becomes

A) $\int_0^{\pi} \left\{\int_0^1 f(r,\theta) r dr\right\} d\theta$

B) $\int_0^{\frac{\pi}{2}} \left\{\int_0^1 f(r,\theta) r d\theta\right\} dr$

C) $\int_0^{\frac{\pi}{2}} \left\{\int_0^1 f(r,\theta) r dr\right\} d\theta$

D) $\int_0^{2\pi} \left\{\int_0^1 f(r,\theta) r dr\right\} d\theta$

Ans: C

Q.9) By considering the strip parallel to Y-axis the integration $\iint_R f(x,y)dxdy$ over the area of triangle whose vertices are $(0,1)$, $(1,1)$ and $(1,2)$ becomes

A) $\int_0^1 \int_1^{x-1} f(x,y)dxdy$

B) $\int_0^1 \int_1^{x+1} f(x,y)\,dxdy$

C) $\int_0^1 \int_0^{x+1} f(x,y)\,dxdy$

D) $\int_0^1 \int_1^{x-1} f(x,y)\,dxdy$

Ans: B

Q.10) By considering the strip parallel to X-axis the integration $\iint_R f(x,y)\,dxdy$ where R is the region bounded by $y = x^2$ and $y^2 = -x$ becomes

A) $\int_0^1 \int_{\sqrt{y}}^{-y^2} (x,y)\,dxdy$

B) $\int_0^1 \int_{-\sqrt{y}}^{y^2} (x,y)\,dxdy$

C) $\int_0^1 \int_{-\sqrt{y}}^{-y^2} (x,y)\,dxdy$

D) $\int_0^1 \int_{\sqrt{y}}^{y^2} (x,y)\,dxdy$

Ans: C

Q.11) on transforming into the polar co-ordinates the double integration $\int_0^a \int_0^{\sqrt{a^2-y^2}} e^{-x^2-y^2}\,dxdy$ becomes

A) $\int_0^{\frac{\pi}{2}} \int_0^a e^{-r^2}\,drd\theta$

B) $\int_0^{\frac{\pi}{2}} \int_0^a e^{-r^2} r^2\,drd\theta$

C) $\int_0^{\frac{\pi}{2}} \int_0^a e^{-r^2} r\,drd\theta$

D) $\int_0^{\frac{\pi}{2}} \int_0^a e^{-r} r\,drd\theta$

Ans: B

Q.12)To find the area of upper half of a cardioid $r = a(1+\cos\theta)$ the double integral becomes

A) $\int_0^{\pi} \int_0^{a(1+\cos\theta)} r\,drd\theta$

B) $\int_0^{\pi} \int_0^{a(1+\cos\theta)} drd\theta$

C) $\int_0^{2\pi} \int_0^{a(1+\cos\theta)} r^2\,drd\theta$

D) $\int_0^{2\pi} \int_0^{a(1+\cos\theta)} r\,drd\theta$

Ans: A

Q.13) To find the area of a complete circle $x^2 + y^2 = a^2$ the double integral becomes

A) $2\int_0^{\frac{\pi}{2}} \int_0^a r\,drd\theta$

B) $4\int_0^{\frac{\pi}{2}}\int_0^a drd\theta$

C) $2\int_0^{\frac{\pi}{2}}\int_0^a r^2drd\theta$

D)$4\int_0^{\frac{\pi}{2}}\int_0^a rdrd\theta$

Ans: D