Seat No.:	

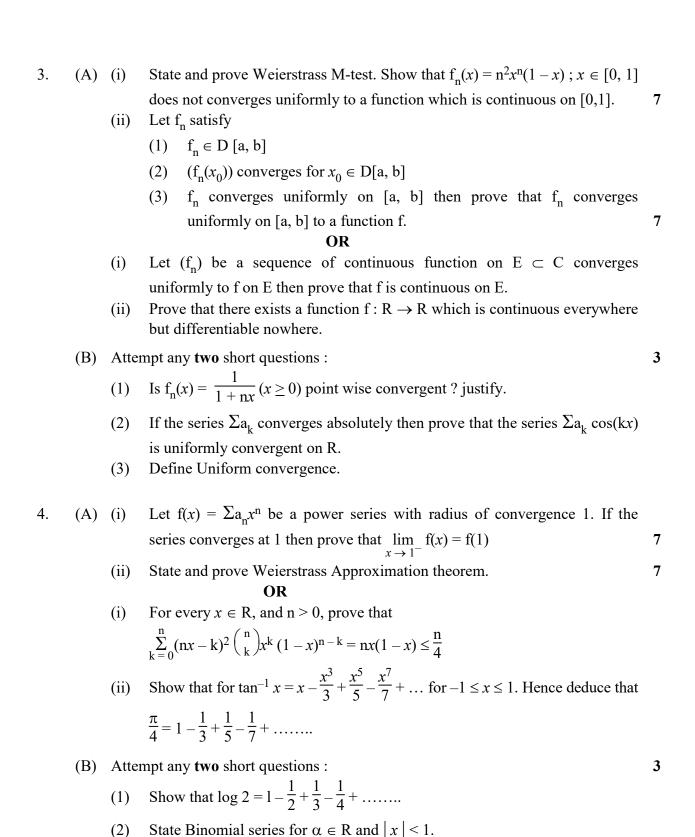
MO-128

March-2019

B.Sc., Sem.-VI

CC-309: Mathematics

Tim	e : 2:3	80 Ho	rs] [Max. Mark	s:70
Instructions:		ns:	 All questions are compulsory. Right hand side figure indicates marks of that question. 	
1.	(A)	(i)	Let X be a metric space. Prove that A subset G of X is open if and only if is a union of open spheres.	it 7
		(ii)	Prove that in any metric space X, each open sphere is an open set. OR	7
		(i)	Define close set. Let X be a metric space. A subset F of X is closed if ar only if its complement F' is open.	nd
		(ii)	Let X be a complete metric space and let Y be a subspace of X. Prove th Y is complete if and only if it is closed.	at
	(B)	Atte	apt any two short questions:	4
		(1)	Is the real function $ x $ defined on real line R is metric? Justify.	
		(2)	Define metric space.	
		(3)	Define interior of A. Give any two basic properties of Int(A).	
2.	(A)	(i)	Prove that closed subset of a compact sets are compact.	7
		(ii)	Prove that a compact subset of a metric space are closed.	7
			OR	
		(i)	A subset E of a real line R^1 is connected if and only if it has following property: "If $x \in E$, $y \in E$ and $x < z < y$ then $Z_0 \in E$ ".	ng
		(ii)	A mapping f of a metric space X into a metric space Y is continuous on X and only if $f^{-1}(V)$ is open in X for every open set V in Y.	if
	(B)	Atte	apt any two short questions:	4
		(1)	Define compact metric space.	
		(2)	Define complete metric space.	
		(3)	Define bounded mapping.	
	400			



MO-128 2

Define Taylor's series.

(3)