

Vidya Vikas Mandal's

Std : XII Ramacrisna Madeva Salgaocar Higher Secondary School Dur: 1 hr

Date : 26/07/2025

Margao – Goa

Marks : 20

First Formative Exam

Subject : MATHEMATICS AND STATISTICS

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1. The question paper consists of 8 questions.
 2. Question Numbers 1-2 are multiple choice /VSA type questions of 1 mark each.
 3. Question Numbers 3-4 are short answer type -I questions of 2 mark each.
 4. Question Numbers 5-6 are short answer type -II questions of 3 mark each.
 5. Question Numbers 7-8 are long answer type -1 questions of 4 mark each.
 6. There is no overall choice in the paper. However internal choice is provided in 1 question of 4 marks .
 7. Use of calculators is not permitted.

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1. In a bill of exchange after date , the term is counted from - - - - .
(A) Date of acceptance
(B) Date of drawn
(C) Date of maturity
(D) Date of discounting
 2. If $y = \cos^2(x^2)$. Find $\frac{dy}{dx}$.
 3. If $x = \log t$, $y = t^2$. Find $\frac{d^2y}{dx^2}$.
 4. Consider the relation R on N ,the set of natural numbers defined by
 $R = \{ (x,y) : x+y \text{ is even , } x \in N , y \in N \}$.
Check whether the relation is reflexive and symmetric
 5. If $y = (\tan x)^{\sec x} + e^{\sin x}$. Find $\frac{dy}{dx}$.
 6. Let $f: R \rightarrow R$ be defined by $f(x) = 3x-4$. Show that f is bijective.

7. Discuss the continuity of the following function at $x = 0$

$$\begin{aligned} \text{If } f(x) &= \frac{2\sin x - \sin 2x}{x^3} & x > 0 \\ &= 5x - 1 & x = 0 \\ &= \frac{e^{3x} - e^x}{x} & x < 0 \end{aligned}$$

State the type of discontinuity in case the function is discontinuous.

8. A banker discounts a bill for a certain amount which has 4 months to run before it matures legally at 8% p.a. If the discounted value of the bill is Rs 2,33,600. Find the face value of the bill and Banker's Discount?

OR

The banker's discount and true discount on a bill due 6 months hence are Rs 1020 and 1000 respectively. Find rate percent and amount of the bill.
