T.Y.B.Sc. EXAMINATION OCT-2017

M-303 ADVANCED NUMERICAL METHODS AND DESCREATE MATHEMATICS - 8963

TIME:-3 HOURS

INSTRUCTIONS: (1) All questions are compulsory. (2) Each question carries equal marks

TOTAL MARKS:-100

QUE. 1	A	Apply Graffee's root squaring method to determine the approximate roots of the equation $x^3 - 7x^2 + 10x - 2 = 0$.	7M
	B	Describe Muller's method.	7M
	C	Describe Symmetric function of roots.	6M
		OR	
QUE. 1	A	Describe Horner's method.	7M
	B	Describe Lin-Bairstow's method.	7M
	C	Use Ramanujan's method to find smallest root of equation sin = 1-x.	6M
QUE. 2	A	Discuss Jacobi method of iteration	7M
	B	Discuss method of Factorization.	7M
	C	Solve the equation by gauss Jordan method x + 2y + z = 8 , 2x + 3y + 4z = 20 , 4x + 3y + 2z = 16.	6M
		OR	
QUE. 2	A	Find inverse of matrix using Crout's Method. $\begin{bmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \\ 2 & 1 & 3 \end{bmatrix}$	7M
	B	Solve by seidel method of iteration the system 8x - 3y + 2z = 20, 6x + 3y + 12z =35 and 4x + 11y – z = 33.	7M
	C	Discuss Gauss elimination method.	6M
QUE. 3	A	Draw the Hasse diagram of (S_{60} , D).	7M
	B	If (P, ≤) is Poset , then (P,≥) is also Poset.	7M
	C	For set S = { 2 ,3 , 6, 12 , 24 , 36 } prove that (S , D) is a Poset but not lattice.	6M
		OR	
QUE. 3	A	If (P, R) is Poset , then (P, $\tilde{R}$) is also Poset , where $\tilde{R}$ is converse relation of R.	7M
	B	For (a , b), (c, d) ∈ NxN , (a , b) R (c, d)⇔ ad = bc. Prove that R is an equivalence relation on NxN. Also find [(3 , 4)].	7M
	C	Prove that (N, ≤) is a lattice ,where a ≤ b ⇔ a is factor of b.	6M
QUE. 4	A	(B , *,⊕, ' , 0 ,1) is Boolean algebra a, b ϵ B prove that a ≤ b ⇔ a∗b'=0 ⇔ b'≤ a' ⇔ a'⊕ b=1.	7M
	B	State and prove distributive inequalities for lattice	7M
	C	Define : Boolean isomorphism , atom of Boolean algebra, and find atoms of $(B,*,\oplus,',0,1)$ where B=S_{30}	6M
		OR	

QUE. 4	A	State and prove De-Morgan's laws in Boolean algebra.	7M
	B	(P(A), $*, \oplus$) is lattice where for X,Y$\in$ P(A) X$*$ Y = X $\cap$ Y and X$\oplus$ Y= X $\cup$ Y	7M
	C	(L, $*, \oplus$) is lattice for a,b$\in$ L aRb $\Leftrightarrow$ a $\oplus$ b=b prove that R is equivalence relation on L.	6M
QUE. 5	A	$(B,*,\oplus,',0,1)$ is Boolean algebra , for any $x_1, x_2 \in B$ $A(x_1 * x_2) = A(x_1) \cap A(x_2)$	7M
	B	Prove : sum of all min-terms of n-variables $X_1,\ldots,X_n$ is 1	7M
	C	Obtain sum of product canonical form of $\alpha(x_1, x_2, x_3) = x_1x_2' + x_3$	6M
		OR	
QUE. 5	A	$(B,*,\oplus,',0,1)$ is for Boolean algebra. for any $x_1, x_2 \in B$ $A(x_1 \oplus x_2) = A(x_1) \cup A(x_2)$	7M
	B	$(B,*,\oplus,',0,1)$ is Boolean algebra, for x,y$\in$ B prove that , $x \le y \Leftrightarrow x * y' = 0 \Leftrightarrow y' \le x' \Leftrightarrow x' \oplus y = 1$.	7M
	C	Obtain product of sum canonical form of $\alpha(x_1, x_2, x_3) = x_1 x_2 x_3$.	6M