

CHAPTER 22- MISCELLANEOUS

EE24BTECH11021 - Eshan Ray

SECTION-B [JEE Main/AIEEE]

61. The statement $\sim (p \leftrightarrow \sim q)$ is: [JEE – M2014]
 (a) a tautology
 (b) a fallacy
 (c) equivalent to $p \leftrightarrow q$
 (d) equivalent to $\sim p \leftrightarrow q$
62. Let A and B be two sets containing four and two sets respectively. Then the number of subsets of $A \times B$, each having at least three elements is: [JEE – M2015]
 (a) 275
 (b) 510
 (c) 219
 (d) 256
63. The negation of $\sim s \vee (\sim r \wedge s)$ is equivalent to: [JEE – M2015]
 (a) $s \vee (r \vee \sim s)$
 (b) $s \wedge r$
 (c) $s \wedge \sim r$
 (d) $s \wedge (r \wedge \sim s)$
64. The mean of the data set comprising of 16 observations is 16. If one of the observation valued 16 is deleted and three new observations valued 3, 4 and 5 are added to the data, then the mean of the resultant data, is: [JEE – M2015]
 (a) 15.8
 (b) 14.0
 (c) 16.8
 (d) 16.0
65. If $f(x) + 2f\left(\frac{1}{x}\right) = 3x, x \neq 0$ and $S = \{x \mid R : f(x) = f(-x)\}$; then S: [JEE – M2016]
 (a) contains exactly two elements.
 (b) contains more than two elements.
 (c) is an empty set.
 (d) contains exactly one element.
66. The Boolean Expression $(p \wedge \sim q) \vee q \vee (\sim p \wedge q)$ is equivalent to: [JEE – M2016]
 (a) $p \cup q$
 (b) $p \vee \sim q$
 (c) $\sim p \wedge q$
 (d) $p \cup q$
67. If the standard deviation of the numbers 2, 3, a and 11 is 3.5, then which of the following is true? [JEE – M2016]
 (a) $3a^2 - 34a + 91 = 0$
 (b) $3a^2 - 23a + 44 = 0$
 (c) $3a^2 - 26a + 55 = 0$
 (d) $3a^2 - 32a + 84 = 0$
68. A man is walking towards a vertical pillar in a straight path, at a uniform speed. At a certain point A on the path, he observes that the angle of elevation of the top of the pillar is 30. After walking for the 10 minutes from A in the same direction, at a point B, he observes that the angle of elevation of the top of the pillar is 60. Then the time taken (in minutes) by him, from B to reach the pillar, is: [JEE – M2016]
 (a) 20
 (b) 5
 (c) 6
 (d) 10
69. The following statement $(p \rightarrow q) \rightarrow [(\sim p \rightarrow q) \rightarrow q]$ is: [JEE – M2017]
 (a) a fallacy
 (b) a tautology
 (c) equivalent to $\sim p \rightarrow q$
 (d) equivalent to $p \rightarrow \sim q$
70. $\sum_{i=1}^9 (x_i - 5) = 9$ and $\sum_{i=1}^9 (x_i - 5)^2 = 45$, then the standard deviation of the 9 items x_1, x_2, \dots, x_9 is: [JEE – M2018]
 (a) 4
 (b) 2
 (c) 3
 (d) 9
71. The Boolean Expression $\sim (p \vee q) \vee (\sim p \wedge q)$ is equivalent to: [JEE – M2018]
 (a) p
 (b) q
 (c) $\sim q$
 (d) $\sim p$
72. Let $S = \{x \in R : x \geq 0\}$ and $2|\sqrt{x} - 3| + \sqrt{x}(\sqrt{x} - 6) + 6 = 0$. Then S: [JEE – M2018]
 (a) contains exactly one element.

- (b) contains exactly two elements.
 (c) contains exactly four elements.
 (d) is an empty set.
73. If the Boolean expression $(p \oplus q) \wedge (\sim p \odot q)$ is equivalent to $p \wedge q$, where $\oplus, \odot \in \{\wedge, \vee\}$ then the ordered pair (\oplus, \odot) is: [JEE – M2019 – 9JAN]
- (a) (\vee, \wedge)
 (b) (\vee, \vee)
 (c) (\wedge, \vee)
 (d) (\wedge, \wedge)
74. 5 students of a class have an average height 150 cm and variance 18 cm^2 . A new student, whose height is 156 cm joined them. The variance (in cm^2) of the height of these six students is: [JEE – M2019 – 9JAN]
- (a) 16
 (b) 22
 (c) 20
 (d) 18
75. If the standard deviation of the numbers $-1, 0, 1, k$ is $\sqrt{5}$ where $k > 0$, then k is equal to: [JEE – M2019 – 9April]
- (a) $2\sqrt{6}$
 (b) $2\sqrt{\frac{10}{3}}$
 (c) $4\sqrt{\frac{5}{3}}$
 (d) $\sqrt{6}$
76. For any two statements p and q, the negative of the expression $p \vee (\sim p \wedge q)$ is: [JEEM2019 – 9April]
- (a) $\sim p \wedge \sim q$
 (b) $p \wedge q$
 (c) $p \leftrightarrow q$
 (d) $\sim p \vee \sim q$