1. All questions are compulsory.
2. The question paper consists of 8 questions divided into
     four sections A, B,C and D.
3. Section A contains 2 questions of 1 marks each, which are
     multiple choice questions. Section B contains 2 questions of 2
     marks each, section C contains 2 questions of 3 marks each and
     Section D contains 2 questions of 4 marks each.
4. There is no overall choice in the paper. However internal choice
     is provided in 1 question of 4 marks . In questions with choices
     only one of the choices to be attempted.
5. Use of calculators is not permitted.

SECTION – A

Question numbers 1 to 2 carry 1 mark each. In each question, four options are provided ,out of which one is correct. Select and write the correct option.

1. The derivative of 2^x w.r.t x. is - - - - -.
   (A) $2^x(\log 2)x^3$
   (B) $2^x(\log 2)x^2$
   (C) $2^x (\log 2) (2x)$
   (D) $2^x(\log 2)$

2. When the due date is counted from the date of acceptance of the bill then it is called bill of exchange - - - -.
   (A) before sight
   (B) after   sight
   (C) before date
   (D) after   date

SECTION – B

Question numbers 3 to 4 , carry 2 marks each.

3. If $x = a\cos\theta$, $y = b\sin\theta$. Show that $\dfrac{dy}{dx} = -\dfrac{b}{a}\cot\theta$.

4. If the function $f : R \to R$ is given by $f(x) = x^2 + 2$ and
   $g : R \to R$, given by $g(x) = \dfrac{x}{x-1}$. Find $f(g(x))$ and $g(f(x))$.

SECTION - C

Question numbers 5 to 6, carry 3 marks each.

5. Consider $f : R \to R$, given by $f(x) = 4x + 3$. Show that f is bijective.

6. If $x + y = \sin(xy)$. Find $\dfrac{dy}{dx}$.

SECTION - D

Question numbers 7 to 8, carry 4 marks each.

7. Discuss the continuity of the function f at $x = 0$,
   where f is given as
   $$f(x) = \frac{\sin 3x}{\tan 2x} \qquad \text{if } x < 0$$
   $$= \frac{3}{2} \qquad \text{if } x = 0$$
   $$= \frac{\log(1+3x)}{2x} \qquad \text{if } x > 0$$

8. Attempt any one of the following

   A bill drawn on April 14,2002 for 8 months, after date was discounted on July 24, 2002 at 5% p.a. If banker's gain on the basis of simple interest is Rs 20, for what sum was the bill drawn ?

   ### OR

   A bill of exchange of Rs 50,000 was drawn for the period of 5 months and was discounted by a bank at 5% p.a for Rs 49,500 on July 6th 2013. Find the date on which the bill was drawn.

*** The End ***