University of BBA	Faculty of SNV
Mathematics Exam	Date: 18/01/2024
Name: _____ Group: _____	Surname: _____

Choose the correct answer.

Questions	Answers
Q1. Evaluate $\int (3x^2 - 2x + 1)\,dx$	☒ $x^3 - x^2 + x + C$ ☐ $\frac{x^3}{3} - x^2 + x + C$ ☐ $\frac{x^3}{3} - x + 1 + C$ ☐ $\frac{x^3}{3} + x + 1 + C$
Q2. Compute $\int \frac{-2}{x+2}\,dx$	☒ $-2\ln\lvert x+2\rvert + C$ ☐ $\ln(x+2) + C$ ☐ $\frac{-1}{2}\ln\lvert x+2\rvert + C$ ☐ $\ln\lvert x+2\rvert + C$
Q3. Find $\int e^{2x}\,dx$	☒ $\frac{1}{2}e^{2x} + C$ ☐ $e^{2x} + C$ ☐ $2e^{2x} + C$ ☐ $\frac{1}{4}e^{2x} + C$
Q4. Evaluate $\int \sin(3x)\,dx$	☒ $-\frac{1}{3}\cos(3x) + C$ ☐ $\frac{1}{3}\sin(3x) + C$ ☐ $-\cos(3x) + C$ ☐ $\frac{1}{2}\cos(3x) + C$
Q5. Compute $\int \frac{2}{\sqrt{x}}\,dx$	☒ $4\sqrt{x} + C$ ☐ $2\sqrt{x} + C$ ☐ $\sqrt{x} + C$ ☐ $\frac{4}{3}x^{3/2} + C$
Q6. Find $\int \frac{1}{1+x^2}\,dx$	☒ $\arctan(x) + C$ ☐ $\frac{1}{2}\arctan(x) + C$ ☐ $\frac{1}{2}\tan(1+x^2) + C$ ☐ $\tan(x) + C$
Q7. Compute $\int \cos^2(x)\,dx$	☒ $\frac{1}{2}x + \frac{1}{4}\sin(2x) + C$ ☐ $\frac{1}{2}x - \frac{1}{4}\sin(2x) + C$ ☐ $\sin^2(x) + C$ ☐ $\frac{1}{2}\cos(x)\sin(x) + \frac{1}{4}x + C$
Q8. Investigate the convergence of the series: $\sum_{n=1}^{\infty} \frac{1}{n^2}$	☒ Convergent ☐ Divergent ☐ Conditionally convergent ☐ Does not converge
Q9. Determine the convergence of the series. $\sum_{n=1}^{\infty} \left(\frac{3}{4}\right)^n$	☒ Convergent ☐ Divergent ☐ Conditionally convergent ☐ Does not converge

Questions	Answers
Q10. Explore the convergence of the series: $\sum_{n=1}^{\infty} \frac{n!}{2^n}$	☐ Convergent ☒ Divergent ☐ Conditionally convergent ☐ Does not converge
Q11. Check the convergence of the series. $\sum_{n=1}^{\infty} \frac{n+1}{3n+5}$	☐ Convergent ☒ Divergent ☐ Conditionally convergent ☐ Does not converge
Q12. Determine the convergence of the series. $\sum_{n=1}^{\infty} (-1)^n \frac{1}{n}$	☐ Convergent ☐ Divergent ☒ Conditionally convergent ☐ Does not converge
Q13. Find the sum of the convergent series. $\sum_{n=1}^{\infty} \frac{1}{2^n}$	☒ 1 ☐ $\frac{1}{2}$ ☐ 2 ☐ ∞
Q14. Find the sum of the series: $\sum_{n=1}^{\infty} \frac{1}{n(n+1)}$	☒ 1 ☐ $\frac{\pi}{3}$ ☐ $-\frac{\pi}{4}$ ☐ $-\frac{\pi}{6}$
Q15. Consider the function $f(x,y) = 3x^2y - 2xy^2 + 1$. Find $\frac{\partial f}{\partial x}$.	☒ $6xy - 2y^2$ ☐ $6xy - 4xy$ ☐ $6xy + 2y^2$ ☐ $6x^2 - 4y^2$
Q16. For $f(x,y) = x^3 + 2y^2 - xy$, calculate $\frac{\partial^2 f}{\partial x^2}$.	☐ $6x - y$ ☐ $6x + y$ ☐ $6 - y$ ☒ $6x$
Q17. Given $f(x,y) = e^{xy}\sin(x)$, find $\frac{\partial f}{\partial y}$.	☐ $xe^{xy}\cos(x)$ ☐ $e^{xy}\cos(x)$ ☒ $xe^{xy}\sin(x)$ ☐ $e^{xy}\sin(x) + xe^{xy}\cos(x)$
Q18. Find $\frac{\partial}{\partial x}(2xy^2 - \cos(x))$.	☒ $2y^2 + \sin(x)$ ☐ $2y^2 + \cos(x)$ ☐ $4xy - \sin(x)$ ☐ $-2y^2 - \sin(x)$
Q19. Calculate $\frac{\partial^2}{\partial y^2}(4x^2y - 3y^2 + 2)$.	☒ -6 ☐ $-6x$ ☐ $-6y$ ☐ $6x$
Q20. For $f(x,y) = \frac{x^2}{y} + \sin(xy)$, determine $\frac{\partial f}{\partial y}$.	☒ $-\frac{x^2}{y^2} + x\cos(xy)$ ☐ $-\frac{2x}{y} + \cos(xy)$ ☐ $\frac{x^2}{y^2} + x\cos(xy)$ ☐ $\frac{x}{y} + x\cos(xy)$