

31. What is the number of ways of arranging the letters of the word 'BANANA' so that no two N's appear together ?

(a) 40

(b) 60

(c) 80

~~(d) 100~~

Ans: A

32. Consider the equation  $(x - p)(x - 6) + 1 = 0$  having integral coefficients. If the equation has integral roots, then what values can p have ?

(a) 4 or 8

(b) 5 or 10

(c) 6 or 12

(d) 3 or 6

Ans: A

33. What is the equivalent binary number of the decimal number 13.625 ?

(a) 1101.111

(b) 1111.101

(c) 1101.101

(d) 1111.111

Ans: C

34. What is the value of

$$\left(\frac{i + \sqrt{3}}{-i + \sqrt{3}}\right)^{200} + \left(\frac{i - \sqrt{3}}{i + \sqrt{3}}\right)^{200} + 1?$$

(a) -1

~~(b) 0~~

(c) 1

(d) 2

Ans: B

35. The order of a set A is 3 and that of a set B is 2. What is the number of relations from A to B ?

(a) 4

(b) 6

(c) 32

(d) 64

Ans: D

36. What is the value of  $\frac{\log_{\sqrt{\alpha\beta}}(H)}{\log_{\sqrt{\alpha\beta\gamma}}(H)}$  ?

(a)  $\log_{\alpha\beta}(\alpha)$

(b)  $\log_{\alpha\beta\gamma}(\alpha\beta)$

(c)  $\log_{\alpha\beta}(\alpha\beta\gamma)$

(d)  $\log_{\alpha\beta}(\beta)$

Ans: C

37. The 59<sup>th</sup> term of an AP is 449 and the 449<sup>th</sup> term is 59. Which term is equal to 0 (zero) ?

(a) 501<sup>st</sup> term

(b) 502<sup>nd</sup> term

~~(c) 508<sup>th</sup> term~~

(d) 509<sup>th</sup> term

Ans: C

38. For a set A, consider the following statements

1.  $A \cup P(A) = P(A)$

2.  $\{A\} \cap P(A) = A$

3.  $P(A) - \{A\} = P(A)$

Ans: D

where P denotes power set.

Which of the statements given above is/are correct ?

~~(a) 1 only~~

(b) 2 only

(c) 3 only

(d) 1, 2 and 3

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39. If the AM and HM of two numbers are 27 and 12 respectively, then what is their GM equal to?

- (a) 12  $\frac{a+b}{2} = 27$   
 (b) 18 **Ans: B**  $a+b = 54$   
 (c) 24  $\frac{1}{a} + \frac{1}{b} = 12$   
 (d) 27  $\frac{ab}{a+b}$

40. If  $\tan A = \frac{1}{2}$  and  $\tan B = \frac{1}{3}$ , then what is the value of  $(A + B)$ ?

- (a) 0  
 (b)  $\frac{\pi}{4}$  **Ans: B**  
 (c)  $\frac{\pi}{2}$   
 (d)  $\pi$

41. If  $(4, 0)$  and  $(-4, 0)$  are the foci of an ellipse and the semi-minor axis is 3, then the ellipse passes through which one of the following points?

- (a)  $(2, 0)$   
 (b)  $(0, 5)$  **Ans: D**  
 (c)  $(0, 0)$   
 (d)  $(5, 0)$

42. Under what condition do the planes  $bx - ay = n$ ,  $cy - bz = l$ ,  $az - cx = m$  intersect in a line?

- (a)  $a + b + c = 0$   
 (b)  $a = b = c$  **Ans: C**  
 (c)  $al + bm + cn = 0$   
 (d)  $l + m + n = 0$

43. What is the maximum point on the curve  $x = e^x y$ ?

- (a)  $(1, e)$   
 (b)  $(1, e^{-1})$  **Ans: B**  
 (c)  $(e, 1)$   
 (d)  $(e^{-1}, 1)$

44. The function  $f(x) = e^x$ ,  $x \in \mathbb{R}$  is

- (a) Onto but not one-one  
 (b) One-one onto **Ans: C**  
 (c) One-one but not onto  
 (d) Neither one-one nor onto

45. If  $y = \sin^{-1}\left(\frac{4x}{1+4x^2}\right)$ , then what is  $\frac{dy}{dx}$  equal to?

- (a)  $\frac{1}{1+4x^2}$   
 (b)  $-\frac{1}{1+4x^2}$  **Ans: C**  
 (c)  $\frac{4}{1+4x^2}$   
 (d)  $\frac{4x}{1+4x^2}$

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