UNIT – II		
CO- 3 – Vector Differential Calculus		
1.	If $\varphi = x^3 + y^3 - 2z$then $\nabla\varphi$ at (1, -1, 1) is	
	a) $3\hat{\imath} + 3\hat{\jmath} - 2\hat{k}$	b) 4
	c) $3\hat{\imath} + 3\hat{\jmath}$	d) $\hat{\imath} + \hat{\jmath} - \hat{k}$
2.	$\vec{F}$ is said to be solenoidal if	
	a) $\nabla\vec{F} = 0$	b) $\nabla \bullet \vec{F} = 0$
	c) $\nabla \times \vec{F} = \vec{0}$	d) $\nabla\left(\nabla\vec{F}\right) = 0$
3.	If $f(x, y) = 2xy + y^2$ then Hessian of f is	
	a) $\begin{bmatrix} 2 & 0 \\ 2 & 0 \end{bmatrix}$	b) $\begin{bmatrix} 2 & 0 \\ 2 & 2 \end{bmatrix}$
	c) $\begin{bmatrix} 0 & 0 \\ 2 & 2 \end{bmatrix}$	d) $\begin{bmatrix} 2 & 2 \\ 2 & 2 \end{bmatrix}$
4.	If $\vec{F} = ax\hat{\imath} + b\hat{\jmath}$ where a, b are constants, is irrotational, then which of the following is true?	
	a) $\nabla \times \vec{F} = a$	b) $\nabla \times \vec{F}$ is a scalar quantity
	c) $\nabla \times \vec{F} = \vec{0}$	d) $\nabla \times \vec{F} \neq \vec{0}$
5.	$\vec{F}$ is said to be irrotational if	
	a) $\nabla\left(\nabla\vec{F}\right) = 0$	b) $\nabla\vec{F} = 0$
	c) $\nabla \bullet \vec{F} = 0$	d) $\nabla \times \vec{F} = \vec{0}$
6.	If $\varphi = x^2 + y^2 - z$ then $\nabla\varphi$ at (1, 1, 1) is	
	a) $2\hat{\imath} + 2\hat{\jmath} - \hat{k}$	b) $2\hat{\imath} + 2\hat{\jmath}$
	c) $\hat{\imath} + \hat{\jmath} + \hat{k}$	d) 3
7.	If $\vec{F} = ax\hat{\imath} + by\hat{\jmath}$ where a, b are constants, is solenoidal then which of the following is false?	
	a) $a + b = 0$	b) $\nabla \bullet \vec{F} = 0$
	c) $\nabla \bullet \vec{F}$ is a scalar quantity	d) $\nabla \bullet \vec{F}$ is a vector quantity
8.	If $f(x, y) = xy + x^2$ then Hessian of $f$is	
	a) $\begin{bmatrix} 2 & 1 \\ 1 & 0 \end{bmatrix}$	b) $\begin{bmatrix} 2 & 0 \\ 2 & 1 \end{bmatrix}$
	c) $\begin{bmatrix} 0 & 0 \\ 2 & 2 \end{bmatrix}$	d) $\begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$
9.	If $\vec{F} = 2x\hat{\imath} + 3y^2\hat{\jmath} + 4z^3\hat{k}$ then divergence of $\vec{F}$ at (1,1,1) is	

	a) $2\hat{\imath} + 6\hat{\jmath} + 12\hat{k}$	b) 20
	c) $2\hat{\imath} + 3\hat{\jmath} + 4\hat{k}$	d) $x\hat{\imath} + y\hat{\jmath}$
10.	If $f(x, y) = xy - x^4$ then Hessian of f is	
	a) $\begin{bmatrix} -12x^2 & 1 \\ 1 & 0 \end{bmatrix}$	b) $\begin{bmatrix} -12 & 0 \\ 2 & 1 \end{bmatrix}$
	c) $\begin{bmatrix} x^2 & 0 \\ 1 & 2 \end{bmatrix}$	d) $\begin{bmatrix} 1 & 1 \\ x & 2 \end{bmatrix}$
11.	If $\vec{F} = x\hat{\imath} + z\hat{\jmath} + y\hat{k}$ then curl of $\vec{F}$ is	
	a) $\vec{0}$	b) $\hat{\imath} + \hat{\jmath} + \hat{k}$
	c) $\hat{\imath} + \hat{k}$	d) $\hat{\imath} + \hat{\jmath}$
12.	If $\vec{F} = a^2x\hat{\imath} - b^2y\hat{\jmath}$ where a, b are constants, is solenoidal, then which of the following is false?	
	a) $\nabla \bullet \vec{F} = 0$	b) $\nabla \bullet \vec{F}$ is a scalar quantity
	c) $a^2 - b^2 = 0$	d) $a^2 + b^2 = 0$
13.	If $\varphi = x^2 + y - z - 1$ then $\lvert\nabla\varphi\rvert$ at (1, 0, 0) is:	
	a) 2	b) $\sqrt{6}$
	c) 6	d) $6\sqrt{6}$
14.	If $\vec{F} = xyz\hat{\imath} + 3x^2y\hat{\jmath} + (xz^2 - y^2z)\hat{k}$ then divergence of $\vec{F}$ at the point $(2, -1, 1)$ is:	
	a) 16	b) $-\hat{\imath} + 12\hat{\jmath} + 5\hat{k}$
	c) $\hat{\imath} + 2\hat{\jmath} + 5\hat{k}$	d) 14
15.	A vector field which has a vanishing curl is called	
	a) an irrotational vector field	b) solenoidal vector field
	c) scalar field	d) none of these
16.	If $\vec{F} = ax\hat{\imath} + b\hat{\jmath}$ where a, b are constants, is irrotational, then which of the following is true?	
	a) $\nabla \times \vec{F} = a$	b) $\nabla \times \vec{F}$ is a scalar quantity
	c) $\nabla \times \vec{F} = \vec{0}$	d) $\nabla \times \vec{F} = \vec{0}$
17.	The gradient of $\varphi = xyz$ is	
	a) $yz\hat{\imath} + xz\hat{\jmath} + xy\hat{k}$	b) $yz\hat{\imath} + xy\hat{\jmath} + xz\hat{k}$
	c) $x\hat{\imath} + y\hat{\jmath} + z\hat{k}$	d) $x\hat{\imath} + y\hat{\jmath} - z\hat{k}$
18.	A vector field with vanishing divergence is called	
	a) an irrotational vector field	b) solenoidal vector field

	c) scalar field	d) none of these
19.	If $f(x,y) = 2xy + 7x^2$ then Hessian of f is	
	a) $\begin{bmatrix} 14 & 2 \\ 2 & 0 \end{bmatrix}$	b) $\begin{bmatrix} 2 & 1 \\ 1 & 0 \end{bmatrix}$
	c) $\begin{bmatrix} 7 & 1 \\ 1 & 0 \end{bmatrix}$	d) $\begin{bmatrix} 2 & 1 \\ 7 & 0 \end{bmatrix}$
20.	If $\vec{F} = ax\hat{\imath} - by\hat{\jmath} - cz\hat{k}$ where a, b, c are constants, is solenoidal then which of the following is false?	
	a) $a = b + c$	b) $\nabla \bullet \vec{F} = 0$
	c) $\nabla \bullet \vec{F} \neq 0$	d) $\nabla \bullet \vec{F}$ is a scalar quantity
21.	Which of the following statement is true? i) The divergence and curl of vector fields are scalar quantities. ii) The divergence and curl of vector fields are scalar and vector quantities respectively. iii) The divergence and curl of a vector fields are vector and scalar quantities respectively. iv) The divergence and curl of a vector fields are vector quantities.	
	a) i	b) ii
	c) iii	d) iv
22.	If $f(x,y,z) = x^2 - xy + yz^3 - 6z$ then $\nabla f(x,y,z)$ is	
	a) $(2x - y, -x + z^3, 3yz^2)$	b) $(2x - y, -x + z^3, 3yz^2 - 6)$
	c) $(2x - y, -x + z^3, yz^2)$	d) $(2x, -x - z^3, 3yz^2 - 6)$
23.	If $F(x,y,z) = (x^2 + y^2 + z^2 - 1, 2x^2 + 2y^2 - 1)$ then $F'(x,y,z)$ is	
	a) $\begin{pmatrix} 2x & 2y & 2z \\ 4x & 4y & 0 \end{pmatrix}$	b) $\begin{pmatrix} x & 2y & 2z \\ x & 4y & 0 \end{pmatrix}$
	c) $\begin{pmatrix} 2x & y & z \\ 4x & y & 0 \end{pmatrix}$	d) $\begin{pmatrix} x & 0 & z \\ 4x & y & 0 \end{pmatrix}$
24.	If $\vec{F} = 4ax\hat{\imath} + 8by\hat{\jmath}$ is solenoidal then which of the following is false?	
	a) $\nabla \bullet \vec{F} = 0$	b) $\nabla \bullet \vec{F}$ is a scalar quantity
	c) $a = 2b$	d) $a = -2b$
25.	If $\vec{F} = 3x\hat{\imath} + y^2\hat{\jmath} + xz\,\hat{k}$ then divergence of $\vec{F}$ at the point (1,2,3) is	
	a) 8	b) 10
	c) 6	d) 12
26.	If $\vec{r} = x\hat{\imath} + y\hat{\jmath} + z\hat{k}$ then $curl(\vec{r})$ is	
	a) 1	b) 3

	c) $\vec{0}$	d) $\hat{\imath}+\hat{\jmath}+\hat{k}$
27.	A vector field which has a vanishing curl is called:	
	a) an irrotational vector field	b) solenoidal vector field
	c) scalar field	d) none of these
28.	If $\varphi = xy^3z$ then $\nabla\varphi$ at (1,1,1) is	
	a) $\hat{\imath}+3\hat{\jmath}+\hat{k}$	b) $\hat{\imath}+3\hat{\jmath}+5\hat{k}$
	c) $\hat{\imath}+2\hat{\jmath}+\hat{k}$	d)) $2\hat{\imath}+2\hat{\jmath}+\hat{k}$
29.	If $\vec{r} = x\hat{\imath}+y\hat{\jmath}+z\hat{k}$ then $div(\vec{r})$ is	
	a) 1	b) 3
	c) $\hat{\imath}+\hat{\jmath}+\hat{k}$	d) 0
30.	If $f(x,y) = 5xy + 2x^2$ then Hessian of f is	
	a) $\begin{bmatrix}2 & 1\\1 & 0\end{bmatrix}$	b) $\begin{bmatrix}1 & 1\\1 & 0\end{bmatrix}$
	c) $\begin{bmatrix}4 & 5\\5 & 0\end{bmatrix}$	d) $\begin{bmatrix}4 & 1\\1 & 0\end{bmatrix}$
31.	If $\vec{F} = ax\hat{\imath} - by\hat{\jmath}$ is solenoidal then which of the following is true?	
	a) $a = b$	b) $\nabla \bullet \vec{F}$ is a vector quantity
	c) $a + b = 0$	d) $a^2 + b^2 = 0$
32	If $\vec{F} = 6\hat{\imath}+\hat{\jmath}+by\hat{k}$ is an irrotational vector, then	
	a) $b = 2$	b) $b = -1$
	c) $b = 0$	d) $b = 1$
33.	If $\varphi = 2x + 2y + 2z$ then $curl(grad\varphi)$ is	
	a) $\vec{0}$	b) $2\hat{\imath}+2\hat{\jmath}+2\hat{k}$
	c) $x\hat{\imath}+y\hat{\jmath}+z\hat{k}$	d) $\hat{\imath}+\hat{\jmath}+\hat{k}$
34.	If $\vec{F} = 2ax\hat{\imath} + 6by\hat{\jmath}$ is solenoidal then which of the following is false?	
	a) $a + 3b = 0$	b) $\nabla \bullet \vec{F} = 0$
	c) $\nabla \bullet \vec{F}$ is a scalar quantity	d) $\nabla \bullet \vec{F}$ is a vector quantity
35.	If $\vec{F} = bz\hat{\imath}+3\hat{\jmath}+4\hat{k}$ is an irrotational vector, then	
	a) $b = 0$	b) $b = 1$
	c) $b = 5$	d) $b = -1$
36.	If $\vec{F} = x\hat{\imath} - y\hat{\jmath} + z\hat{k}$ then divergence of $\vec{F}$ is	
	a) $\hat{\imath}-\hat{\jmath}+\hat{k}$	b) 1

	c) 0	d) $x\hat{i} - y\hat{j} + z\hat{k}$
37.	If $\varphi = x + y + z$ then $curl(grad\varphi)$ is	
	a) $x\hat{i} + y\hat{j} + z\hat{k}$	b) $\hat{i} + \hat{j} + \hat{k}$
	c) $\vec{0}$	d) $x + y + z$
38.	If $f(x, y) = 5xy - x^2$ then Hessian of f is	
	a) $\begin{bmatrix} 2 & 1 \\ 1 & 0 \end{bmatrix}$	b) $[-2\ 1\ 1\ 5\ ]\begin{bmatrix} -2 & 1 \\ 1 & 5 \end{bmatrix}$
	c$\begin{bmatrix} 5 & 1 \\ 1 & 9 \end{bmatrix}$	d) $\begin{bmatrix} -2 & 5 \\ 5 & 0 \end{bmatrix}$
39.	If $\vec{F} = 2x\hat{i} - 3y^2\hat{j} + 4z\hat{k}$ then divergence of $\vec{F}$ at (1,1,1) is:	
	a) 0	b) $2\hat{i} - 6y\hat{j} + 4\hat{k}$
	c) 1	d) $2\hat{i} + 6y\hat{j} + 4\hat{k}$
40.	If $\vec{F} = ax\hat{i} - by\hat{j} - cz\hat{k}$ where a, b, c are constants, is solenoidal then which of the following is true?	
	a) $a = b + c$	b) $a = -b - c$
	c) $ax = by + cz$	d) $-c = b + a$

CO- 4 – Ordinary and Partial Differential equations		
1.	If two roots of the auxiliary equation of a second order linear differential equation with constant coefficients are real and equal, then the complementary solution is of the form:	
	a) $y_c = Ae^{m_1x} + Be^{m_2x}$	b) $y_c = Ae^{mx} + Bxe^{mx}$
	c) $y_c = Ae^{mx} + Be^{mx}$	d) $y_c = Ae^{m} + Bxe^{m}$
2.	Which of the following function is not a solution of the differential equation $y'' + y = 0$?	
	a) $y = sin\,2x$	b) $y = 2sin\,x$
	c) $y = cos\,x$	d) $y = 15cos\,x$
3.	The partial differential equation of the expression $z = ax + by$, where a and b are arbitrary constants, is:	
	a) $z = px - qy$	b) $z = p + q$
	c) $z = pq$	d) $z = px + qy$
4.	Which of the following equation is a parabolic partial differential equation?	
	a) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$	b) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f(x, y)$
	c) $a^2\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial t}$	d) $\frac{\partial^2 u}{\partial x^2} = 4\frac{\partial^2 u}{\partial t^2}$

5.	Which of the following function is the solution of the differential equation $y' + 2y = 0$.	
	a) $y = e^{2x}$	b) $y = e^{x}$
	c) $y = e^{-x}$	d) $y = e^{-2x}$
6.	The order of a differential equation whose general solution is $y = A\sin x + B\cos x$ (where A, B are arbitrary constants) is:	
	a) 4	b) 1
	c) 3	d) 2
7.	The partial differential equation of the expression $2z = ax^2 + by^2$ where a and b are arbitrary constants, is:	
	a) $2z = px + qy$	b) $z = p + q$
	c) $z = py + qx$	d) $z = px - qy$
8.	The following second order partial differential equation is: $2x\frac{\partial^2 u}{\partial x^2} + 3x\frac{\partial^2 u}{\partial y^2} = \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y}$	
	a) parabolic	b) hyperbolic
	c) elliptic	d) circular
9.	The solution of differential equation $x\,dx + y\,dy = 0$ represents:	
	a) Hyperbola	b) Lines passing through the origin
	c) Parabola whose vortex is the origin	d) A circle with origin as center
10.	The complementary function of the differential equation $(D^2 + 3D - 4)y = x$ is:	
	a) $y_c = C_1e^{-2x} + C_2e^{2x}$	b) $y_c = C_1e^{x} + C_2e^{3x}$
	c) $y_c = C_1e^{x} + C_2e^{-4x}$	d) $y_c = C_1e^{-x} + C_2e^{4x}$
11.	The partial differential equation of the expression $z = f(x)$, where $f(x)$ is an arbitrary function, is:	
	a) $z = \frac{\partial z}{\partial x}$	b) $\frac{\partial z}{\partial y} = 0$
	c) $\frac{\partial z}{\partial x} + \frac{\partial z}{\partial x} = 0$	d) $z = \frac{\partial z}{\partial y}$
12.	The following second order partial differential equation is: $x\frac{\partial^2 u}{\partial x^2} - x^2\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$	
	a) parabolic	b) hyperbolic
	c) elliptic	d) circular
13.	The differential equation of the circles whose centers are origin is:	
	a) $x + \frac{dy}{dx} = 0$	b) $x + y\frac{dy}{dx} = 0$
	c) $x + \frac{dy}{dx} = a$	d) $x - y\frac{dy}{dx} = 0$

14.	If two roots of the auxiliary equation of a second order linear differential equation with constant coefficients are purely imaginary, then the complementary solution is of the form:	
	a) $y_c = A\cos\beta x + B\sin\beta x$	b) $y_c = A\cos\beta x$
	c) $y_c = A\sin\beta x$	d) $y_c = e^{\alpha x}(A\cos\beta + B\sin\beta)$
15.	The partial differential equation of the expression $z = f(x+y)$, where $f(x+y)$ is an arbitrary function, is:	
	a) $p - q = 0$	b) $p + q = 0$
	c) $z = p + q$	d) $z = p - q$
16.	The following second order partial differential equation is: $xy\,\frac{\partial^2 u}{\partial x\partial y} - x^2\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = \cos(2x+3y)$	
	a) parabolic	b) hyperbolic
	c) elliptic	d) circular
17.	The particular integral of the differential equation $(D^2-2)y = 2e^{2x}$ is:	
	a) $y_p = x^2e^{2x}$	b) $y_p = xe^{2x}$
	c) $y_p = e^{2x}$	d) $y_p = \frac{e^{2x}}{2}$
18.	The solution of the differential equation $2x\frac{dx}{dy} - y = 0$ represents:	
	a) parabola	b) circle
	c) ellipse	d) hyperbola
19.	The partial differential equation of the expression $z = ae^x - be^y$, where a and b are arbitrary constants, is:	
	a) $z = p + q$	b) $z = p - q$
	c) $p + q = 0$	d) $p - q = 0$
20.	Which of the following equation is a hyperbolic partial differential equation?	
	a) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$	b) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f(x,y)$
	c) $a^2\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial t}$	d) $\frac{\partial^2 u}{\partial x^2} = 4\frac{\partial^2 u}{\partial t^2}$
21.	Which of the following function is a solution of the differential equation $\left(\frac{dy}{dx}\right)^2 = 0$?	
	a) $y = e^x$	b) $y = x^2$
	c) $y = 25x$	d) $y = \cos\cos x$
22.	If two roots of the auxiliary equation of a second order linear differential equation with	

	constant coefficients are real and distinct, then the complementary solution is of the form:	
	a) $y_c = Ae^{m_1 x} + Be^{m_2 x}$	b) $y_c = Ae^{mx} + Bxe^{mx}$
	c) $y_c = Ae^{mx} + Be^{mx}$	d) $y_c = Ae^{m_1} + Bxe^{m_2}$
23.	The partial differential equation of the expression $z = ax + be^y$, where a and b are arbitrary constants, is:	
	a) $z = p + q$	b) $z = px + q$
	c) $z = p + qy$	d) $z = p - q$
24.	Which of the following partial differential equation is not an elliptic partial differential equation?	
	a) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$	b) $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f(x, y)$
	c) $a^2 \frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial t}$	d) $x^2 \frac{\partial^2 u}{\partial x^2} + 4y^2 \frac{\partial^2 u}{\partial t^2} = 4xy$
25.	The particular integral of the differential equation $(D^2 + 2)y = 2\cos x$ is:	
	a) $y_p = -2\cos x$	b) $y_p = 2\cos x$
	c) $y_p = 2\sin x$	d) $y_p = -2x \sin x$
26.	Which of the following equation is not a first order linear differential equation in y?	
	a) $\frac{dy}{dx} + x^2 y = x$	b) $\frac{dy}{dx} + yx = e^x$
	c) $\frac{dy}{dx} + x^2 y^2 = \tan x$	d) $\frac{dy}{dx} + yx = x^3$
27.	The partial differential equation of the expression $z = xe^a - by$, where a and b are arbitrary constants, is:	
	a) $z = px - qy$	b) $z = px + qy$
	c) $z = p + q$	d) $px + qy = 0$
28.	The following second order partial differential equation is: $y^2 \frac{\partial^2 u}{\partial x^2} - 2xy \frac{\partial^2 u}{\partial x \partial y} + x^2 \frac{\partial^2 u}{\partial y^2} - x^2 \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$	
	a) parabolic	b) hyperbolic
	c) elliptic	d) circular
29.	Which of the following function is not a solution of the differential equation $\frac{dy}{dx} = y$?	
	a) $y = 2e^x$	b) $y = e^{2x}$
	c) $y = 3e^x$	d) $y = e^x$

30.	If the roots of the auxiliary equation of a differential equation are $0,\ 1,\ \ 0$ then the differential equation is:	
	a) $(D^3 - D)y = 0$	b) $(D^3 - D^2)y = 0$
	c) $(D^3 - 1)y = 0$	d) $D^3 y = 0$
31.	The partial differential equation of the expression $z = e^y g(x)$, where $g(x)$ an arbitrary function, is:	
	a) $z = \frac{\partial z}{\partial y}$	b) $z = \frac{\partial z}{\partial x}$
	c) $\frac{\partial z}{\partial x} = 0$	d) $\frac{\partial z}{\partial y} = 0$
32.	Which of the following equation is not a hyperbolic partial differential equation?	
	a) $-2\frac{\partial^2 u}{\partial x^2} - x^2\frac{\partial^2 u}{\partial y^2} = 0$	b) $\frac{\partial^2 u}{\partial x^2} - \frac{\partial^2 u}{\partial y^2} = 0$
	c) $xy\frac{\partial^2 u}{\partial x^2} - 3xy\frac{\partial^2 u}{\partial y^2} = 0$	d) $\frac{\partial^2 u}{\partial x^2} - y^2\frac{\partial^2 u}{\partial y^2} = 0$
33.	The particular integral of the differential equation $(D^2 + 6)y = 2\,sin\,sin\,2x$ is:	
	a) $y_p = cos\,2x$	b) $y_p = 2xcos\,2x$
	c) $y_p = sin\,2x$	d) $y_p = -sin\,2x$
34.	If the roots of the auxiliary equation of a differential equation are $2i,\ -2i$ then the differential equation is :	
	a) $(D^2 - 4)y = 0$	b) $(D^2 + 4)y = 0$
	c) $(D^2 - 2)y = 0$	d) $(D^2 + 2)y = 0$
35.	The partial differential equation of the expression $2z = ax^2 + by$, where a and b are arbitrary constants, is:	
	a) $2z = px + 2qy$	b) $z = px + qy$
	c) $z = 2px + qy$	d) $z = px - qy$
36.	The following second order partial differential equation is: $$y^2\frac{\partial^2 u}{\partial x^2} - 4xy\frac{\partial^2 u}{\partial x \partial y} - 4x^2\frac{\partial^2 u}{\partial y^2} - xy = 0$$	
	a) parabolic	b) hyperbolic
	c) elliptic	d) circular
37.	Which of the following differential equation is first order linear differential equation in y?	
	a) $x^2y^2 + \frac{dy}{dx} = 0$	b) $x + y\frac{dy}{dx} = y^3$
	c) $x^4 + \frac{dy}{dx} = ay$	d) $x^2y - y\frac{dy}{dx} = sin\,sin\,y$

38.	The function $y = C_1e^{-2x} + C_2e^{3x}$ is the general solution of the equation:	
	a) $(D^2 + D - 6)y = 0$	b) $(D^2 - D + 6)y = 0$
	c) $(D^2 + D + 6)y = 0$	d) $(D^2 - D - 6)y = 0$
39.	The partial differential equation of the expression $z = ay + bx$, where a and b are arbitrary constants, is:	
	a) $z = px + qy$	b) $z = qx + py$
	c) $z = p + q$	d) $z = px - qy$
40.	Which of the following partial differential equation is an elliptic partial differential equation?	
	a) $-2\frac{\partial^2 u}{\partial x^2} - x^2\frac{\partial^2 u}{\partial y^2} = 0$	b) $\frac{\partial^2 u}{\partial x^2} - \frac{\partial^2 u}{\partial y^2} = 0$
	c) $xy\frac{\partial^2 u}{\partial x^2} - 3xy\frac{\partial^2 u}{\partial y^2} = 0$	d) $\frac{\partial^2 u}{\partial x^2} - y^2\frac{\partial^2 u}{\partial y^2} = 0$