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.

Answer the followings. **Q.1**

- 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

$$\lim_{x \to 2} x^2 =$$

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

- **2.** $\int 1 dx = \underline{\hspace{1cm}} + c$
- (b) $\frac{x^2}{2}$
- (c) 0
- 3. Let y = x then the value of y at x = 2 is _____
- (a) 1 (b) 2
- (c) 0

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

- (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) $\frac{du}{dx} + \frac{dv}{dx}$

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

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

10.
$$\frac{d(c)}{dx} = 0$$

T/F

Q.2 Answer the followings (Any five)

(15)

- **1.** Prove that $\sin 30^{\circ} \cos ec 30^{\circ} + \sin 45^{\circ} \cos ec 45^{\circ} = 2$
- 2. If $f(x) = ax + \frac{1}{x}$ and $f\left(\frac{1}{5}\right) = \frac{28}{5}$ then find a.

- 3. Evaluate: $\lim_{x \to 1} \frac{x^2 4x + 3}{x^2 + 2x 3}$
- **4.** Find the equation of line passing through the points (1,2) and (3,4).

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

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

Q.3 Answer the following. (Any three)

Answer the following. (Any three)

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

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

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

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

Q.4 Answer the following

- Find the equation of line passing through the points (1, 5) & (3, -2). Also find the slope (05)A. of the line.
- 1. If the points (5, 7) and (-3, m), distance between the point is 10 unit then find the (10)В. value of m.
 - 2. Prove that $4(\sin^4 30^\circ + \cos^4 60^\circ) 3(\cos^2 45^\circ \sin^2 90^\circ) 2 = 0$

OR

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

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