

PARUL UNIVERSITY
FACULTY OF MANAGEMENT
BBA Summer 2022-23 Examination

Semester: 2
Subject Code: 06101155
Subject Name: BUSINESS MATHS - II

Date: 19/05/2023
Time: 10.30am to 1.00pm
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 Do as Directed.**A Multiple choice type questions****(05)**

1. In which type of Annuity payments are made at beginning of specified period?

a) Annuity Due	c) Ordinary Annuity
b) Perceptual Annuity	d) None of these
2. S.I. = $\frac{PRN}{100}$, N belongs to

a) Interest	c) Rate of Interest
b) Time period	d) None of these
3. $\lim_{x \rightarrow a} \left(\frac{x^n - a^n}{x - a} \right)$

a) na^{n-1}	c) na^{n+1}
b) na^n	d) na
4. $\frac{d(u+v)}{dx}$

a) $u \frac{du}{dx} - v \frac{dv}{dx}$	c) $\frac{du}{dx} - \frac{dv}{dx}$
b) $v \frac{du}{dx} + u \frac{dv}{dx}$	d) $\frac{du}{dx} + \frac{dv}{dx}$
5. If R is the revenue, then Marginal revenue M.R is

a) $\frac{dR}{dx}$	c) $\frac{dM}{dx}$
b) $\frac{dP}{dx}$	d) $\frac{dC}{dx}$

B). Define the following. (Each of 1 mark)**(05)**

1. Annuity
2. Continuity
3. Total Revenue function
4. Profit function
5. Derivative of a function

C). Direct questions. (Each of 1 mark)**(05)**

1. Write the formula for Compound interest.
2. $\lim_{x \rightarrow \infty} \left(\frac{1}{x} \right) = \underline{\hspace{2cm}}$
3. Find the derivative of $y = 2x + x^2$
4. $\int 0dx = \underline{\hspace{2cm}} + c$
5. $\int uvdx = \underline{\hspace{2cm}}$

Q.2 Answer the following questions.

- A).** 1. If $y = \frac{x}{\log x + 1}$, then find $\frac{dy}{dx}$. (04+03)
2. Find the derivative of $xe^x + x^{\frac{3}{2}}$
- B).** 1. If $x = at^2$ and $y = 2at$, then find $\frac{dy}{dx}$. (04+04)
2. If $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, then find $\frac{dy}{dx}$

Q.3 Answer the following questions.

- A).** 1. Show that the function $f(x) = \begin{cases} x^3 + 3, & \text{if } x \neq 0 \\ 1, & \text{if } x = 0 \end{cases}$ is not continuous. (04+03)
2. Find the equations of the tangent to the curve $y = x^3 - x$ at $(0, 1)$.
- B).** 1. If the cost function is $C = x^3 + 5x^2 + 2x + 100$, find the marginal cost function and average cost function. (04+04)
2. The demand function of a commodity is $x = \frac{100 - p}{2}$, find the marginal revenue when the demand is 15 units.

Q.4 Attempt any two questions. (Each of 7.5 mark)

15

- A)** Evaluate $\int \frac{x}{(x-1)(x-2)} dx$ using partial fractions.
- B)** Evaluate $\int x^2 e^x dx$ using integration by parts.
- C)** If the demand function is $p = \frac{7500 - x^2}{100}$, find the maximum revenue and also find the price for maximum revenue.
- D)** If $y = x^2 \log\left(\frac{1}{x}\right)$, prove that $x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + 2x^2 = 0$.