Q		Answer
1a	$\lim_{(x,y)\to(x_o,y_o)} f(x,y)$ will exist if (a) Limit is path dependent (b) Limit is not finite (c) Limit is both finite and unique along all possible paths reaching (x_o, y_o) (d) None of these	c
2a	The value of $\lim_{(x,y)\to(0,0)} \frac{x}{\sqrt{x^2+y^2}}$ (a) 0 (b) 1 (c) Does not exist (d) 1/2	c
3a	A function $z = f(x,y)$ is said to be continuous at a point (x_o, y_o), if (a) $f(x,y)$ is defined at the point (x_o, y_o) (b) $\lim_{(x,y)\to(x_o,y_o)} f(x,y)$ exist (c) $\lim_{(x,y)\to(x_o,y_o)} f(x,y) = f(x_o, y_o)$ (d) All of above	d
4a	Partial derivatives are used when (a) Function depends on one variable (b) Function depends on more than one variable (c) Function is constant (d) None of these	b
5a	If $f(x,y,z) = (xy)^{sinz}$ then value of $\frac{\partial f}{\partial x}$ at $\left(3, 5, \frac{\pi}{2}\right)$ is (a) 3 (b) 5 (c) 0 (d) 15	b
6a	Composite function is defined as (a) $y = f(x)$ (b) $z = f(x,y)$ (c) $f(x,y) = constant$ (d) $z = f(x,y), x = g(t), y = h(t)$	d
7a	If $x^y + y^x = c$, where c is a constant then value of $\frac{dy}{dx}$ at (1, 1) is (a) 0 (b) 1 (c) -1 (d) -2	c
8a	If $f(x,y) = x^y, (x,y) \neq (0,0)$ then the value of f_{xy} is (a) $x^{y-1}(1 + ylogx)$ (b) $x^y(1 + ylogx)$ (c) $y^{x-1}(1 + ylogx)$ (d) $x^{y-1}(1 + logx)$	a
9a	$\lim_{h\to0} \frac{f(x+h,y)-f(x,y)}{h}$ if exist, called partial derivative of $f(x,y)$ with respect to (a) x at (a,b) (b) y at (a,b) (c) x at (x,y) (d) y at (x,y)	c
10a	If $u = f(y-z, z-x, x-y)$, then the value of $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z}$ is (a) 0 (b) 3 (c) 1 (d) None of these	a
11a	If $f(x,y) = c$, then the value of $\frac{dx}{dy}$ is (a) $\frac{\partial f}{\partial x}$ (b) $\frac{\partial f}{\partial y}$ (c) $-\frac{\partial f/\partial x}{\partial f/\partial y}$ (d) $-\frac{\partial f/\partial y}{\partial f/\partial x}$	d
12a	If $f(x,y) = e^{xy}$ then the value of $\frac{\partial f}{\partial y}$ at (0,0) is (a) 0 (b) 1 (c) e (d) None of these	a
13a	If $z = f(x,y), x = g(t), y = h(t)$, then the value of $\frac{dz}{dt}$ is	c

	(a) $\frac{dz}{dx}\frac{dx}{dt}+\frac{dz}{dy}\frac{dy}{dt}$ (b) $-\frac{\frac{\partial z}{\partial x}}{\frac{\partial z}{\partial y}}$ (c) $\frac{\partial z}{\partial x}\frac{dx}{dt}+\frac{\partial z}{\partial y}\frac{dy}{dt}$ (d) $\frac{\partial z}{\partial x}\frac{\partial x}{\partial t}+\frac{\partial z}{\partial y}\frac{\partial y}{\partial t}$	
14a	If $u=\sqrt{y^2-x^2}\sin^{-1}\left(\frac{x}{y}\right)$, then $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}$ a) 0 b) u c) $2u$ d) $3u$	b
15a	$f(x,y)=\frac{\sqrt{x}-\sqrt{y}}{\sqrt{x}+\sqrt{y}}$ is a homogeneous function of degree a) 0 b) 1 c) 2 d) 3	a
16a	Function $z=f(x,y)$ is homogeneous of degree n if it can be written as (a) $z=x^nf(y)$ (b) $z=y^nf(x)$ (c) $z=y^nf(y/x)$ (d) $z=y^nf(x/y)$	d
17a	Which of the given options represent a homogeneous function ? (a) $\frac{x^2+y^3}{2xy}$ (b) $\sin^{-1}\left(\frac{x^4+y^4}{x^3}\right)$ (c) $\tan^{-1}\left(\frac{x^2y^2}{2x^4+y^4}\right)$ (d) None of these	c
18a	If a homogeneous function $u(x,y)$ satisfies $x^2\frac{\partial^2u}{\partial x^2}+2xy\frac{\partial^2u}{\partial x\partial y}+y^2\frac{\partial^2u}{\partial y^2}=30u$, then the degree of $u(x,y)$ is (a) 12 (b) 6 (c) 4 (d) 3	b
19a	If $u=\frac{y^3-x^3}{y^2+x^2}$ then $x^2\frac{\partial^2u}{\partial x^2}+2xy\frac{\partial^2u}{\partial x\partial y}+y^2\frac{\partial^2u}{\partial y^2}$ is a) $3u$ b) 2u c) u d) 0	d
20a	If $z=f(x,y)$ then which of the following conditions will give us point of minima at a stationary point (a) $rt-s^2>0$ and $r>0$ (b) $rt-s^2>0$ and $r<0$ (c) $rt-s^2=0$ (d) $rt-s^2<0$	a
21a	If $f(x,y)=x^3-y^3-2xy+6$ stationary points of $f(x,y)$ is (a) (0,0) & $\left(-\frac{2}{3},\frac{2}{3}\right)$ (b) (0,0) & $\left(\frac{2}{3},\frac{2}{3}\right)$ (c) (0,0) & $\left(\frac{2}{3},-\frac{2}{3}\right)$ (d) None of these	b
22a	For the function $f(x,y)=2xy-5x^2-2y^2+4x+4y-4$ the critical point $\left(\frac{2}{3},\frac{4}{3}\right)$ is a point of a) Maxima b) Minima c) Saddle point d) None of these	c
23a	For the function $f(x,y)=x^2-4xy+y^2+6y+2$ the critical point $(2,1)$ is a point of a) Maxima b) Minima c) Saddle point d) None of these	c
24a	For the function $f(x,y)=x^4+y^4+z^4-4xyz$ the critical point $(1,1,1)$ is a point of a) Maxima b) Minima c) Saddle point d) None of these	