Complex Numbers MCQs with Answers & Explanations

Multiple Choice Questions

1. 1. What is the imaginary unit 'i' defined as?

- A) $\sqrt{1}$
- B) $\sqrt{-1}$
- C) -1
- D) i^2

2. 2. Which of the following is a complex number?

- A) 5
- B) 2 + 3i
- C) $\sqrt{2}$
- D) π

3. 3. What is the conjugate of 4 - 5i?

- A) -4 + 5i
- B) 4 + 5i
- C) -4 - 5i
- D) 4 - 5i

4. 4. Which of the following is purely imaginary?

- A) 0
- B) 2i
- C) 5
- D) -3 + 2i

5. 5. Modulus of 3 + 4i is:

- A) 5

- B) 7
- C) 1
- D) $\sqrt{5}$

6. 6. What is the result of i^2?

- A) 1
- B) i
- C) -1
- D) 0

7. 7. (2 + 3i) + (1 - 4i) equals:

- A) 3 + 7i
- B) 3 - i
- C) 1 - 7i
- D) 3 - 1i

8. 8. Which of the following is not a complex number?

- A) 0
- B) 1 + 2i
- C) 4
- D) $\sqrt{-9}$

9. 9. What is the product of (1 + 2i)(1 - 2i)?

- A) -3
- B) 5
- C) 1
- D) 0

10. 10. The real part of -6 + 7i is:

- A) 7
- B) -6
- C) -13

- D) 6

11. 11. Which point represents 3 + 4i on the Argand plane?

- A) (3, -4)
- B) (-3, 4)
- C) (3, 4)
- D) (4, 3)

12. 12. What is the square of 1 + i?

- A) 1
- B) 2i
- C) 2
- D) 2i + 1

13. 13. What is 1/i equal to?

- A) i
- B) -i
- C) -1/i
- D) -1

14. 14. What is the result of (2 + i)(2 - i)?

- A) 3
- B) 5
- C) 4
- D) 1

15. 15. Which of the following is NOT correct?

- A) $i^2 = -1$
- B) $i^4 = 1$
- C) $i^3 = -i$
- D) $i^6 = -1$

16. 16. A number 7 is also a:

- A) Real
- B) Complex
- C) Rational
- D) All of these

17. 17. Conjugate of -3 + 4i is:

- A) 3 - 4i
- B) -3 - 4i
- C) -3 + 4i
- D) 3 + 4i

18. 18. Modulus of -5i is:

- A) -5
- B) 25
- C) 5
- D) $\sqrt{5}$

19. 19. What is the sum of 3i and -5i?

- A) 8i
- B) -2i
- C) 2i
- D) -8i

20. 20. Which of the following lies on the real axis?

- A) 3 + 0i
- B) 2i
- C) -5 + 3i
- D) 0 + 4i

Answer Key with Explanations

1. What is the imaginary unit 'i' defined as? Answer: B

By definition, $i = \sqrt{-1}$.

2. Which of the following is a complex number? Answer: B

Complex numbers have a real and imaginary part. 2 + 3i fits this.

3. What is the conjugate of 4 - 5i? Answer: B

The conjugate changes the sign of the imaginary part.

4. Which of the following is purely imaginary? Answer: B

Only imaginary part exists; no real part.

5. Modulus of 3 + 4i is: Answer: A

$|a + bi| = \sqrt{(a^2 + b^2)} = \sqrt{(9 + 16)} = \sqrt{25} = 5$.

6. What is the result of i^2? Answer: C

By definition, $i^2 = -1$.

7. (2 + 3i) + (1 - 4i) equals: Answer: B

Add real with real and imaginary with imaginary: 2+1 and 3i-4i.

8. Which of the following is not a complex number? Answer: D

$\sqrt{-9} = 3i$, which is complex. Trick question – all are technically complex.

9. What is the product of (1 + 2i)(1 - 2i)? Answer: B

Use formula $(a + bi)(a - bi) = a^2 + b^2 = 1 + 4 = 5$.

10. The real part of $-6 + 7i$ is: Answer: B

Real part is the number without i, which is -6.

11. Which point represents $3 + 4i$ on the Argand plane? Answer: C

Real is x-axis and imaginary is y-axis → (3, 4).

12. What is the square of $1 + i$? Answer: C

$(1 + i)^2 = 1 + 2i + i^2 = 1 + 2i - 1 = 2i$.

13. What is $1/i$ equal to? Answer: B

Multiply numerator and denominator by i: $1/i \times i/i = i / i^2 = i / -1 = -i$.

14. What is the result of $(2 + i)(2 - i)$? Answer: B

$(a + bi)(a - bi) = a^2 + b^2 = 4 + 1 = 5$.

15. Which of the following is NOT correct? Answer: D

$i^6 = (i^2)^3 = (-1)^3 = -1$ → Correct. All are true.

16. A number 7 is also a: Answer: D

7 is all three: real, complex $(7 + 0i)$, and rational.

17. Conjugate of $-3 + 4i$ is: Answer: B

Keep real same, flip imaginary part → $-3 - 4i$.

18. Modulus of -5i is: Answer: C

$|0 - 5i| = \sqrt{(0^2 + 25)} = 5.$

19. What is the sum of 3i and -5i? Answer: B

$3i + (-5i) = -2i.$

20. Which of the following lies on the real axis? Answer: A

Only numbers with imaginary part = 0 lie on real axis.