J.K. SHAH CLASSES

MATHEMATICS & STATISTICS

SYJC TEST – 03 – SET 1

DURATION – 1 $^{1}/_{2}$ HR **MARKS – 40**

TOPIC : DIFFERENTIATION + RATIO – PROPORTION + PARTNERSHIP + COMMERCIAL ARITHMETIC (PART)

SECTION - I

Q1. Attempt any THREE of the following (2 marks each) **(6 marks)**

01. $y = \sin^{-1}\left(3x - 4x^3\right)$ Find dy/dx

02. $y = \tan^{-1}\left(\frac{6x}{1 - 5x^2}\right)$ Find dy/dx

03. $y = \tan^{-1}\left(\frac{\sin x}{1 + \cos x}\right)$ Find dy/dx

04. $y = x^{\sin^{-1} x}$ Find dy/dx

Q2. Attempt any TWO of the following (3 marks each) **(6 marks)**

01. $x^a y^b = (x + y)^{a+b}$. Show that : $\frac{dy}{dx} = \frac{y}{x}$

02. $y = (\tan x)^{\sin x}$ Find dy/dx

03. $x^y = e^x$ Show that : $\frac{dy}{dx} = \frac{\log x - 1}{(\log x)^2}$

Q3. Attempt any TWO of the following (4 marks each) **(8 marks)**

01. $y = x^x + (7x - 1)^x$ Find dy/dx

02. $\cos^{-1}\left(\frac{x^2 - y^2}{x^2 + y^2}\right) = 2k$ Show that : $y\frac{dy}{dx} = x\tan^2 k$

03. $y = \tan^{-1}\sqrt{\frac{1-\sin x}{1+\sin x}}$. Find dy/dx

SECTION - II

Q4. **Attempt any THREE of the following** (2 marks each) **(6 marks)**

01. Maya and Jaya started a business by investing equal amount . After 8 months Jaya withdrew her amount and Priya entered the business with same amount of capital . At the end of the year there was a profit of ₹ 13,200 . Find their share of profit

02. the wholesaler allows 25% trade discount and 5% cash discount . What will be the net price of an article marked at ₹ 1600

03. An agent sold a car and charged 3% commission on the sale value . If the owner of the car received ₹ 48,500 , find the sale value of the car

04. the income of an agent remains unchanged though the rate of commission is increased from 6% to 7.5% . Find the percentage reduction in the value of business

Q5. **Attempt any TWO of the following** (3 marks each) **(6 marks)**

01. a furniture dealer allows 20% discount on the list price and further discount of 5% for cash payment for a chair . Find the list price of the chair if it was sold for the net amount of ₹ 2,090

02. The ratio of number of boys and girls in a school is 3 : 2 . If 20 % of the boys and 30% of the girls are scholarship holders , find the percentage of students who are not scholarship holders

03. The ratio of incomes of Salim & Javed was 20:11 . Three years later income of Salim has increased by 20% and income of Javed was increased by ` 500 . Now the ratio of their incomes become 3 : 2 . Find original incomes of Salim and Javed

Q6. Attempt any TWO of the following (4 marks each) **(8 marks)**

01. Incomes of Mr. Shah , Mr Patel and Mr Mehta are in ratio 1 : 2 : 3 while their expenditures are in the ratio 2 : 3 : 4 . If Mr Shah saves 20% of his income , find the ratio of their savings

02. John and Mathew started a business with their capitals in the ratio 8 : 5 . After 8 months , John added 25% of his earlier capital as further investment . At the same time , Mathew withdrew 20% of his earlier capital . At the end of the year , they earned ₹ 52,000 as profit . How should they divide the profit between them

03. X and Y are partners in a business with their capitals as ₹ 2,00,000 and ₹ 3,00,000 respectively . Z wishes to join the business with a capital of ₹ 3,00,000 at the beginning of the financial year . They agree that the goodwill be taken as twice the average annual for the last three years . Last three years profits are ₹ 60,000 , ₹ 90,000 and ₹ 90,000 respectively . Find the goodwill amount that Z would be required to pay X and Y separately