ADVANCED MATH CLASSES

@ Think Academy, Najafgarh

Standard : XI
Subject : Mathematics (041)

MCQ TEST-1

Maximum Marks : 45
Time Allowed : 1 Hour

*All the Questions in this paper (from 01 to 45) carry **1 mark** each.*
***Select correct option** in each of the questions.*

01. Domain of $f(x)=\frac{1}{\sqrt{x^2-5x-6}}$ is

(a) $\mathbb{R}$ (Real nos.) (b) $\mathbb{R}-[-1, 6]$ (c) $\mathbb{R}-\{-1\}$ (d) $\mathbb{R}-\{-1, 6\}$

02. For $\frac{3(x-2)}{5}\geq\frac{5(2-x)}{3}$, $x\in$

(a) $(\infty, 2]$ (b) $[2,\infty)$ (c) $(-\infty, 2]$ (d) $(\infty, 2)$

03. For $z=\left(\frac{3-4i}{1+i}\right)$, $\mathrm{Re}(z)$ equals

(a) $-\frac{1}{2}-\frac{7}{2}i$ (b) $\frac{1}{2}$ (c) $\frac{7}{2}$ (d) $-\frac{1}{2}$

04. $\{x : x$ is a two digit number so that the sum of its digits is one$\}$ in the tabular form, is given by

(a) $\{10\}$, $\{01\}$ both (b) $\{100\}$ (c) $\{10\}$ (d) $\{01\}$

05. If $|x|\geq 3$, then $x\in$

(a) $(-3,3)$ (b) $[-3,3]$ (c) $(-\infty,-3)\cup(3,\infty)$ (d) $(-\infty,-3]\cup[3,\infty)$

06. If $A=\{0\}$, then A is

(a) null set (b) infinite set (c) singleton set (d) disjoint set

07. If $A=\{1, 2, 3, 4\}$ and, $B=\{5, 6, 7\}$, then no. of functions defined from A to B is

(a) 64 (b) 81 (c) 4096 (d) 144

08. For the function $f(x)=[x]$, where [.] is greatest integer function, the range of $f(x)$ is

(a) Z^+ (b) Z^- (c) $[0,\infty)$ (d) Z

09. For $X=\{2, 4, 6\}$ and $Y=\{1, 3, 6, 10, 15\}$, $X-Y=$

(a) $\{2, 4\}$ (b) $\{2, 4, 6\}$ (c) $\{1, 3, 10, 15\}$ (d) ϕ

10. $\mathrm{cosec}(-1410^\circ)$ equals

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

11. If $A=\{1,2,3\}$, $B=\{4,5\}$ then, a relation R defined from A to B, having maximum no. of elements is given by

(a) $B\times B$ (b) $A\times A$ (c) $A\times B$ (d) $B\times A$

12. For the sets $A=\{2,3\}$, $B=\{4,5,6\}$, the total number of relations from A to B will be

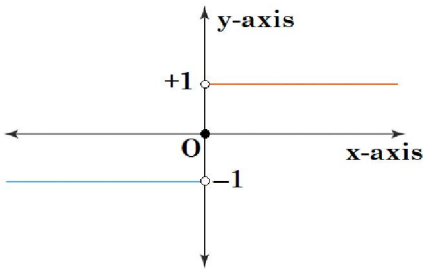
(a) 64 (b) 16 (c) 512 (d) 0

13. If $z=1-\sqrt{3}i$ then, $|z|$ equals

(a) 4 (b) -2 (c) 2 (d) ± 2

14. Let $A = \{1,2,3\}$, $B = \{4,5,6\}$.
For a relation $R' : B \to A$ defined as $R' = \{(x,y) : x \in B,\ y \in A;\ x \text{ is divisible by } y\}$, the roster form is given by
(a) $\{(1,4),(2,4),(1,5),(1,6),(2,6),(3,6)\}$ (b) $\{(4,1),(4,2),(5,1),(6,1),(6,2),(6,3)\}$
(c) $\{(4,1),(4,2),(5,1),(6,1),(6,2)\}$ (d) $\{(4,1),(4,2),(6,1),(6,2),(6,3)\}$

15. Consider the graph shown.



Which function is represented by this graph?
(a) Greatest integer function
(b) Modulus function
(c) Signum function
(d) Logarithmic function

16. $\cos^2 x + \cos^2(x+120^\circ) + \cos^2(x-120^\circ) =$
(a) $\frac{3}{2}$ (b) $\frac{1}{2}$ (c) 3 (d) $-\frac{3}{2}$

17. If U is a universal set and A is a non-empty set then, which of the following is not true?
(a) $A \cup U = A$ (b) $A \cup U = U$ (c) $A \cap U = A$ (d) $A \cap A' = \phi$

18. If U is a universal set and A is a non-empty set then, which of the following is true?
(a) $A \cup U = A$ (b) $A \cup A' = A$ (c) $A \cap A' = \phi$ (d) $A \cap U' = A$

19. Which one of the following pair of sets is non disjoint?
(a) $\{1,2,3\}, \{4,5\}$ (b) $\{1,2\}, \{3,4,5\}$ (c) $\{1,3,5\}, \{2,4\}$ (d) $\{1,2,3\}, \{3,4,5\}$

20. Let $A = \{x : x \in N,\ x^2 + x - 2 = 0\}$. Then the cardinal number of set A is
(a) 2 (b) 0 (c) 1 (d) $\{1\}$

21. For the set A as given in **20**, what is the total number of subsets of A?
(a) 2 (b) 0 (c) 1 (d) 4

22. For $A = \{1,2,3,4,5\}$, $B = \{4,5,6,7\}$, $A \cup B =$
(a) $\{4,5\}$ (b) $\{1,2,3,4,5,6,7\}$ (c) $\{\ \}$ i.e., ϕ (d) $\{1,2,3,6,7\}$

23. For $A = \{1,2\}$, $B = \{3,4,5,6,7\}$, $A \cap B =$
(a) $\{4,5\}$ (b) $\{1,2,3,4,5,6,7\}$ (c) $\{\ \}$ i.e., ϕ (d) $\{1,2,3,6,7\}$

24. For $A = \{1,2,3,4\}$, $B = \{4,5,6\}$, $A - B =$
(a) $\{4,5,6\}$ (b) $\{1,2,3\}$ (c) $\{4\}$ (d) $\{5,6\}$

25. If $\sin x = -\frac{1}{3}$, $x \in \left(\pi, \frac{3\pi}{2}\right)$ then, $\tan x =$
(a) $-2\sqrt{2}$ (b) $2\sqrt{2}$ (c) $-\sqrt{2}$ (d) $\frac{1}{2\sqrt{2}}$

26. Let $n(A) = 3$, $n(B) = 6$, $n(A \cap B) = 2$. Then $n(A \cup B) =$
(a) 11 (b) 7 (c) 1 (d) 0

27. For the sets $A = \{2,3\}$, $B = \{4,5,6\}$, the total number of functions from A to B will be
(a) 8 (b) 9 (c) 512 (d) 64

28. Domain of $f(x) = \frac{1}{[x]}$ is given by $x \in$
(a) $\mathbb{R}$ (Real nos.) (b) Z (c) $\mathbb{R} - Z$ (d) $\mathbb{R} - [0,1)$

29. $f(x) = \sqrt{|x| - x}$ is defined when $x \in$

(a) $\mathbb{R}$ (Real nos.) (b) Z (c) $\mathbb{R}-\mathbb{R}^-$ (d) $\mathbb{R}-\{0\}$

30. For $f(x)=-|x|$, the range is given by

(a) $\mathbb{R}$ (Real nos.) (b) $[0,\infty)$ (c) $\mathbb{R}-\mathbb{R}^-$ (d) $(-\infty,0]$

31. Range of $f(x)=\sqrt{25-x^2}$ is

(a) $\mathbb{R}$ (Real nos.) (b) $[0,5)$ (c) $[0, 5]$ (d) $(0,5]$

32. $\sin(22.5^\circ)=$

(a) $\sqrt{\frac{\sqrt{2}+1}{2\sqrt{2}}}$ (b) $\sqrt{\frac{\sqrt{2}-1}{2}}$ (c) $\sqrt{\frac{\sqrt{2}-1}{2\sqrt{2}}}$ (d) $\sqrt{\frac{1-\sqrt{2}}{2\sqrt{2}}}$

33. Domain of $f(x)=\frac{|x|}{1+|x|}$ is

(a) $\mathbb{R}$ (Real nos.) (b) $\mathbb{R}-\{-1\}$ (c) $\mathbb{R}-\{0\}$ (d) $\mathbb{R}-\mathbb{R}^-$

34. For $U=\{1,2,3,....,9\}$, $A=\{1,3,5,7,8\}$, $A'=$

(a) $\{2,4,6,8\}$ (b) $\{2,4,6,8,9\}$ (c) $\{2,3,4,6,8\}$ (d) $\{2,4,6,9\}$

35. If $\tan 2x=\frac{2\tan x}{m-\tan^2 x}$ then, $m=$

(a) 2 (b) –1 (c) 1 (d) –2

36. If $z=\frac{1-i}{i}$ then, $\bar{z}$ equals

(a) $-1-i$ (b) $-1+i$ (c) $1+i$ (d) $1-i$

37. An angle 225°, in radian equals

(a) $\frac{3\pi}{4}$ (b) $-\frac{5\pi}{4}$ (c) $\frac{5\pi}{4}$ (d) $-\frac{3\pi}{4}$

38. Let $A=\{1,2,3\}$, $B=\{4,5,6\}$. Let $S: A\to B$, where $S=\{(1,4),(2,5),(3,6)\}$. Then, S is

(a) a relation only (b) a function only
(c) a relation and function both (d) neither relation nor function

39. If $z=-1-\sqrt{3}\,i$ then, $\arg(z)=$

(a) $-\frac{\pi}{3}$ (b) $-\frac{2\pi}{3}$ (c) $\frac{\pi}{3}$ (d) $-\frac{5\pi}{6}$

40. Additive inverse of $z=-1+i$ is given by

(a) $-1-i$ (b) $1-i$ (c) $1+i$ (d) $0-i$

*Followings are **Assertion-Reason based questions** (from **Q41 - Q45**).*
Read the following statements carefully to **mark the correct option** out of the options given below.

(a) Assertion (A) is true, Reason (R) is true; Reason (R) is a correct explanation for Assertion (A).
(b) Assertion (A) is true, Reason (R) is true; Reason (R) is not a correct explanation for Assertion (A).
(c) Assertion (A) is true, Reason (R) is false.
(d) Assertion (A) is false, Reason (R) is true.

41. **Assertion (A) :** ${}^{10}C_3=120$.

Reason (R) : ${}^nC_r=\frac{n!}{(n-r)!}$.

42. **Assertion (A) :** A total of 360 words can be generated using all the letters of BHARAT, (with or without meaning).

Reason (R) : Total no. of Combinations of n different things taken r at a time is given by ${}^nC_r$.

43. **Assertion (A) :** Third term in $\left(\frac{x}{3}+\frac{1}{x}\right)^5$, $x \neq 0$ is given by $\frac{10x}{27}$.

Reason (R) : In the binomial $(a+b)^n$, $T_{r+1} = {}^nC_r\, b^r\, a^{n-r}$.

44. **Assertion (A) :** For $2(2x+3)-10 \leq 6(x-2)$, $x \in [4,\infty)$.

Reason (R) : For $-5 \leq \frac{2-3x}{4} \leq 9$, $x \in \left[-\frac{34}{3}, \frac{22}{3}\right]$.

45. **Assertion (A) :** If $\cos x = -\frac{1}{3}$, then $\cos\frac{x}{2} = -\frac{1}{\sqrt{3}}$, when $x \in$ III Quadrant.

Reason (R) : $\cos 2A = 2\cos^2 A - 1$.

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With a lot of Blessings!

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