

# CHAPTER 22- MISCELLANEOUS

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## 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  $30^\circ$ . 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  $60^\circ$ . 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  $18 \text{ cm}^2$ . A new student, whose height is 156 cm joined them. The variance ( $\text{in cm}^2$ ) 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)  $\sim p \vee \sim q$