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Question Bank

Subject Code: 15BMC6S1 **Subject Name:** Skill Based Subject-4: Fuzzy Logic and Neural Networks **Programme** B.Sc Mathematics (CA)**Section -A**

- 841 1 . The Number of elements in a set is called
 (a)Cardinality (b)Singleton (c)Subset (d)None
- 842 2 . Crisp sets takes values
 (a)Between 0 and 1 (b)Exactly 0 and 1 (c)Only 1 (d)None of these.
- 843 3 . Fuzzy sets takes values
 (a)Between 0 and 1 (b)Exactly 0 and 1 (c)Only 1 (d)None of these.
- 844 4 . Demargons law $A' \cap B' =$ -----
 (a) $(A \cup B)'$ (b) $(A \cap B)'$ (c) $(A \cup B)$ (d) $(A \cap B)$
- 845 5 . The property of crisp set is idempotence $(A \cup A)$
 (a)B' (b)A (c)1 (d) $(A \cup B)$
- 846 6 . Justify whether the set “ Is water colorless
 (a)Fuzzy set (b)Crisp set (c)Welldefined set (d)Covering
- 847 7 . Fuzziness means
 (a)Vagueness (b)Constants (c)Variables (d)None
- 848 8 . Is Ram honest
 (a)Crisp (b)Fuzzy (c)Both a&b (d)None
- 849 9 . The universal Discourse is denoted by
 (a)E (b)U (c)V (d)T
- 850 10 . A-----is a well defined collection of objects.
 (a)Set (b)Proper set (c)Subset (d)Super set
- 851 11 . _____ are pictorial representations to denote a set.
 (a)Venn diagrams (b)Crisp (c)Fuzzy (d)None
- 852 12 . A set whose members are sets themselves , is referred to as a _____
 (a)Set (b)Proper set (c)Subset (d)Family set
- 853 13 . A set if it has no members.-----
 (a)Set (b)Null set (c)Subset (d)Family set
- 854 14 . A ----- on A is defined to be a set of non-empty subsets .
 (a)Partition (b)Covering (c)Both a&b (d)None
- 855 15 . A-----on A is defined to be a set of non-empty subsets
 (a)Partition (b)Covering (c)Both a&b (d)None
- 856 16 . A set with a single element is called-----
 (a)Set (b)Singleton set (c)Subset (d)Super set
- 857 17 . The membership function values need not always be described by
 (a)Zero values (b)Two values (c)Discrete values (d)Perfect values
- 858 18 . The second Power of fuzzy sets is called -----
 (a)Concentration (b)Two values (c)difference (d)Dilation
- 859 19 . The square root of fuzzy sets is called -----
 (a)Concentration (b)Two values (c)difference (d)Dilation
- 860 20 . The complement of afuzzy set with a membership function $\mu_A(x)$
 (a) $1 - \mu_A(x)$ (b)1 (c)A (d)None
- 861 21 . The Crisp Relations as a prelude to -----
 (a)Fuzzy relations (b)Equal relations (c)Both a&b (d)None
- 862 22 . The Cartesian product of two sets A and B is denoted by -----
 (a)AX B (b) $A * B$ (c)AB (d)A-B
- 863 23 . The----- of two sets A and B is denoted by $A \times B$
 (a)Cartesian product (b)Fuzzy product (c)Crisp product (d)Both b&c
- 864 24 . Propositional logic recognizes-----major operators.
 (a)5 (b)2 (c)3 (d)4
- 865 25 . The value of $P \wedge (P \vee Q)$ is -----
 (a)Q (b)P (c) $P \wedge Q$ (d)None of these
- 866 26 . In predicate Logic the statement All men are Mortal written as-----
 (a) $\forall x(man(x) \Rightarrow mortal(x))$ (b) $\exists x(man(x) \Rightarrow mortal(x))$ (c) $\forall x(man(x) \Rightarrow \exists mortal(x))$ (d)None of these
- 867 27 . _____ operators requiring two propositions.
 (a)Unary (b)Binary (c)Both a&b (d)None
- 868 28 . _____ operators requiring single propositions
 (a)Unary (b)Binary (c)Both a&b (d)None
- 869 29 . A formula which has all its interpretations recording true is known as a-----
 (a)Tautology (b)Contradiction (c)Connective (d)None
- 870 30 . A formula which has all its interpretations recording false is known as a-----.

- (a)Tautology (b)Contradiction (c)Connective (d)None
871 31 . The-----of the logical connectives are explained using truth table.
- (a)Semantics (b)Meaning (c)Logic (d)Both a&b
872 32 . The reason being propositional logic lacks the ability to symbolize-----.
- (a)Tautology (b)Quantification (c)Connective (d)None
873 33 . _____ are symbols which indicates the two types of quantification.
- (a)Quantifiers (b)Semantics (c)Meaning (d)Logic
874 34 . _____ are representative of associative between objects that are Constants or Variables.
- (a)Predicates (b)Constants (c)Variables (d)Both a&c
875 35 . Predicates are representative of associative between objects that are_____.
- (a)Predicates (b)Constants (c)Variables (d)Both a&c
876 36 . _____ represent objects do not change the values.
- (a)Predicates (b)Constants (c)Variables (d)None
877 37 . A predicate carries a name representing the association followed by its _____representing the objects it is to associative
- (a)Arguments (b)Constants (c)Variables (d)Both a&c
878 38 . _____are symbols which represent values acquired by the objects as qualified by the quantifier with which they are associated with.
- (a)Predicates (b)Constants (c)Variables (d)Both b&c
879 39 . A _____carries a name representing the association followed by its argumentsrepresenting the objects it is to associative
- (a)Predicates (b)Constants (c)Variables (d)Both b&c
880 40 . $P \Rightarrow Q$ and P to be true , Q is true _____
- (a)Modus ponens (b)Modus tollens (c)chain rule (d)None
881 41 . $P \Rightarrow Q$ and $\sim Q$ to be true , $\sim P$ is true _____
- (a)Modus ponens (b)Modus tollens (c)chain rule (d)None
882 42 . $P \Rightarrow Q$ and $Q \Rightarrow R$ to be true, $P \Rightarrow R$ is true -----.
- (a)Modus ponens (b)Modus tollens (c)chain rule (d)None
883 43 . Various learning mechanisms exist to enable the _____acquire knowledge.
- (a)NW (b)NN (c)HWW (d)None
884 44 . The NN needs to remain _____to significant or useful information but remain stable when presented with irrelevant information
- (a)Stable (b)Bright (c)Plastic (d)None
885 45 . The NN needs to remain plastic to significant or useful information but remain _____ when presented with irrelevant information
- (a)Stable (b)Bright (c)plastic (d)None
886 46 . _____ is the one of the complicated things which, on the whole has been poorly understood
- (a)Leg (b)Hand (c)Human leg (d)None
887 47 . Brain contains about _____ basic units called neurons
- (a) 10^{10} (b)10 (c)20 (d)None
888 48 . Brain contains about 10^{10} basic units called _____.
- (a)Neural (b)Neurons (c)Brains (d)None
889 49 . Each neuron is turn is connected to about _____other neurons.
- (a) 10^4 (b) 10^8 (c)19 (d)5
890 50 . The weight of Neuron is _____
- (a) 1.9×10^{-6} (b) 1.8×10^4 (c) 1.5×10^{-9} (d)None
891 51 . A neuron is composed of a nucleus a cell body known as _____
- (a)Brain (b)Eyes (c)Skin (d)Soma
892 52 . Soma are long irregularly shaped filaments called _____
- (a)Soma (b)Dendrites (c)Neurons (d)None
893 53 . Internal electric of the potential of the cell known as _____
- (a)Soma (b)Dendrites (c)Neurons (d)Membrane
894 54 . A very commonly used Activation function is the _____
- (a)Transfer function (b)Squash function (c)Thresholding function (d)None
895 55 . The sum is compared with a threshold value
- (a)0 (b)1 (c) ∞ (d)0
896 56 . If the value is I is greater than θ then the output is _____
- (a)2 (b)5 (c)1 (d)7
897 57 . Φ is the step function known as _____
- (a)Transfer function (b)Squash function (c)Thresholding function (d)Heaviside function
898 58 . Signum function is also known as _____
- (a)Transfer function (b)Quantizer function (c)Thresholding function (d)Heaviside function
899 59 . Sigmoidal function is continuous function that varies gradually between the asymptotic values_____

- (a)1&2 (b)3&4 (c)0&1 (d)2&5
 900 60 . ANN structure can be represented using a _____
 (a)Graph (b)Indirect graph (c)Directed graph (d)None
 901 61 . _____ assume significance in neural network.
 (a)Graph (b)Indirect graph (c)Directed graph (d)None
 902 62 . The input neurons receive the _____
 (a)Input value (b)Output value (c)Input signals (d)0
 903 63 . The output neurons receive the _____
 (a)Input value (b)Output value (c)Input signals (d)0
 904 64 . The perceptron is a computational model of the retina of the _____
 (a)Skin (b)Eye (c)Ear (d)None
 905 65 . The _____ is a computational model of the retina of the eye
 (a)Neuron (b)Networks (c)Perceptron (d)None
 906 66 . The S unit comprising _____ photo detectors receives input images.
 (a)200 (b)400 (c)250 (d)333
 907 67 . If the input signals exceed a threshold then the photo detector outputs ____ else _____.
 (a)3&4 (b)5&0 (c)1&0 (d)4&7
 908 68 . The photo detectors are randomly connected to the _____.
 (a)Sensory unit (b)Association unit (c)Response unit (d)None
 909 69 . _____ unit comprises feature demons.
 (a)Sensory unit (b)Association unit (c)Response unit (d)None
 910 70 . _____ unit comprises recognizers or perceptrons
 (a)Sensory unit (b)Association unit (c)Response unit (d)None
 911 71 . _____ units is adjustable.
 (a)Sensory unit (b)Association unit (c)Response unit (d)None
 912 72 . The predicates examine the output of the _____ unit for specific features.
 (a)Sensory unit (b)Association unit (c)Response unit (d)None
 913 73 . A perceptron model with _____ inputs.
 (a)5 (b)4 (c)3 (d)2
 914 74 . In XOR truth table output is 0 & 0 then parity is _____
 (a)Even (b)Odd (c)Both (d)None
 915 75 . In XOR truth table output is 1 & 1 then parity is _____
 (a)Even (b)Odd (c)Both (d)None
 916 76 . The problem for the ANN is to classify the inputs as _____ parity
 (a)Even (b)Odd (c)Both (d)None
 917 77 . ADALINE makes uses of _____
 (a)Supervised learning (b)Un supervised learning (c)Reinforced learning (d)Hebbian learning
 918 78 . The learning rule adopted by _____ network.
 (a)ADALINE (b)MADALINE (c)NEURAL (d)None
 919 79 . _____ is a systematic method of training multilayer artificial neural networks.
 (a)Propagation (b)After propagation (c)Back propagation (d)None
 920 80 . The Expansion of ADALINE is
 (a)Adaptive Linear Neural Element Network (b)Adaptive Linear Neural Network (c)Adequate Linear Neural Element Network (d)None of these
 921 81 . Back propagation is a systematic method of training _____ neural networks.
 (a)Single layer (b)Multilayer artificial (c)Both (d)None
 922 82 . The three layer network with input layer having _____
 (a)m nodes (b)k nodes (c)l nodes (d)h nodes
 923 83 . The three layer network with hidden layer having _____
 (a)m nodes (b)k nodes (c)l nodes (d)h nodes
 924 84 . The three layer network with output layer having _____
 (a)m nodes (b)k nodes (c)l nodes (d)h nodes
 925 85 . The number of neurons in the hidden layer may be chosen to lie between _____
 (a)1&10 (b)2&30 (c)5&21 (d)1&21
 926 86 . The neural networks work better if input and outputs lie between _____
 (a)2-Apr (b)1-Jun (c)0-1 (d)2-Apr
 927 87 . The three layer network with _____ having 1 nodes
 (a)Output layer (b)Hidden layer (c)Input layer (d)None
 928 88 . The three layer network with _____ having m nodes
 (a)Output layer (b)Hidden layer (c)Input layer (d)None
 929 89 . The three layer network with _____ having n nodes
 (a)Output layer (b)Hidden layer (c)Input layer (d)None
 930 90 . The number of neurons in the _____ may be chosen to lie between 1 & 21

- (a)Output layer (b)Hidden layer (c)Input layer (d)None
 931 91 . The neural networks work better if _____ lie between 0-1
 (a)Output layer (b)Hidden layer (c)Input layer (d)None
 932 92 . A _____ model with 2 inputs.
 (a)Neural (b)Brain (c)Networks (d)Perceptron
 933 93 . In XOR truth table output is _____ then parity is even
 (a)0&0 (b)1&1 (c)Both (d)None
 934 94 . In XOR truth table output is _____ then parity is odd
 (a)0&0 (b)1&1 (c)Both (d)None
 935 95 . The problem for the _____ is to classify the inputs as even or odd parity
 (a)MMM (b)NNN (c)ANN (d)None
 936 96 . _____ makes uses of supervised learning
 (a)ADALINE (b)MADALINE (c)Reinforced (d)Hebbian
 937 97 . The _____ are randomly connected to the association unit.
 (a)Sensory unit (b)Photo detectors (c)Response unit (d)None
 938 98 . Association unit comprises _____ .
 (a)Sensory unit (b)Clarence (c)Response unit (d)Feature demons
 939 99 . Response unit comprises recognizers or _____ .
 (a)Perceptrons (b)Association unit (c)Response unit (d)None
 940 100 . The sigmoidal function takes the asymptotic values between
 (a)0 & 1 (b)-11 (c)Both (a) & (b) (d)None

Section -B

- 941 1 . Let the set A,B,C & E are given as follow: E = {all the student enrolled in university cricket club}, A = {male student} B = {bowlers} C = {bats man}. Draw the Venn diagram for
 i) Bowlers who are not batsman, ii. Female Students .
 942 2 . Explain properties of crisp set
 943 3 . Give the example of product of two fuzzy sets
 944 4 . Give the properties of fuzzy sets
 945 5 . Give examples of the power of fuzzy sets
 946 6 . Illustrate an example of fuzzy sets in the age group people young, middle aged ,old using membership function graph
 947 7 . Define difference of fuzzy sets give examples
 948 8 . Draw the Venn diagram $(A \cup B \cup C)' = A' \cap B' \cap C'$
 949 9 .
 Verify the disjunctive sum If $\tilde{A} = \{(x_1, 0.6), (x_2, 0.4), (x_3, 0)\}$, $\tilde{B} = \{(x_1, 0.2), (x_2, 0.3), (x_3, 0.5)\}$
 950 10 . Define fuzzy versus crisp?
 951 11 . Is $((P \Rightarrow Q) \wedge (Q \Rightarrow P)) = (P = Q)$ is a tautology?
 952 12 . Write predicate logic statement for, (i)Ram likes all kinds of food, (ii) Sita likes anything which Ram likes.
 953 13 . Discuss about crisp relations
 954 14 . Explain Laws of propositional logic?
 955 15 . Define max-min composition with example.
 956 16 . Define cartesian product in fuzzy set with examples.
 957 17 . Explain the following predicate logic ((a) Quantifiers (c) predicates.
 958 18 . Give an example of Fuzzy relations
 959 19 . Construct predicate logic statement for (i) Raj likes those which sita and Ram both like (ii) All likes some of which Ram likes
 960 20 . Show that $(P \Rightarrow Q) \equiv \sim(P \vee \sim Q)$ is a tautology.
 961 21 . Write briefly about signum functions?
 962 22 . Define sigmoidal functions?
 963 23 . Define hyperbolic tangent function?
 964 24 . Construct the network for multilayer feed forward?
 965 25 . Discuss the basic concepts in neural networks
 966 26 . Construct the network for single layer feed forward network
 967 27 . Write the classes in neural network architecture
 968 28 . Discuss about thresholding function
 969 29 . Write a brief note on artificial neuron
 970 30 . Write a note on i) neuron ii)action potential iii)afferent and efferent cell
 971 31 . Discriminate ADALINE network?
 972 32 . Explain XOR Problem?
 973 33 . Explain some application domains in neural networks to solve variety of problems ?
 974 34 . Explain fixed learning perceptron learning algorithm
 975 35 . construct the Rosenblatts perceptron networks
 976 36 . Construct MADALINE network

977 37 . Obtain the equation for unipolarsigmoidal and bipolar sigmoidal and its function form

978 38 . Discuss perceptron and linearly separable task

979 39 . Draw the Model for multilayer perception

980 40 . Explain Model for multilayer perception?

981 41 . Describe back propagation learning

982 42 . Construct the network for back propagation learning

983 43 . Explain input layer?

984 44 . Draw the diagram for output layer computation

985 45 . Draw the diagram for hidden layer computation

986 46 . Explain hidden layer computation?

987 47 . Explain output Layer Computation

988 48 . Discuss about effect of different learning rate coefficient

989 49 . Define constraint satisfaction?

990 50 . Define forecasting & risk assessment?

Section -C

991 1 . For the fuzzy sets `

\tilde{A}, \tilde{B} defined on the interval $[0, 5]$ of real numbers and the membership grade function $\mu_{\tilde{A}}(x) = \frac{x}{(x+1)}, \mu_{\tilde{B}}(x) = 2^{-x}$, determine the mathematical formulae and membership gr

$$(I) \tilde{A}^c, \tilde{B}^c \quad (II) \tilde{A} \cap \tilde{B} \quad (III) \tilde{A} \cup \tilde{B} \quad (IV) (\tilde{A} \cup \tilde{B})^c$$

992 2 . Given $|E| = 100$, where E indicates the set of students who have chosen subjects from different streams in the Computer Science discipline, it is found that 32 study Networks (CN) stream, 20 from Multimedia Technology (MMT) stream, and 45 from the system software (SS). Also 15 study subjects from both CN and SS streams, 7 from 10 from both CN and SS streams, 30 do not study any subjects chosen from either of the three streams. Find the number of students who subjects belonging to all three streams

993 3 . Explain and give example above basic fuzzy set operation

994 4 . Given $|E| = 600$ $|A| = 300$ $|B| = 225$ $|C| = 160$, also let the number of male students who are bowlers (AnB) be 10, 25 of whom are batsmen too (AnBnC) and the total batsmen (AnC) be 85. Determine the number of students who are i) Female ii) Not bowlers iii) not batsmen

995 5 . Give a brief note on membership?

996 6 . Recognise English alphabetical character (F,E,X,Y,T,I,T) in a image processing systems Define two fuzzy sets

$\tilde{I} = \{(F, 0.4), (E, 0.3), (X, 0.1), (Y, 0.2), (I, 0.9), (T, 0.9), (T, 0.8)\}$ $\tilde{F} = \{(F, 0.99), (E, 0.8), (X, 0.1), (Y, 0.2), (I, 0.5), (T, 0.5), \}$ Find (I) $\tilde{I} \cup \tilde{F}$ (II) $\tilde{I} - \tilde{F}$ (III) $(\tilde{I} \cup \tilde{F})^c = \tilde{I}^c \cap \tilde{F}^c$

997 7 . Explain the operations on Crisp sets with example.

998 8 . Define Partition and Covering of a set with example.

999 9 . Give a brief notes on basic fuzzy set operations

1000 10 . All the 3200 students of a college in a city know at least one of the three languages – Tamil, Telugu and Malayalam. 2400 know Tamil, 1700 know Telugu, 800 know Tamil and Telugu, 500 know Tamil and Malayalam, 300 know Telugu and Malayalam and only 100 know all those three languages. Draw a Venn diagram and find the number of Telugu but not Malayalam, 2. Who know only Malayalam, 3. Who know only one of the three languages and 4. Who know none of these languages?

1001 11 . Suppose $X = \{x_1, x_2, x_3\}$ $Y = \{y_1, y_2\}$ and $Z = \{z_1, z_2, z_3\}$ and \tilde{R} and \tilde{S} are the two fuzzy relations given by

$$X = \begin{matrix} & Y_1 & Y_2 \\ 0.5 & 0.1 \\ 0.2 & 0.9 \\ 0.8 & 0.6 \end{matrix} \quad Y = \begin{matrix} & Z_1 & Z_2 & Z_3 \\ 0.6 & 0.4 & 0.7 \\ 0.5 & 0.8 & 0.9 \end{matrix} \quad \text{Find } R \circ S$$

by max-min composition.

1002 12 . Given (i) Every soldier is strong-willed (ii) All who are strong-willed and sincere will succeed in their career (iii) Indira is a soldier (iv) Indira is sincere using it that Will Indira succeed in her career?

1003 13 . Analyze the operations on fuzzy relations

1004 14 . Explain inference in propositional logic

1005 15 . Explain operations on crisp sets relation

1006 16 . Explain the following predicate logic a) Quantifiers b) predicates. c) Variables d) constants e) functions

1007 17 . verify the Demargons laws using connectives by truth table

1008 18 . Discuss the laws of prepositional logic

1009 19 . Illustrate the example to show fuzzy relation between two sets

1010 20 . Consider $P = \{p_1, p_2, p_3, \}$ of four variety of paddy plants $D = \{D_1, D_2, D_3, \}$ of various diseases affecting the plants $S = \{S_1, S_2, S_3, \}$ be the common symptoms min composition.

$$R = P \begin{matrix} & D_1 & D_2 & D_3 \\ 0.6 & 0.9 & 0.8 \\ 0.1 & 0.2 & 0.9 \\ 0.9 & 0.4 & 0.8 \end{matrix}, S = D \begin{matrix} & S_1 & S_2 & S_3 \\ 0.1 & 0.2 & 0.8 \\ 1 & 1 & 0.6 \\ 0.9 & 1 & 0.8 \end{matrix}$$

1011 21 . Define neural networks?

1012 22 . Explain Neural Network Architectures and also write the types of classes?

1013 23 . Explain the physical structure of human brain.

1014 24 . Explain about model of artificial neuron?

1015 25 . Discuss about single layer feedforward network?

1016 26 . Explain multi layer feedforward network?

1017 27 . Dissect the classes of Neural Network

1018 28 . Write a brief note on Signum, sigmoidal function?

- 1019 29 . Explain about sigmoidal and Hyperbolic tangent function
- 1020 30 . Construct about singlelayer feed forward network & multilayer feedforward network
- 1021 31 . Explain the single layer Artificial Neural network
- 1022 32 . Explain Rosenblatt's perceptron
- 1023 33 . Explain perceptron model?
- 1024 34 . Explain MADALINE network?
- 1025 35 . Explain solution and typical nonlinear activation operators
- 1026 36 . Explain the model for multi layer perceptron
- 1027 37 . Give brief notes on early neural network architectures
- 1028 38 . illustrate the common application of neural networks.
- 1029 39 . Give brief notes for the solution of backpropagation networks.
- 1030 40 . Difference between single layer artificial neural network and model for multilayer perceptron.
- 1031 41 . Explain about Input Layer Computation
- 1032 42 . Give brief notes for output Layer Computation
- 1033 43 . Give brief notes for Hidden Layer Computation
- 1034 44 . Analyse the backpropagation learning algorithm?
- 1035 45 . Explain the calculation of error?
- 1036 46 . Difference between Input layer Computation and Output layer Computation.
- 1037 47 . Difference between Input layer Computation and Hidden layer Computation.
- 1038 48 . Difference between Output layer Computation and Hidden layer Computation.
- 1039 49 . Define: Control systems, Linier type, Hard limiter.
- 1040 50 . Explain: Unipolar sigmoidal, Bipolar Sigmoidal, Radial basis function