Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF IT & COMPUTER SCIENCE

BCA Winter 2017 – 18 Examination

Semester: 1 **Date: 01/01/2018**
Subject Code: 05101130 **Time: 10:30 am To 1:00 pm**
Subject Name: Elementary Mathematics **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Answer the followings.

A. Fill in the blanks **(05)**

1. $\sin^2\theta + \cos^2\theta =$ _____.

2. If A (2,-7) and B (8, 3) are the given points, then the midpoint of AB is _____.

3. Define: Function

4. $\lim_{x\to\infty}\frac{1}{x} =$ _____

5. Define: Derivative

B. Multiple choice type questions/ Give the sentence true or false. (Each of 01 marks) **(10)**

1. $\lim_{x\longrightarrow 2} x^2 =$ _____

(a) 2 (b) 4 (c) 0 (d) 1

2. $\int 1dx =$ _____ $+c$

(a) x (b) $\frac{x^2}{2}$ (c) 0 (d) 1

3. Let $y = x$ then the value of y at $x = 2$ is _____

(a) 1 (b) 2 (c) 0 (d) 5

4. $\frac{d(u+v)}{dx}$

(a) $u\frac{du}{dx} - v\frac{dv}{dx}$ (b) $\frac{du}{dx} - \frac{dv}{dx}$ (c) $v\frac{du}{dx} + u\frac{dv}{dx}$ (d) $\frac{du}{dx} + \frac{dv}{dx}$

5. $\lim_{x\to a}\left(\frac{x^n - a^n}{x-a}\right)$

(a) na^{n-1} (b) na^{n+1} (c) na^n (d) na

6. Integration is reverse process of differentiation. **T/F**

7. $\frac{d}{dx}(x^n) = nx^{n+1}$ **T/F**

8. $\sin 0^\circ + \cos 0^\circ = 2$ **T/F**

9. $\int uvdx = u\int vdx - \int\left(u'\int vdx\right)dx$ **T/F**

10. $\frac{d(c)}{dx} = 0$ **T/F**

Q.2 Answer the followings (Any five) **(15)**

1. Prove that $\sin 30^\circ \cos ec30^\circ + \sin 45^\circ \cos ec45^\circ = 2$

2. If $f(x) = ax + \frac{1}{x}$ and $f\left(\frac{1}{5}\right) = \frac{28}{5}$ then find a.

3. Evaluate: $\lim_{x\to 1}\dfrac{x^2-4x+3}{x^2+2x-3}$

4. Find the equation of line passing through the points (1,2) and (3,4).

5. If $y = x * \log x$ then find $\dfrac{dy}{dx}$

6. Evaluate: $\int (x^3+4e^x+1)dx$

Q.3 Answer the following. (Any three) **(15)**

1. Evaluate: $\lim_{x\longrightarrow a}\dfrac{\sqrt{2a-x}-\sqrt{x}}{a-x}$

2. If $y=\dfrac{2x-3}{3x-2}$ then find $\dfrac{dy}{dx}$

3. Solve : $\int \frac{x^2+8x+15}{x+3}\,dx$

4. Prove that $1+\dfrac{\tan^2\theta}{\sec\theta+1}=\sec\theta$

Q.4 Answer the following.

A. Find the equation of line passing through the points (1, 5) & (3, -2). Also find the slope of the line. **(05)**

B. **1.** If the points (5, 7) and (-3, m), distance between the point is 10 unit then find the value of m. **(10)**

2. Prove that $4(sin^4 30° + cos^4 60°) - 3(cos^2 45° - sin^2 90°) - 2 = 0$

OR

B. **1.** Prove that : $\dfrac{sin\,\theta}{1-cos\theta} = \dfrac{1+cos\theta}{sin\theta}$ **(10)**

2. If $f(x)=\log\left(\dfrac{1-x}{1+x}\right)$ then prove that $f\left(\dfrac{2x}{1+x^2}\right)=2f(x)$