	FYBSc **Mathematics Paper II: MTH-112** **Subject: Calculus** **Question Bank**	**ANS**
1	If functions f(x) and g(x) are continuous everywhere and f(1) = 2, f(3) = -4, f(4) = 8, g(0) = 4, g(3) = -6 and g(7) = 0 then lim (f + g)(x) as x approaches 3 is equal to A. -10 B. -11 C. -15 D. cannot find a value for the above limit since only values of the functions are given.	**A**
2	**If f (9) = 9, f'(9) = 4, then** $\lim_{x \to 9} \frac{\sqrt{f(x)} - 3}{\sqrt{x} - 3}$ **equals** A. 0 B. 9 C. 4 D. None of these	**C**
3	If f(x) is continuous everywhere, A. Then |f(x)| is continous everywhere. B. Then |f(x)| is discontinous everywhere. C. Then |f(x)| is discontinous somewhere. D. None of these	**A**
4	If f(x) is continuous everywhere, then square root [f(x)] is continuous everywhere. A. The statement is true. B. The statement is false. C. Can't say D. None of these	**B**
5	If the composition f o g is not continuous at x = a, this implies A. then either g is not continuous at x = a or f is not continuous at g(a). B. then either g is continuous at x = a or f is not continuous at g(a). C. then either g is not continuous at x = a or f is continuous at g(a). D. then either g is continuous at x = a or f is continuous at g(a).	**A**
6	Evaluate the following limit: $\lim_{x \to 1} \frac{x^2 - 1}{x^2 + 3x - 4}$ A. 2/5 B. infinity C. 0 D. 5/2	**A**

7	The interval in which the Lagrange's theorem is applicable for the function f(x) = 1/x is A. [-3, 3] B. [-2, 2] C. [2, 3] D. [-1, 1]	**C**
8	If f(x) = | x | , then for interval [-1, 1] ,f(x) A. satisfied all the conditions of Rolle's Theorem B. satisfied all the conditions of Mean Value Theorem C. does not satisfied the -conditions of Mean Value Theorem D. None of these	**C**
9	What is the derivative of f(x) = | x | at x = 0 A. Does not exist B. 1 C. -1 D. 0	**A**
10	$\lim\limits_{x \to 0} \frac{\sin^2 x}{x}$ is equal to A. 0 B. ∞ C. 1 D. -1	**A**
11	True or False .The following series of Sin x is $x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots\ldots$ A)True B)False	**A**
12	Expansion of function f(x) is? A. $f(0) + \frac{x}{1!} f'(0) + \frac{x^2}{2!} f''(0) \ldots\ldots + \frac{x^n}{n!} f^n(0) + \ldots$ B. $1 + \frac{x}{1!} f'(0) + \frac{x^2}{2!} f''(0) \ldots\ldots + \frac{x^n}{n!} f^n(0)$ C. $f(0) - \frac{x}{1!} f'(0) + \frac{x^2}{2!} f''(0) \ldots\ldots + (-1)^n \frac{x^n}{n!} f^n(0)$ D. $f(1) + \frac{x}{1!} f'(1) + \frac{x^2}{2!} f''(1) \ldots\ldots + \frac{x^n}{n!} f^n(1)$	**A**
13	The necessary condition for the maclaurin expansion to be true for function f(x) is ___________ A. f(x) should be continuous B. f(x) should be differentiable C. f(x) should exists at every point D. f(x) should be continuous and differentiable	**D**
14	The expansion of f(a+h) is _______ A. $f(a) + h/1!\, f'(a) + h^2/2!\, f''(a) \ldots\ldots + h^n/n!\, f^{(n)}(a) + \ldots$ B. $f(a) + h/1!\, f'(a) + h^2/2!\, f''(a) \ldots\ldots$	**A**

	C. $hf(a)+ \frac{h^2}{1!}f'(a)+ \frac{h^3}{2!}f''(a)\ldots\ldots.+ \frac{h^n}{n!}f^n(a)$ D. $hf(a)+ \frac{h^2}{1!}f'(a)+ \frac{h^3}{2!}f''(a)\ldots\ldots\ldots$	
15	True or False .The following series of Cosx is $1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+\ldots\ldots.$ A)True B)False	**A**
16	True or False .The following series of Cos x is $x-\frac{x^3}{3!}+\frac{x^5}{5!}-\frac{x^7}{7!}+\ldots\ldots.$ A)True B)False	**B**
17	Find the expansion of $\frac{1}{1-x}$ $provided\ |x| < 1.$ A. $1+x^2-x^4/3+x^6/120-\ldots$ B. $1+x+x^2+x^3+\ldots$ C. $x+x^3/3+x^5/120+..$ D. $x+x^3/3-x^5/120+\ldots$	**B**
18	Find the expansion of $\frac{1}{1+x}$ $provided\ |x| < 1.$ A. $1+x^2-x^4/3+x^6/120-\ldots$ B. $1-x+x^{2-}x^3+\ldots$ C. $x+x^3/3+x^5/120+..$ D. $x+x^3/3-x^5/120+\ldots$	**B**
19	True or False $e^x = 1 + x + \frac{x^2}{2!}+\ldots+\ldots$ A)True B)False	**A**
20	True or False.. $sinx\ = 1 + x + \frac{x^2}{2!}+\ldots+\ldots$ A)True B)False	**B**
21	True or False . $log(1 + x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \cdots$ .... A)True B)False	**A**
22	True or False . $log(1 - x) = -x - \frac{x^2}{2} - \frac{x^3}{3} - \cdots$ .... A)True B)False	**A**
23	True or False .The following series of e^x is $1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+\ldots\ldots.$ A)True B)False	**B**
24	True or False .The following series of Sin x is $1-\frac{x^2}{2!}+\frac{x^4}{4!}-\frac{x^6}{6!}+\ldots\ldots.$ A)True B)False	**B**
25	True or False $e^{-x} = 1 - x + \frac{x^2}{2!}-\ldots+\ldots$ A)True B)False	**A**
26	True or False $e^x = 1 + x + x^2+\ldots+\ldots$ A)True B)False	**B**
27	Find $\int_0^{\frac{\pi}{2}} sin^5x\ dx\ =?$ A)$\frac{8}{15}$ B))π C) 1	**A**

	D) $\frac{2}{3}$	
28	Find $\int_0^{\frac{\pi}{2}} cos^2x\ dx = ?$ A) $\frac{\pi}{2}$ B)π C) 1 D) 0	**A**
29	Find $\int_0^{\frac{\pi}{2}} cos^3x\ dx = ?$ A) $\frac{\pi}{2}$ B)π C) 1 D) $\frac{2}{3}$	**D**
30	Find $\int_0^{\frac{\pi}{2}} sin^3x\ dx = ?$ A) $\frac{\pi}{2}$ B)π C) 1 D) $\frac{2}{3}$	**D**
31	Evaluate: $\lim_{x\to 1} \frac{x^2-1}{x^2+3x-4}$ A. 1/5 B. 2/5 C. 3/5 D. 4/5	**B**
32	Evaluate: $\lim_{x\to 4} \frac{x-4}{x^2-x-12}$ A. undefined B. 0 C. Infinity D. 1/7	**D**
33	Evaluate: $\lim_{x\to 4} \frac{x^2-16}{x-4}$ A. 0 B. 1 C. 8 D. 16	**C**
34	Evaluate: $M = \lim_{x\to 2} \frac{x^2-4}{x-2}$ A. 0 B. 2	**C**

	C. 4 D. 6	
35	If f and g are two functions such that lim f(x) as x --> a = + infinity and lim g(x) as x --> a = + infinity then lim [f(x) - g(x)] as x --> a A. Zero B. Infinity C. One D.Not defined	**D**
36	If lim f(x) and lim g(x) exist as x approaches a then lim [f(x) / g(x)] = lim f(x) / lim g(x) as x approaches a. A. True B. False C. Only if lim g(x) is not equal to 0 D.Only if lim f(x) is not equal to 0.	**C**
37	For any polynomial function p(x), lim p(x) as x approaches a is equal to …… A. p(a) B. 1 C. 0 D.Not defined	**A**
38	Evaluate: $\lim_{x \to 0} \frac{1-\cos x}{x^2}$ A. 0 B. 1/2 C. 2 D. -1/2	**B**
39	If lim f(x) = L1 as x approaches a from the left and lim f(x) = L2 as x approaches a from the right. lim f(x) as x approaches a exists only if L1 = L2. A. True B. False C. Can't say D.Invalid	**A**
40	The two functions f and g defined by f(x) = 3x + 3 for x real and g(t) = 3t + 3 for t real and positive…. A. Are equal B. Two functions are equal if their rules are equal and their domains are the same. C. Two functions are equal if their rules are equal and their domains are the diferent. D.None of these	**B**
41	If functions f and g have domains Df and Dg respectively, then the domain of f / g is given by A. the union of Df and Dg B. the intersection of Df and Dg C. the intersection of Df and Dg without the zeros of function g	**C**

	D.None of the above	
42	Evaluate: $\lim_{x \to 4} x^2 + 3x - 4$ A. 24 B. 26 C. 28 D. 30	**A**
43	If f is a function such that lim f(x) as x --> a does not exist then f is A. Continuous B. Not Continuous C. Neither A nor B D.Both A and B	**B**
44	If functions f(x) and g(x) are continuous everywhere then A. (f / g)(x) is also continuous everywhere. B. (f / g)(x) is also continuous everywhere except at the zeros of g(x). C. more information is needed to answer this question D. None of these	**B**
45	Find $\int_0^{\frac{\pi}{2}} sin^2x\ dx = ?$ A) $\frac{\pi}{2}$ B)π C) 1 D) 0	**A**