

SMT M.M.K COLLEGE OF COMMERCE AND ECONOMICS
SYJC FIRST UNIT TEST – 2018
MATHEMATICS AND STATISTICS

DATE: 29 / 08 / 18

1 Hr.
TIME : ~~45 MINS~~
M.M : 25

I) Attempt any 4 of the following questions: (8)

i) Write the negation of the following statement

a) Rajani is rich if and only if she is a doctor

b) $p \wedge (q \rightarrow r)$

ii) Find the adjoints of the matrix $A = \begin{bmatrix} 2 & -3 \\ 3 & 5 \end{bmatrix}$

iii) Find the value of k if $f(x) = \frac{\tan 7x}{2x}$, for $x \neq 0$

$= k$, for $x = 0$, is continuous at $x = 0$

iv) Raghu, Madhu and Ramu started a business in partnership by investing Rs 60,000 , Rs 40,000 and Rs 75,000 respectively. At the end of the year they found that they have incurred a loss of Rs 24,500. Find how much loss each one had to bear.

v) A certain job can be performed by 10 men in 24 days working 8 hours a day . How many days would be needed to perform the same job by 8 men working 12 hours a day?

II) Attempt any 3 of the following questions : (9)

i) Express the following statements by Venn diagrams

a) Some nonresident Indians are not rich.

b) No circle is a rectangle.

c) If n is a prime number and $n \neq 2$, then it is odd.

ii) If $A = \begin{bmatrix} 1 & 3 & 3 \\ 3 & 1 & 3 \\ 3 & 3 & 1 \end{bmatrix}$ then show that $A^2 - 5A$ is a scalar matrix.

iii) Find the accumulated value of annuity due of Rs 500 p.a. for 3 years at 10% p.a. compounded annually [Given: $(1.1)^3 = 1.331$]

Pg. 1

- iv) The True discount on sum is $\frac{3}{8}$ of the sum due at 12% p.a. Find the period of the bill.

III) Attempt any 2 of the following questions: (8)

- i) A bill of Rs 4000 drawn on 5th January 1998 for 8 months was discounted for Rs 3840 on a certain date. Find the date on which it was discounted at 10% p.a.

- ii) Express the following equations in matrix form and solve them by the method of reduction

$$X+2y+z = 8, \quad 2x+3y-z = 11 \quad \text{and} \quad 3x-y-2z = 5.$$

- iii) Find a and b if f is continuous at $x = 1$, where

$$\begin{aligned} f(x) &= \frac{\sin \pi x}{x-1} + a, & x < 1 \\ &= 2\pi, & x = 1 \\ &= \frac{1 + \cos \pi x}{\pi(1-x)^2} + b, & x > 1 \end{aligned}$$

Pg. 2