Karnataka Sangha's
MANJUNATHA COLLEGE OF COMMERCE &
JUNIOR COLLEGE OF COMMERCE
IInd Term Exam March 2019

Class: F.Y.J.C **Sub.:- Mathematics** **Marks: 80**
Date:-20.03.2019 **Timing: 2.00 to 5.00pm**

SECTION - I

Q.1 Attempt Any Six **5**

i) Evaluate the following:

$$\sin 0 + \cos 0 + 3\sin\left(\frac{\pi}{2}\right) + 4\cos\left(\frac{\pi}{2}\right) + 5\sec 0 + 6\operatorname{cosec}\left(\frac{\pi}{2}\right)$$

ii) Find the value of $\tan 75^{O}$

iii) Find the value of x if $\begin{vmatrix} x & -1 & 2 \\ 2x & 1 & -3 \\ 3 & -4 & 5 \end{vmatrix} = 29$

iv) Find the value of determinants $\begin{vmatrix} 1 & 1001 & 17 \\ 3 & 3003 & 19 \\ 5 & 5005 & 23 \end{vmatrix}$

v) Evaluate $\lim_{x\to 0} \frac{x^3+9}{x^2+6}$

vi) Find value of k if $\lim_{x\to k} \frac{x^5-k^5}{x-k} = 5$

vii) Differentiate $y = 3\log x + 5x^2 + \cot x$

viii) The demand D of biscuits at price P is given by $D = \frac{64}{P^3}$. Find the marginal demand when price is Rs.2

Q.2 A) Attempt Any Two: **6**

i) Discuss whether limit exist if

$f(x) = x^2 + x + 1 \quad 2 \le x \le 3$

$= 2x + 1 \quad 3 < x \le 4$

As x tends to 3

ii) Examine the consistency of the following equations

$x + y = 2$

$2x + 3y = 5$

$3x - 2y = 1$

iii) Prove that $\sin 2A(\tan A + \cot A) = 2$

B) Attempt Any Two: **8**

i) Find $\frac{dy}{dx}$ if $y = \frac{3x^2-4}{x+5}$

ii) If $f(x) = f(3x - 1)$ for

$f(x) = x^2 - 4x + 11$ find x.

iii) The sum of three numbers is 6. Thrice the third number when added to the first number gives 7. On adding the sum of second and third numbers to three times the first number, we get 12. Find the three numbers using determinants.

Q.3 A) Attempt Any Two: **6**

i) Evaluate $\lim_{x\to 2} \left(\frac{1}{x-2} - \frac{3}{x^2-x-2}\right)$

ii) If $\cos\theta = \frac{4}{5}, \frac{3\pi}{2} < \theta < 2\pi$ then find the value of $\sin 2\theta$

iii) Find the derivative of $\tan(x.e^x)$

B) Attempt Any Two: **8**

i) The total cost of producing x items is given by $C = x^2 + 4x + 4$. Find the average cost and marginal cost. What is the marginal cost when x = 7 ?

ii) Test whether the given points are collinear or not, using determinants :

P(3 , 8) , Q(- 4 , 2) and R(10 , 4)

iii) Evaluate $\lim_{x\to 0}\left(\frac{15^x-3^x-5^x+1}{x^2}\right)$

SECTION II

Q.4 Attempt Any Six **12**

i) Examine whether set of data are consistent

(A) = 50 , (AB) = 10 , (αB) = 150 , N = 120

ii) Calculate the lower quartile of the following raw data :

116, 121, 126, 113, 107, 115, 123, 129, 113, 120, 128

iii) Compute ${}^nC_r$ if n = 8 and r = 8

iv) Find the number of distinct permutation of the word "EXAMINATION"

v) Find Price Index Number using simple Aggregate Method

Commodity	Price in 1980 (in Rs.)	Price in 1985 (in Rs.)
I	22	46
II	38	36
III	20	28
IV	18	44
V	12	16

vi) Calculate cost of living index number for the following data :

Group	Food	Clothing	Fuel & lighting	House Rent	Miscellaneous
I	180	120	300	200	160
W	4	5	6	18	3

vii) Two dice are thrown, find the probability of sum of the numbers on two dice is divisible by 3 or 4.

Q.5 A) **Attempt Any Two:** 6

i) A factory employs both graduate and non-graduate workers. The probability that a worker chosen at random is a graduate is 0.67, that the worker is married is 0.72 and that the worker is a married graduate is 0.5.Find the probability that a worker chosen at random is a graduate or married or both?

ii) Find the value of n if

${}^nC_{n-3} = 84$

iii) Given that, the Laspeyre's and Paasche's Price Index Numbers are 25 and 16 respectively, find the values of Drobish-Bowley's and Fisher's Price Index Numbers.

B) **Attempt Any Two:** 8

i) Calculate D_8 and P_{30}

House Rent (in Rs)	1100	1120	1130	1170	1200	1250	1280	1300
No. of houses	25	17	13	15	14	8	6	2

ii) Out of 400 students, 160 were married. Among 120 students who failed, 48 were married. Find the coefficient of association between attributes marriage and failure in examination.

iii) A card is drawn from a pack of 52 playing cards. It is kept aside. Then a second card is drawn from the remaining 51 cards. Find the probability that both the cards are queens.

Q.6 A) **Attempt Any Two:** 6

i) Let A & B be two mutually exclusive & exhaustive events defined on sample space S. If 3P(A) = P(B).Find P(A) & P(B)

ii) A card is drawn from a pack of 52 cards. What is the probability that card is either red or black?

iii) Find y from the following data if the Quantity Index Number is 120.

Commodity	A	B	C	D
Base year	50	40	20	5
Current year	60	40	15	y

B) **Attempt Any Two:** 8

i) How many words can be formed using the letters of the word 'LOGARITHM' if

a)vowels are always together

b) no two vowels are together

ii) Two dice are thrown. Find the probability that the sum of the points is atleast 10 given that if exceeds 7.

iii) $\sum p_1 q_1 = 300$, $\sum p_1 q_0 = 320$,

$\sum p_0 q_0 = 120$, $P_{01}(M - E) = 200$.

Find $P_{01}(P)$

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