NATIONAL MANAGEMENT COLLEGE, THUDUPATHI.
CA FOUNDATION
PAPER – 3: BUSINESS MATHEMATICS, LOGICAL REASONING AND STATISTICS
Revision test 7 (02.04.2022)

Time Allowed : ½ hour **Maximum Marks: 25**

1)Find the value of dy /dx if $y = x^x$

(a) $x^x \log_e x$ (b) 1+logx (c) y logx (d) none of these

2) If f(x) = a $(x^2 + x + 1)^2$ and f ' (–1) = – 6 then the value of a =

(a) 1 (b) 2 (c) 3 (d) 4

3)If $2^x - 2^y = 2^{x+y}$, then dy/dx at x = y =2

a) 1 b) 2 c) 4 d) 5

4) If the Cost of function of a commodity is given by $= 150x - 5x^2 + \frac{x}{6}$, where C stands for cost and x stands for output. If the average cost is equal to the marginal cost then the output x = _____

(a) 5 (b) 10 (c) 15 (d) 20

5) If $y = \frac{x^4}{e^x}$ then dy/dx is equal to :

a) $\frac{x^3(4-x)}{(e^x)\text{^}2}$ b) $\frac{x^3(4-x)}{(e^x)}$ c) $\frac{x^2(4-x)}{(e^x)}$ d) $\frac{x^3(4x-1)}{(e^x)}$

6) The speed of a train at a distance x (from the starting point) is given by $3x^2 - 5x + 4$. what is the rate of change (of distance) at $x = 1$?

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

7) U = $5t^4 + 4t^3 + 2t^2 + t + 4$ at $t = -1$ find dU/dt

a)-11 b)11 c)-16 d)16

8) The gradient of the curve $y = 2x^3 - 3x^2 - 12x + 8$ at $x = 0$ is

a) -12 b) 12 c) 0 d) 1

9) Find slope of tangent of curve Y = $\frac{x-1}{x+1}$ at $x = 2$

a)3/16 b)5/17 c) 9/11 d)None of these

10) If y = $2x + \frac{4}{x}$, then $x^2 \frac{d^2y}{dy^2} + x \frac{dy}{dx} - y$ yields,

a) 3 b) 1 c) 0 d) 4

11) . If f(x) = x^k and f `(1) = 10 then the value of k is

a)10 b) -10 c) 1/10 d) none of these

12) Given x = 2t + 5; y = t^2-2, then dy/dx is calculated as:

a) t b) 1/t c) -1/t d) none of these

13) If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, then $(1+x)^2 \frac{dy}{dx}$ =

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

14) The cost of C of a product is a function of the quantity x of the product:
C(x) = x^2 – 400x + 50. Find the quantity for which the cost is minimum.

a) 1000 b)1500 c)2000 d) 3000

15)I f u = $x^m y^n$ then

a) du = $mx^{m-1}y^n + nx^m y^{n-1}$ b) $du = mdx + ndy$

c)$udu = m\,xdx + n\,ydy$ d) $\frac{du}{u} = m\frac{dx}{x} + n\frac{dy}{y}$

16) The maximum value of $\left(\frac{1}{x}\right)^x$ is

a) e b) $e^{\frac{1}{e}}$ c)$\left(\frac{1}{e}\right)^e$ d)none of these

17) The slope of the tangent to the curve $y = x^2 - x$, where the line y=2 cuts the curve in the first quadrant is ,

a) 2 b) 3 c) -3 d) -2

18) If $y = x^a + a^x + x^x + a^a$ being “a” constant then dy/dx is

a) $ax^{a-1} + a^x log a + x^x(log x + 1)$

b) $ax^{a-1} + a^x log a + x^x(log x - 1)$

c) $ax^{a-1} + a^x log a - x^x(log x + 1)$

d) none

19) The derivative of a function $\sqrt{x+\sqrt{x}}$ is

a) $\frac{1}{2\sqrt{(x+\sqrt{x})}}$ b) 1+ $\frac{1}{2\sqrt{(x}}$ c) $\frac{1}{2\sqrt{x+\sqrt{x}}}(1+\frac{1}{2\sqrt{(x}})$ d)none of these

20)Find $\frac{dy}{dx}$, if Y = $e^{\log(logx)}$,

a) x b) $\frac{1}{x}$ c)$\frac{1}{logx}$ d) $e^{\log(logx)}$

21) $y = x^n$ then $\frac{dy}{dx}$ =

a) $\frac{x^{n+1}}{n+1}$ b) nx^{n-1} c) x^{n-1} d) nx^n

22)$\frac{d(constant)}{dx}$ =

a) 1 b) constant c) 0 d)none of these

23) A company can produce a maximum of 1500 widgets in a year. If they sell x widgets during the year then their profit, in dollars, is given by,

$P(x)=30{,}000{,}000-360{,}000x+750x^2-13x3$

How many widgets should they try to sell in order to maximize their profit?

a) 0 b) 300 c) 1200 d) 1500

24) The production costs, in dollars, per week of producing x widgets is given by,

$C(x)=4000-32x+0.08x^2+0.00006x^3$

and the demand function for the widgets is given by,

$D(x)=250+0.02x-0.001x^2$

What is the marginal revenue when x=200 and x=400?

a)152, 312 b) 132,-218 c) 164, -245 d) 112,156

25) The slope of the tangent at the point (2,-2) to the curve $x^2 + xy + y^2 - 4 = 0$ is given by

a)0 b) 1 c) -1 d) none