FEDERAL UNIVERSITY OYE-EKITI
DEPARTMENT OF MATHEMATICS
SECOND SEMESTER EXAMINATION 2016/2017 SESSION

Course Code: MTH105 Unit: 3 units
Course Title: Elementary Maths. for Biological Sc.II Duration: 1hour

Instruction: Answer all questions, choose and indicate clearly the correct option for each question. Write your matriculation number and your department in spaces provided below.

Matriculation Number _____ Department _____

1) The range of the function f: Z to Z^+ defined as f(x)= 9|x| is

(a) Z (b) Z^+ (c) -9|x| (d) {9x : x is in Z^+}

2) The domain of the function $f(x)=2x^2-4$ (a) R-{1} (b) R-{-1} (c) R (d) {1}

3) Given that $f(x) = 4^x$. Find f(2+x). (a)$16(4^x)$ (b) $4(16^x)$ (c) $16(4^{2x})$ (d) $4(16^{2x})$

4) The point of removable discontinuity of $f(x)=(x^2-9)/(x-3)$ is (a)9 (b) -4 (c) -3 (d) 3

5) What is the ceiling of 16.1? (a) 16 (b) 16.2 (c) 17 (d) 17.2

6) What is the floor of -2.9? (a)-3 (b) -2 (c) -1 (d) -5

7) $\lim_{x->0}(\sin x)/x$ is (a) 0 (b) -1 (c) $\frac{1}{2}$ (d) 1

8) A point of inflection x = a is a point where (a) the derivative vanishes (b) the graph vanishes (c) the derivative turns (d) the graph turns

9) Find dy/dx if $y=1/x^2$ (a) $-2/x^3$ (B) -2/x (C) $2/x^3$ (D) 1/2x

10) Differentiate $\frac{3}{2}x^4 - 3x^2 + 6x - 1$. (a) $12x^3 - 6x + 6$ (b) $\frac{3}{2}x^4 - 6x + 6$

(c) $4x^3 - 6x + 6$ (d) $6x^3 - 6x + 6$

11) If $y = \frac{7x^2-2}{x^3-1}$, find $\frac{dy}{dx}$. (A) $\frac{-7x^4-6x^2-14x}{(x^3-1)^2}$ (B) $\frac{7x^4-6x^2-14x}{(x^3-1)^2}$ (C) $\frac{-7x^4-6x^2-14x}{(x^3+1)^2}$ (D) $\frac{-7x^4+6x^2-14x}{(x^3-1)^2}$

12) If $y = \sin x^3$, find $\frac{dy}{dx}$. (A) $x^3\cos x^2$ (B) $x^3\cos x^3$ (C) $3x^2\cos x^3$ (D) $3x^2\sin x^3$

13) $\frac{d}{dx}(\tan x) =$ (A) $\sec x$ (B) $\sec^2 x$ (C) $\tan 2x$ (D) $\tan^2 x$

14) $\frac{d}{dx}\log_e u$ where u is a function of x, gives (A) $\frac{1}{u}\frac{du}{dx}$ (B) $u\frac{du}{dx}$ (C) $\frac{\log e}{u}$ (D) $\frac{u}{\log e}$

15) Differentiate $(3x-5)^4$ (A) $3(3x-5)^3$ (B) (C) $3x-5)^3$ (D) $12(3x-5)^3$

16) Calculate $\frac{dy}{dx}$ if $xy^3-3x^2=xy-5$ (A) $\frac{6x-y^2-y}{3xy^2-x}$ (B) $\frac{6-y^2-y}{3xy^2-x}$ (C) $\frac{6xy-y^2-y}{3xy^2-x}$ (D) $\frac{6x-1}{3xy^2-x}$

17) Let $y=x^{-6}+3x^5+2x-1$ Calculate $\frac{dy}{dx}$ (A) $x^{-5}+15x^4-2$ (B) $-x^{-5}-15x^4+2$
(C) $-x^{-7}-15x^4-2$ (D) $x^{-7}+15x^4-2$

18) Find the derivative of $(x^2+1)(x-5)$ (A) $3x^2-10x+1$ (B) $3x^2+10x-1$
(C) $3x^2+10x+1$ (D) $3x^2+10x-1$

19) Find $\frac{d^2y}{dx^2}$ at $x=1$ when $y=(3x^2-4)^4$ (A) 408 (B) 480 (C) 208 (D) 80

20) Find $\frac{d^2y}{dx^2}$ if $y=x^3-7$ (A) $7x^2$ (B) $21x^2$ (C) $3x^2$ (D) $6x$

21) Differentiate e^{-5x} (A) $5e^{-5x}$ (B) $25e^{-5x}$ (C) $-5e^{-5x}$ (D) e^{-5x}

22) Evaluate $\int 3\cos x\,dx$
(a) $-3\sin x+c$ (b) $cosec^3x+c$ (c) $3cosec^2x+c$ (d) $3\sin x+c$

23) Evaluate $\int\frac{6}{x}dx$ (a) $6\ln x+c$ (b) $\frac{6}{\ln x}+c$ (c) $5x+c$ (d) $5\ln x+c$

24) Evaluate $\int x^{-5}\,dx$
(a) $-\frac{x^{-4}}{4}+c$ (b) $\frac{x^6}{6}+c$ (c) $-5x+c$ (d) $\frac{1}{4}x^3+c$

25) Calculate $\int e^{6x}dx$ (a) $6e^6+c$ (b) $\frac{e^{6x}}{6}+c$ (c) $e^{6x}+c$ (d) $\frac{e^{5x}}{5}+c$

26) Integrate $\int 5\sin x\,dx$ (a) $\sin^5x+c$ (b) $-5\cos x+c$ (c) $5\cos x+c$ (d) $\sin 5x+c$

27) Evaluate $\int(\cos 3x\,dx)$
(a) $-\sin 3x+c$ (b) $3\sin x+c$ (c) $\frac{1}{3}\sin 3x+c$ (d) $\tan 3x+c$

28) Evaluate $\int(x^5+3)$
(a) $\frac{1}{5}x^5+3x+c$ (b) $4x^5+3x+c$ (c) $5x+c$ (d) $\frac{1}{6}x^6-3x+c$

29) Evaluate the integral $\int_0^2 3x^5dx$
(a) 1565 (b)2137 (c) 2016 (d) 3145

30) Evaluate $\int_{-1}^{0}x^3dx$ (a) $-\frac{1}{4}$ (b) 3 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

Federal University Oye- Ekiti
Department of Mathematics
Second Semester Examination 2016/2017 Session

Course Code: MTH102
Course Title: Elementary Mathematics II

Unit: 3 units
Duration: 1hour

Instruction: Answer all questions, choose and indicate clearly the correct option for each question : Write your matriculation number and your department in spaces provided below.

Matriculation Number _____ Department _____

1) $\lim_{x\to 3}(x^2-9)/(x-3)$ is (a) 0 (b) -3 (c) -9 (d) 6

2) $\lim_{x\to 0}(1-\cos x)/x$ is (a) 0 (b) -1 (c) $\frac{1}{2}$ (d) 1

3) The derivative of $\frac{3}{2}x^4 - 3x^2 + 6x - 1$ is (a) $12x^3 - 6x - 6$ (b) $\frac{3}{2}x^4 - 6x + 6$
(C) $4x^3 - 6x + 6$ (d) $6x^3 - 6x - 6$

4) Find $\int \frac{1}{\sqrt[3]{x}}dx$ (a) $3x^{\frac{2}{3}} + c$ (b) $\frac{3x^{\frac{2}{3}}}{2} + c$ (c) $\frac{3}{2}x^{\frac{2}{3}} + c$ (d) $\frac{x}{2} + c$

5) Evaluate $\int \frac{12x^2-10}{4x^3+10x+5}dx$ (a) $\log_e(4x^3+10x+5)+c$ (b) $\log_e(12x^2+10)+c$
(c) $\frac{1}{\ln 4x^3+10x+5}$ (d) $\ln(12x^2+10)+c$

6) Find the area bounded by the curve $y = 3x^2 + 14x + 15$, the x-axis and ordinates at $x = -1$ and $x = 2$ (a) 75 unit^2 (b) 34 $unit^2$ (c) 66 $unit^2$ (d) 90 $unit^2$

7) Evaluate $\int sec^2 x\,dx$ (a) $2\tan x + c$ (b) $\frac{\operatorname{cosec} x}{x} + c$ (c) $2\cos x$ (d) $\tan x + C$

8) Find $\int e^{6x}dx$ (a) $6e^6 + c$ (b) $\frac{e^{5x}}{5} + c$ (c) $e^{6x} + c$ (d) $\frac{e^{6x}}{6} + c$

9) By partial fraction method, evaluate $\int \frac{5x+2}{3x^2-x-4}dx$ (a) $3\ln(3x-4)+c$ (b) $\frac{3}{2}\ln(5x+2)+c$
(c) $\frac{2}{3}\ln(3x+4) + \ln(x-1) + C$ (d) $\ln(3x^2+x-4)+c$

10) If $y = \frac{7x^2-2}{x^3-1}$, $\frac{dy}{dx} =$ (a) $\frac{-7x^4-6x^2-14x}{(x^3-1)^2}$ (b) $\frac{7x^4-6x^2-14x}{(x^3-1)^2}$ (c) $\frac{-7x^4-6x^2-14x}{(x^3-1)^2}$ (d) $\frac{-7x^4-6x^2-14x}{(x^3-1)^2}$

11) If $y = \sin x^3$, $\frac{dy}{dx} =$ (a) $x^3\cos x^2$ (b) $x^3\cos x^3$ (C) $3x^2\cos x^3$ (d) $3x^2\sin x^3$

12) If $x = \sin t^3$, $\frac{d^2x}{dt^2} =$ (a) $6t\cos t^3 - 9t^4\sin t^3$ (b) $6t\cos t^3 - 3\sin t$ (c)
$6t\cos t^3 - 9t^2\sin t^3$ (d) $6t\cos t^3 - 3t^4\sin t^3$

13) $\frac{d}{dx}\log_e u$ where u is a function of x, gives (a) $\frac{1}{u}\frac{du}{dx}$ (b) $u\frac{du}{dx}$ (c) $\frac{\log e}{u}$ (d) $\frac{u}{\log e}$

14) If $y = \sec x$, then $\frac{dy}{dx}$ gives (a) $\sec 2x$ (b) $\sec x \tan x$ (c) $\sec x \cos x$ (d) $\tan 2x$

15) Differentiate $(3x-5)^4$ (a) $3(3x-5)^5$ (b)$12x$ (c) $(3x-5)^3$ (d) $12(3x-5)^3$

16) Calculate $\frac{dy}{dx}$ if $xy^3 - 3x^2 = 3y - 5$ (a) $\frac{6x-y^2+y}{3xy^2-x}$ (b) $\frac{6-y^2+y}{3xy^2-x}$ (c) $\frac{6xy-y^3+y}{3xy^2-x}$ (d) $\frac{6x-1}{3xy^2-x}$

17) The range of the function f: Z to Z^+ defined as f(x)= 12|x|is (a)Z (b) Z^+ (c) 12x (d) {12x : x is in Z^+ }

18) The domain of the function $f(x) = 4x^3 - 3x + 15$ is (a)R-{1} (b) R-{-1} (c) R (d) {1}

19) Given that $f(x) = 2^x$. Find $f(x)f(x-2)$. (a) $4(2^{2x})$ (b) (2^{2x}) (c) 3^{2x} (d) $3(9^{2x})$

20) The point of removable discontinuity of $f(x)=(x^2-4)/(x-2)$ is (a)4 (b) -4 (c) -2 (d) 2

21) The ceiling of 6.1? (a)4 (b)65 (c)54 (d) 7

22) What is the floor of -3.4? (a) -4 (b) -3 (c) -2 (d) -6

23) Let $y = x^{-8} + 3x^5 + 2x - 1$. Calculate $\frac{dy}{dx}$ (a) $x^{-9} + 15x^4 + 2$ (b) $-x^{-9} - 15x^4 + 2$ (C) $-x^{-7} + 15x^4 + 2$ (d) $x^{-7} + 15x^4 + 2$

24) Evaluate $\frac{d}{dx}\sin(5x-2)$ (a) $\cos(5x-2)$ (b) $-\cos(5x-2)$ (C) $5\cos(5x-2)$ (d) $-5\cos(5x-2)$

25) Find the derivative of $(x^2+1)(x-5)$ (A) $3x^2 - 10x + 1$ (B) $3x^2 + 10x - 1$ (C) $3x^2 + 10x + 1$ (D) $3x^2 - 10x - 1$

26) Find $\frac{d^2y}{dx^2}$ at $x = 1$ when $y = (3x^2-4)^4$ (A) 408 (B) 480 (C) 208 (D) 80

27) Differentiate e^{-5x} (A) $5e^{-5x}$ (B) $25e^{-5x}$ (C) $-5e^{-5x}$ (D) e^{-5x}

28) $\int 5\sin x\, dx =$ (a) $\sin^5 x + c$ (b) $-5\cos x + c$ (c) $5\cos x + c$ (d) $\sin 5^x + c$

29) Evaluate $\int x^2 \tan 2x^3 dx$ (a) $\frac{\sec^2 2x^3}{6} + c$ (b) $3\tan 6x + c$ (c) $\frac{1}{2\cos^2 x} + c$ (d) $\frac{3x}{\sec^2 x}$

30) Let $x = \sin t^3$, find $\frac{d^2x}{dt^2}$. (a) $6t\cos t^3 - 9t^4 \sin t^3$ (b) $6t\cos t^3 - 3\sin t$

(c) $6t\cos t^3 - 9t^2 \sin t^3$ (d) $6t\cos t^3 - 3t^4 \sin t^3$