Beni Suef Technological University

Egyptian Korean Faculty of Technological Industry and Energy

Program of renewable energy

جامعة بني سويف التكنولوجية

BSU BANI SUEF TECHNOLOGICAL UNIVERSITY

Mathematics

First year students **Date:**

Final exam **Time:**

Name: **ID Number:** **Score:**

Q (1): Choose the correct answer:

1- If y = cos (2x), then $\frac{dy}{dx}$ =.....

a) -2sin2x	b) 2sin2x	c) 2cos x	d) -2cos x

2- If y = cot(x), then $\frac{dy}{dx}$ =.....

a) $-\csc^2(x)$	b) -csc(x) cot(x)	c) $-\cot^2(x)$	d) -cot(x)

3- If y =$sin^2(2x)$, then $\frac{dy}{dx}$ =.....

a)2sin2x(cos2x)2	b)4sin2x	c)2sin2x(cos2x)	d)2sin(x) cos(x)

4- If y =$sin^{-1}(x)$, then $\frac{dy}{dx}$ =.....

a) $\frac{1}{\sqrt{1-x^2}}$	b) $\frac{-1}{\sqrt{1-x^2}}$	c) $\frac{1}{\sqrt{1-2x}}$	d) $\frac{-1}{\sqrt{1-2x}}$

5- If y =$tan^{-1}(e^{x^3})$, then $\frac{dy}{dx}$ =.....

a) $\frac{1}{1+x^3}$	b) $\frac{-1}{\sqrt{1-x^3}}$	c) $\frac{1}{1+(e^{x^3})^2}$	d) $\frac{1}{1+(e^{x^3})^2} \cdot e^{x^3} \cdot 3x^2$

6- If y =$x^3\sin^{-1}(x)$, then $\frac{dy}{dx}$ =.....

a) $x^3 \cdot \frac{1}{1+x^2}$	b) $x^3 \cdot \frac{1}{\sqrt{1-x^2}}$
c) $3x^2 \sin^{-1}(x) - 3x^2 \frac{1}{\sqrt{1-x^2}}$	d) $3x^2 \sin^{-1}(x) + x^3 \frac{1}{\sqrt{1-x^2}}$

7- If y = $6x^3-9x+4$, then $\frac{dy}{dx}$ =.....

a) 18x - 9	b) $20x^2 + 9$	c) $18x^2 + 9$	d) $18x^2 - 9$

8- If y=$2t^4-10t^2+13$, then $\frac{dy}{dx}$ =.....

$8t^3 - 20t$

٢٠٢٢/١١/٢٧ ١٢:٠٣

a) $8t^2-20t+13$	b) $8t^3-2t+13$	c) $8t^3+20t$	d) $8t^3-20t$

9- If $y = x(3x^2-9)$, then $\frac{dy}{dx} =$ .....

a) $9x - 9$	b) $9x^3 - 9$	c) $6x^2 - 6$	d) $9x^2 - 9$

10- If $y = x^3 \tan x$, then $\frac{dy}{dx} =$ .....

a) $X^3 \sec^2 x$	b) $3x^2 \tan x$
c) $X^3 \sec^2 x + 3x^2 \tan x$	d) $X^3 \sec x + 3x^2 \tan x$

11- If $y = (\sin x)^{-1}$, then $\frac{dy}{dx} =$ .....

a) Cos x	b) -cos x	c) $-(\sin x)^{-2}.(\cos x)$	d) $-(\sin x)^{-1}.(\cos x)$

* 12- The domain of the function $y = x^2 - 4$ is.....

a) $R - \{-4\}$	b) $R - \{4\}$	c) R	d) ∞

13- The range of the function $y = \frac{1}{x+2}$ is.....

a) R	b) $R - \{2\}$	c) $R - \{0\}$	d) ∞

14- The domain of the function $y = (x-2)^3 + 1$ is.....

a) R	b) $R - \{2\}$	c) $R - \{-2\}$	d) ∞

15- The range of the function $y = 1-2^x$ is.....

a) $]-\infty, 1[$	b) R	c) $R - \{2\}$	d) ∞

16- The domain of the function $y = \ln x$ is.....

a) $]0, \infty[$	b) $]-\infty, 0[$	c) R	d) ∞

17- $\text{Ln}(\frac{x}{y}) =$ .....

a) $\ln x - \ln y$	b) $\ln x + \ln y$	c) $\ln(xy)$	d) 1

* 18- The function $f(x) = \begin{cases} \frac{x^2-4}{x-2} & x \neq 2 \\ 5 & x = 2 \end{cases}$ is continuous at x = 2.

a) True	b) False

19- $lim_{x\to 0} \frac{\sin 2\sqrt{x}}{\sqrt{x}} =$ .....

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

* 20- The function $f(x) = \sqrt[3]{x} + |x|$ is continuous at x = -8.

a) True	b) False

21- The amplitude of the function $f(x) = -4 \tan 3x$ is .....

Mathematics

a) 4	b) $\frac{\pi}{3}$	c) $\frac{2\pi}{3}$	d) ∞

22- The period of the function $f(x) = 3\sin x$ is .....

a) 3	b) $\frac{\pi}{2}$	c) π	d) 2π

23- $lim_{x\to\infty}\ (1+\frac{1}{x})^{x}$ is .....

a) 0	b) ∞	c) 1	d) e

24- $lim_{x\to-3}\ \frac{x^2+x-6}{x+3}$ is .....

a) 0	e) ∞	f) $-\infty$	g) -5

25- $lim_{x\to1}\ \frac{x^3-1}{x-1}$ is .....

a) 1	b) 2	c) 3	d) 0

26- $lim_{x\to3}\ \frac{x^2+x-12}{x-3}$ is .....

a) 7	b) 0	c) ∞	d) 12

27- Sinh 2x =.....

a) Cosh 2x -1	b) 1	c) 2 sinh x cosh x	d) cos^2x

28- $2\,cos^2x - 1$= .....

a) Cos 2x	b) Sin 2x	c) $2sin^2x$	d) $2cos^2x$

29- $sin^2x + cos^2x$ =.....

a) 1	b) Cos 2x	c) $2sin^2x$	d) Cos 2x

30- The amplitude of the function $f(x) = -2\cos 3x$ is ...

a) -2	b) $\frac{2\pi}{3}$	c) 2	d) $\frac{\pi}{3}$