Amity University Dubai

Amity Placement Test

MATHEMATICS

Marks: 30 **Time: 90 min**

Name: ……

Date of Exam: …… …….. **Signature of Invigilator:……**

Marks Obtained: ……. **Signature of Evaluator:……**

General Instructions for students

1. Attempt all questions. Each question carry 1 mark.
2. Fill all the details with ink /ball point pen only.
3. Do not keep electronic Diary / mobile phone in examination room.
4. Strict disciplinary action will be initiated against any student found using unfair means.
5. When the allotted time gets over, student should stop further writing and handover the answer books to the invigilator.

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1. What is the union of $A = \{1, 2\}$ and $B = \{2, 3\}$?
   (a) $\{1, 2, 3\}$
   (b) $\{2\}$
   (c) $\{1, 3\}$
   (d) $\{1, 2\}$

2. If $A = \{1, 2, 3\}$ and B = {3, 4, 5}, what is $A - B$?
   (a) $\{1, 2\}$
   (b) $\{3, 4, 5\}$
   (c) $\emptyset$
   (d) $\{4, 5\}$

3. The domain of the function $f(x) = 1/(x - 2)$ is:
   (a) $x < 2$
   (b) All real numbers
   (c) $x > 0$
   (d) All real numbers except $x = 2$

4. Find $f(2)$ for the polynomial function $f(x) = x^2 - 3x + 5$
   (a) -1
   (b) 3

(c) 5
(d) 7

5. If $f(x) = x + 2$ and $g(x) = x^2$, what is $(f \circ g)(x)$?
(a) $(x + 2)^2$
(b) $x^2 + 2$
(c) $x + 2$
(d) $2x^2$.

6. The derivative of $f(x) = 3x^2$ is:
(a) x^2
(b) $3x$
(c) $6x$
(d) 3

7. If the velocity is given by $v(t) = 3t^2 + 2t$, what is the acceleration?
(a) $6t + 2$
(b) $3t$
(c) $2t$
(d) $3t^2$

8. The polar form of $1 + i$ is:
(a) $\sqrt{2}\,(cos\,\pi/4 + i\,sin\,\pi/4)$
(b) $2\,(cos\,\pi/4 + i\,sin\,\pi/4)$
(c) $cos\,\pi/4 + i\,sin\,\pi/4$
(d) $\sqrt{2}\,(cos\,\pi/2 + i\,sin\,\pi/2)$

9. Solve the inequality $3x - 5 > 7$.
(a) $x < 4$
(b) $x \geq 4$
(c) $x \leq 4$
(d) $x > 4$

10. Solve the system of equations: $x + y = 5$ and $2x - y = 4$.
(a) $(1, 4)$
(b) $(3, 2)$
(c) $(4, 1)$
(d) $(2, 3)$

11. Which of the following is the result of $\begin{bmatrix} 1 & -2 \\ 3 & -4 \end{bmatrix} + \begin{bmatrix} 5 & 6 \\ -7 & 8 \end{bmatrix}$?
(a) $\begin{bmatrix} 1 & 0 \\ 0 & -4 \end{bmatrix}$
(b) $\begin{bmatrix} 0 & -2 \\ 3 & 0 \end{bmatrix}$
(c) $\begin{bmatrix} 6 & 4 \\ -4 & 4 \end{bmatrix}$
(d) $\begin{bmatrix} 21 & 2 \\ 5 & -24 \end{bmatrix}$

12. Expand: $(x + 2)(x - 2)$.
(a) x^2
(b) $x^2 - 2x$
(c) $x^2 - 4$
(d) $x^2 + 4$

13. Find the 5th term of the arithmetic sequence, $an + d$, where $a = 3$ and $d = 2$.
(a) 7
(b) 13
(c) 11
(d) 9

14. What is the cosine of a 90-degree angle?
(a) -1
(b) 0
(c) Undefined.
(d) 1

15. The equation of a circle with center (0, 0) and radius 3 is:
(a) $x^2 - y^2 = 9$
(b) $x^2 + y^2 = 3$
(c) $x^2 + y^2 = 6$
(d) $x^2 + y^2 = 9$

16. The vertex of the parabola $y = x^2$ is at:
(a) $(0, 1)$
(b) $(-1, -1)$
(c) $(0, 0)$
(d) $(1, 1)$

17. The slope of the line passing through $(1, 2)$ and $(3, 6)$ is:
(a) 4
(b) 3
(c) 2
(d) 1

18. The distance between $(1, 1)$ and $(4, 5)$ is:
(a) 4
(b) 5
(c) $\sqrt{24}$
(d) $\sqrt{16}$

19. The integral of x^2 with respect to x is:
(a) $\frac{x^3}{3} + C$
(b) $3x^2$
(c) $x^2 + C$
(d) $2x$

20. The integral of $sin(x)$ with respect to x is:
(a) $cos(x) + C$
(b) $-sin(x) + C$
(c) $-cos(x) + C$
(d) $sin(x) + C$

21. What is the mean of the data set $\{1, 3, 5, 7\}$?
(a) 4
(b) 5
(c) 3
(d) 6.

22. What is the range of the data set $\{2, 4, 6, 8\}$?
(a) 2
(b) 8
(c) 6
(d) 4.

23. If two dice are rolled, the probability of getting a sum of 7 is:
(a) 1/7
(b) 1/36
(c) 5/36
(d) 6/36.

24. The complement of the set $A = \{1, 2\}$ in the universal set $U = \{1, 2, 3, 4\}$ is:
(a) $\{1,2\}$
(b) $\{3,4\}$
(c) $\emptyset$
(d) $\{1, 2, 3, 4\}$

25. The equation of a line with slope 2 passing through $(0, 3)$ is:
(a) $y = 3x + 2$
(b) $y = x + 2$
(c) $y = 2x$
(d) $y = 2x + 3$

26. Find the value of $f(g(2))$ for $f(x) = x + 1$ and $g(x) = x^2$.
(a) 3
(b) 4
(c) 5
(d) 9

27. Which of the following is NOT a polynomial?
(a) $2x^2 + 3x + 4$
(b) $1/x$
(c) $x^3 + 5$
(d) $4x - 1$

28. If $P(A) = 0.3$ and $P(B) = 0.4$, and events A and B are mutually exclusive, i.e. no intersection, what is $P(A \cup B)$?
(a) 0.6
(b) 1.0
(c) 0.7
(d) 0.24

29. The area under the curve $f(x) = x$ from $x = 0$ to $x = 2$ is:
(a) 2
(b) 4
(c) 1
(d) $\int_0^2 2x\, dx$

30. The derivative of $cos(x)$ is:
(a) $sin(x)$
(b) $-sin(x)$
(c) $-cos(x)$
(d) $cos(x)$

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