Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2020-21

EXM/P/09/00

Year and Program: F.Y. MCA (Computer Applications)	**School of Computer Science and Applications**	**Department: M.C.A.**
Course Code: MCA 101	**Course Title: Computational Mathematics**	**Semester : I**
Day and Date: Monday,07.06.2021	**End Semester Examination**	**Time : 2 Hrs.** **Max Marks : 50**

Instructions: 1) All Questions are compulsory.

2) Use of non-programmable calculator is allowed.

3) Assume suitable data wherever necessary.

		Marks	Bloom's Level	CO
Q.1	**Answer/Solve the following (any Two)**–			
a)	Explain: Cardinality of Power Set of set with cardinality n is 2^n.	8	L1	CO1
b)	Let $A = \{a, b, c, d, e\}$, $B = \{a, b, c, l, m, n\}$ and $C = \{q, w, e, r, t\}$ then find i) $A \cup B$ and Cardinality of $A \cup B$ ii) $A \cap B \cap C$ and cardinality of $A \cap B \cap C$ iii) $(A \cap B) - C$ iv) $A \Delta B$	8	L1	CO2
c)	Find the inverse by elementary transformation. $P = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 2 \\ 1 & 0 & 0 \end{bmatrix}$	8	L1	CO1
Q.2	**Answer/Solve the following (any two)** –			
a)	Reduce given matrix A to echelon form. $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & 4 \\ 1 & 2 & 1 \end{bmatrix}$.	8	L3	CO3

b) Find all solutions : 8 L3 CO3

$x + 3y - 2z = 0$

$2x - y + 4z = 0$

$x + y = 0$

c) In a sample of 1000 students the mean and standard deviation of marks obtained by the students in a certain tests are 14 and 2.5. Assuming the distribution to be normal find the number of students getting marks 8 L3 CO4

i) between 12 and 15

ii) above 18

iii) below 8.

(Given : for standard normal variate z, area between z=0 and z=0.4 is 0.1554 , that between z=0 and z=0.8 is 0.2881 ,that between z=0 and z=1.6 is 0.4452 that between z=0 and z=2.4 is 0.4918)

Q.3 Answer/Solve the following (any two) –

a) The following table gives the marks in two short examinations obtained by 5 students in Mathematics. 9 L2 CO5

Marks in the first exam (X) : 6 2 10 4 8

Marks in Second exam (Y) : 9 11 5 8 7

Determine the two lines of regression by the method of least squares.(Use assumed mean method)

b) The following data give the age of cars of a certain make and the annual maintenance cost.Obtain the equation of the line of regression of cost on age.(Use assumed mean method) 9 L2 CO5

Age of Cars (in years) x: 2 4 6 8

Maintenance Cost(in Rs) y: 10 20 25 29

Estimate the maintenance cost of the car of age 5.

c) Three jobs A,B,C are to assigned to three machine X,Y and Z. The processing costs are as given in the matrix shown below. Find the allocation which will minimise the overall processing cost. 9 L2 CO6

Jobs	Machine			
		X	Y	Z
	A	19	28	31
	B	11	17	16
	C	12	15	13

*****