Mathematics Paper I(Calculus – I) – FYBSc - Sem I			
1.	The existence of additive identity in $\mathbb{R}$ is expressed using the equation		
	(a)	$x * 1 = x\ , \forall x \in \mathbb{R}$	
	(b)	$x * 0 = 0\ , \forall x \in \mathbb{R}$	
	(c)	$x * \frac{1}{x} = 1\ , \forall x \in \mathbb{R}$	
	(d)	$x + 0 = 0 + x = x\ , \forall x \in \mathbb{R}$	
			Marks:

2.	For $p, q \in \mathbb{R}, p * q = 0$ implies		
	(a)	Both $p = 0, q = 0$	
	(b)	$p = 0\ or\ q = 0$	
	(c)	$p - q = 0$	
	(d)	None of the above	
			Marks:

3.	If $\inf A = \sup A$, then the set A _____		
	(a)	Contains only one element	
	(b)	Contains 2 elements	
	(c)	Is an empty set	
	(d)	None of the above	
			Marks: 1

4	Which of the following sequence is divergent?		
	(a)	$5^{1/n}$	
	(b)	$n^{1/n}$	
	(c)	$n^{1/2}$	
	(d)	None of the above	
			Marks: 1

5	If $(x_n)\ and\ (y_n)$ are convergent sequences then which of the following statements is not true?	
	(a)	$(x_n + y_n)$ is convergent
	(b)	$(x_n - y_n)$ is convergent
	(c)	$(c\ x_n)$ is convergent $\forall n \in \mathbb{N}$

	(d)	None of the above
		Marks : 2

6	Let (x_n) be a sequence that is monotonic decreasing which is not bounded below then (x_n)	
	(a)	Is divergent
	(b)	Is convergent
	(c)	Is bounded
	(d)	None of the above
		Marks : 2

7	$y^2 = cx^2$ is the general solution of which of the following first order ODE?	
	(a)	$\frac{dy}{dx} = -\frac{y}{x}$
	(b)	$\frac{dy}{dx} = \frac{x}{y}$
	(c)	$\frac{dy}{dx} = \frac{y}{x}$
	(d)	$\frac{dy}{dx} = -\frac{x}{y}$
		Marks : 2

8	The degree of the ordinary differential equation $\left(\frac{d^2y}{dx^2}\right)^3 - 5\left(\frac{dy}{dx}\right)^4 + 2y = x^6$	
	(a)	4
	(b)	3
	(c)	2
	(d)	1
		Marks : 2

9	The equation of the orthogonal trajectories to the family of straight lines $y = -x + c, c > 0$ are	
	(a)	$y = x + k$
	(b)	$y = -2x + k$
	(c)	$2y = x + k$
	(d)	$y = 3x + k$
		Marks : 2

10	A necessary and sufficient condition for a first order O.D.E.

	$M(x,y)dx + N(x,y)dy = 0$ to be EXACT is		
	(a)	$\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$	
	(b)	$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$	
	(c)	$\frac{\partial M}{\partial x} \neq \frac{\partial N}{\partial y}$	
	(d)	$\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$	
			Marks : 2