LINCOLN UNIVERSITY COLLEGE

Texas College of Mgmt & IT

Mitrapark, Chabahil, Ktm

Department of BIT & BCS

Pre Board Test-2074

Program: BIT	**FM : 100**
Subject: MATH Code: BIT 116	**PM : 50**
Level: BIT 1st Semester (1ST Year) SET 'A'	**Time: 3 hrs.**

Attempt All Questions (Group A)

MCQ (1x30=30)

1)The integral value of the function $4x^2-3x+2$ is

a. 4x-3 b. $4x^2 - x + 2$

c. $x^4 - x^2 + 2x$ d. $x^4 - 2x$

2)The P-series is convergent it

a. $P > 1$ b. $P = 1$ c. $P = 0$

d. $P \leq 1$

3) The domain of the function $y = \sqrt{x}$ is :

a)$(0, \infty)$ b) $[0, \infty)$ c) $(-1, \infty)$ d) $[1, \infty)$

4) Which of the following statement is tautology:

a)[p^ (p => q)] => q b) ~p^ q c) p_v~ q d)~ [p_vq]

5) The value of $\lim_{x\to 3} \frac{5x^2-8x-13}{x^2-5}$ is :

a)1 b) -1 c) 2 d) -2

6) The area between the region $y = x^2$ and $y = \sqrt{x}$ is

a. 3 b. -4 c. 1/2 d. 1/3

7) The value of $\lim_{x\to\infty} \frac{2x+7}{3x^2-5}$ is :

a) 1 b)2 c) -1 d) 0

8) The derivative of the function $y = 5x^2 - 3x + 7$ is:

a) $5x - 3x + 7$ b) $10x - 3$ c) $10x^2 - 3x + 7$ d) $5x^2 - 3$

9) Which of the following is not true:

a) $|x| \geq 0$ b) $|x| = |-x|$ c) $|x|^2 = x^2$ d) None

10) If $-3 < x < 7$, then:

a)$|x-2| < 5$ b) $|x| < 7$ c) $|x+3| < 7$ d) $|x+1| < 4$

11) Let A = [-3, 2) and B = [-2, 3) Then the value of A-B is :

a) (2, 3) b) [-3, -2) c) (-3, 2) d) [-3 ,-2]

12) If (x+3 , 3) = (2 , y+7x) then the value of x is :

a) -1 b) 0 c) 2 d) -2

13) A function f : R→R be given by $f(x) = x^2$ is :

a) one to one b) onto c) both d)none

14) If A = { a , b , c , d } and B = { x , y , z , 4} then which of the following is not a function:

a) {(a , x) , (b , y),(c , z) , (d , 4)} b) {(a , x) , (b , y), (c , 4)}(

c) {(a , z) , (b , x) , (c , z) , (d , x)} d) {(a, 4) , (b , 4) , (c , 4) , (d , 4)}

15) which of the following is an exponential function

a) $y = x^2 - 2$ b) $y = 2^x$ c) y = logx d) $y = \frac{x^2}{2}$

16) Which is not true:

a) log(xy) =logx.logy b) log(xy) = logx + logy

c) log x^m =mlogx d)all

17) The value of x if $\log_3 x = 3$, is:

a) 9 b) 18 c) 21 d) 27

18) Which of these is not an indeterminate form :

a) $\infty.0$ b) $\infty - \infty$ c) 0. 0 d) $\frac{0}{0}$

19) Which of the following is true:

a)$\lim_{x\to p} c = c$ b) $\lim_{x\to p} c = p$

c)$\lim_{x\to p} c = x$ d) none

20) If $f(x) = x^2 - 5x + 1$, then f(-1) is:

a) 7 b)-3 c)0 d)-5

21) The derivative of log 2x is:

a) $\frac{1}{x}$ b)$\frac{1}{2x}$ c) 2x d) $\frac{1}{2}$

22) The derivative of e^{2x} is:

a) e^{2x} b) 2x c) $2e^{2x}$ d) e^x

23) If $f(x) = x^{-3}$, then f' (x) is:

a) $-3x^{-4}$ b) x^{-3} c) $-3x^{-2}$ d)$-x^{-4}$

24) If $f(x) = x^3 + 2x$, then f''(x) is :

a)$3x^2$ b) $3x^2+2$ c)6x d)6

25) Which of the following is not the rational number :

a) $\sqrt{2}$ b) -2 c)0 d) $\frac{1}{5}$

26) A function is even function if,

a. f(-x) =-f(x) b. f(-x) =f(x) c. f(-x) =-f(-x)

d.- f(-x) = f(x)

27) Which of the following is not the irrational number:

a)π b)$\sqrt{3}$ c) 16 d)$\sqrt{14}$

28) If ydx + xdy = 0, then which of the following is true

a. x+ y = c b. xy = c c. x-y=c

b. d. xy = x+y +c

29)The integral value of $\int_1^4 x^2\,dx$ is

a. 12 b.14 c.21 d.30

30.) If (x+5 , 3) = (2 , y+4x) then the value of x is :

a) -1 b) 0 c) 2 d) none

THE END

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c) {(a , z) , (b , x) , (c , z) , (d , x)}

d) {(a, 4) , (b , 4) , (c , 4) , (d , 4)}

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29)The integral value of $\int_1^4 x^2\,dx$ is

b. 12 b.14 c.21 d.30

30.) If (x+5 , 3) = (2 , y+4x) then the value of x is :

a) -1 b) 0 c) 2 d) none

THE END

BIT – MATH

SET "A"

GROUP 'B'

Long Questions

Attempt any Two Questions **(2 × 20 =40)**

1. Suppose that a ball is dropped from the upper observation deck of the CN tower, 450 m above the ground.

   a. What is the velocity of the ball after 5 seconds?

   b. How fast is the ball travelling when it hits the ground?

2.a.Solve: $dy/dx+1/y = y^2$

b. Solve: $2xydx = y^2 + x^2$

3. Suppose that $\sum$ an and $\sum$ bn are two series with positive terms.

   If $\sum$bn is convergent and an≤ bn, then $\sum$an is also convergent.

   If $\sum$ bn is divergent and an≥ bn, them$\sum$ an is also divergent.

GROUP 'C'

Long Questions

Attempt any six Questions **(6×5=30)**

4. Show that the function $f(x) = |x – 6|$ is not differentiable at 6. Find a formula for f ' and sketch its graps.
5. Determine whether each of the following functions is even, odd or neither even nor odd (a) $f(x) = x^4 + \cos x$
(b) $f(x) = x^5 + \sin x$ (c) $f(x) = x + x^2$
6.The arc of the parabola $y = x^2$ from (1, 1) to (2, 4) is rotated about the y-axis. Find the area of the resulting surface
7. Find the volume of the solid obtained by rotating about the y-axis the region between $y = x$ and $y = x^2$.
8. Find the length of the arc of the semi-cubical parabola $y^2 = x^3$ between the points (1, 1) and (4, 8).
9.Let $f : \mathbb{Z}^+ \rightarrow \mathbb{Z}^+$ be defined by $f(x) = x^2 + 2$. Show that f is one to one. Is the function onto?
10. Verify the intermediate value theorem for $f(x) = 2x + 1$ in [2, 3]
11. The p-series $\sum_{n=1} n^p$ converges if $p > 1$ and diverges if $p \leq 1$.

THE END

MATH – BCA

SET "B"

GROUP 'B'

Long Questions **(2 × 20 =40)**

Attempt Two Questions:

1. Suppose that ∑ an and ∑ bn are two series with positive terms.

   If ∑bn is convergent and an≤ bn, then ∑an is also convergent.

   If ∑ bn is divergent and an≥ bn, them∑ an is also divergent.

2.Suppose that a ball is dropped from the upper observation deck of the CN tower, 450 m above the ground.

   What is the velocity of the ball after 5 seconds?

   How fast is the ball travelling when it hits the ground?

3. a.Solve: $dy/dx+1/y = y^2$
   b. Solve: $2xydx = y^2 + x^2$

GROUP 'C'

Short Question **(6 × 5 =30)**

Attempt Six Questions:

4. The p-series $_{n=1}\sum_{np}$ converges if p >1 and diverges if p ≤ 1.
5. Verify the intermediate value theorem for f(x) = 2x + 1 in [2, 3]
6. Let f : $\mathbb{Z}^+ \rightarrow \mathbb{Z}^+$ be defined by $f(x) = x^2 + 2$. Show that f is one to one. Is the function onto?
7. Show that the function f(x) = |x – 6| is not differentiable at 6. Find a formula for f ' and sketch its grap5.
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