MA:MATHEMATICS-2013

AI24BTECH11005 - Bhukya Prajwal Naik

53) Let $q_1, \ldots, q_{n_0+1}$ be $n_0 + 1$ distinct points and $Y = X \backslash \{q_1, \ldots, q_{n_0+1}\}$. Let m be the number of connected components of Y. The maximum possible value of m is

Statement for Linked Answer Questions 54 and 55:

Let $W(y_1, y_2)$ be the Wronskian of two linearly independent solutions y_1 and y_2 of the equation $y'' + P(x)y' + Q(x)y = 0$.

54) The product $W(y_1, y_2)P(x)$ equals

a) $y_2y_1'' - y_1y_2''$ b) $y_1y_2' - y_2y_1'$ c) $y_1'y_2'' - y_2'y_1''$ d) $y_2'y_1' - y_1''y_2''$

55) If $y_1 = e^{2x}$ and $y_2 = xe^{2x}$, then the value of $P(0)$ is

a) 4 b) -4 c) 2 d) -2

General Aptitude (GA) Questions

Q. 56 - Q. 60 carry one mark each.

56) A number is as much greater than 75 as it is smaller than 117. The number is:

a) 91 b) 93 c) 89 d) 96

57) The professor ordered to the students to go out of the class. Which of the given sentence is gramatically wrong

a) The professor b) ordered to c) the students d) of the class

58) Which of the following options is the closest in meaning to the word given below: Primeval

a) Modern b) Historic c) Primitive d) Antique

59) Friendship, no matter how ( ) it is, has its limitations

a) cordial b) intimate c) secret d) pleasant

60) Select the pair that best expresses a relationship similar to that expressed in the pair: Medicine: Health

a) Science: Experiment
b) Wealth: Peace
c) Education: Knowledge
d) Happiness

Q. 61 to Q. 65 carry two marks each.

61) X and Y are two positive real numbers such that $2X + Y \leq 6$ and $X + 2Y \leq 8$. For which of the following values of (X, Y) the function $f(X, Y) = 3X + 6Y$ will give maximum value?

a) $(\frac{4}{3}, \frac{10}{3})$ b) $(\frac{8}{3}, \frac{20}{3})$ c) $(\frac{8}{3}, \frac{10}{3})$ d) $(\frac{4}{3}, \frac{20}{3})$

62) If $|4X - 7| = 5$ then the values of $2|X| - |-X|$ is:

a) $2, \frac{1}{3}$ b) 1.0 c) 2.0 d) 4.0

63) Following table provides figures (in rupees) on annual expenditure of a firm for two years - 2010 and 2011.

In 2011, which of the following two categories have registered increase by same percentage?

Category	**2010**	**2011**
Raw material	5200	6240
Power & fuel	7000	9450
Salary & wages	9000	12600
Plant & machinery	20000	25000
Advertising	15000	19500
Research & Development	22000	26400

a) Raw material and Salary & wages
b) Salary & wages and Advertising
c) Power & fuel and Advertising
d) Raw material and Research & Development

64) A firm is selling its product at Rs. 60 per unit. The total cost of production is Rs. 100 and firm is earning total profit of Rs. 500. Later, the total cost increased by 30%. By what percentage the price should be increased to maintained the same profit level.

a) 5 b) 10 c) 15 d) 30

65) Abhishek is elder to Savar.
Savar is younger to Anshul. Which of the given conclusions is logically valid and is inferred from the above statements?

a) Abhishek is elder to Anshul
b) Anshul is elder to Abhishek
c) Abhishek and Anshul are of the same age
d) No conclusion follows