unit	question	option1	option2	option3	option4	answer
1	Core of soft Computing is	Fuzzy Computing, Neural Computing, Genetic Algorithms	Fuzzy Networks and Artificial Intelligence	Artificial Intelligence and Neural Science	Neural Science and Genetic Science	option1
1	Who initiated the idea of Soft Computing	Charles Darwin	Lofti A Zadeh	Rechenberg	Mc_Culloch	option2
1	Fuzzy Computing	mimics human behaviour	doesnt deal with 2 valued logic	deals with information which is vague, imprecise, uncertain, ambiguous, inexact, or probabilistic	All of the above	option4
1	Neural Computing	mimics human brain	information processing paradigm	Both (a) and (b)	None of the above	option3
1	Genetic Algorithm are a part of	Evolutionary Computing	inspired by Darwin's theory about evolution - "survival of the fittest"	are adaptive heuristic search algorithm based on the evolutionary ideas of natural selection and genetics	All of the above	option4
1	What are the 2 types of learning	Improvised and unimprovised	supervised and unsupervised	Layered and unlayered	None of the above	option2
1	Supervised Learning is	learning with the help of examples	learning without teacher	learning with the help of teacher	learning with computers as supervisor	option3
1	Unsupervised learning is	learning without computers	problem based learning	learning from environment	learning from teachers	option3
1	Conventional Artificial Intelligence is different from soft computing in the sense	Conventional Artificial Intelligence deal with prdicate logic where as soft computing deal with fuzzy logic	Conventional Artificial Intelligence methods are limited by symbols where as soft computing is based on empirical data	Both (a) and (b)	None of the above	option3
1	In supervised learning	classes are not predefined	classes are predefined	classes are not required	classification is not done	option2
1	ANN is composed of large number of highly interconnected processing elements(neurons) working in unison to solve problems	TRUE	FALSE			option1
1	Artificial neural network used for	Pattern Recognition	Classification	Clustering	All of these	option4
1	A Neural Network can answer	For Loop questions	what-if questions	IF-The-Else Analysis Questions	None of these	option2
1	In artificial Neural Network interconnected processing elements are called	nodes or neurons	weights	axons	Soma	option1
1	Neuron can send _____ signal at a time.	Multiple	One	Two	Three	option2
1	Any soft-computing methodology is characterized with	precise solutions	control actions are unambiguous and accurate	Control action is formally defined	algorithm which can easily adapt with the change of dynamic environment	option4
1	An equivalence between Fuzzy vs. Probability to that of Prediction vs. Forecasting is	Fuzzy=Prediction	Fuzzy= Forecasting	Probability=Forecasting	None of these	option2
1	Both fuzzy logic and artificial neural network are soft computing techniques because	Both gives precise and accurate results.	Artificial neural network gives accurate result, but fuzzy logic does not.	In each, no precise mathematical model of the problem is required	Fuzzy gives exact result but artificial neural network does not.	option3
1	Which of the following cannot be stated using fuzzy logic?	Color of an apple	Height of a person	Date of birth of a student	Speed of a car	option3
1	For the same size of training data as input, the fastest learning technique is	Supervised training with gradient descent error correction	Supervised training with stochastic method	Unsupervised training without error calculation	Unsupervised training with Hebbian method.	option1

1	In case of layer calculation, the maximum time involved in	Input layer computation.	Hidden layer computation.	Output layer computation.	Equal effort in each layer.	option4
1	In supervised learning, training set of data includes	Input	Output	Both input and output	None	option3
1	Both fuzzy logic and artificial neural network are soft computing techniques because,	Both gives precise and accurate results.	Artificial neural network gives accurate result but fuzzy logic does not.	In each, no precise mathematical model of the problem is required.	Fuzzy gives exact result but artificial neural network does not.	option3
1	Fuzzy – Genetic Hybrid system is a	Fuzzy logic in parallel with the Genetic algorithm	Fuzzy logic controlled Genetic algorithm	Genetic algorithm controlled Fuzzy logic	None of the above	option2
1	In which of the following, one technology calls the other technology as subroutine to process or manipulate information needed	Embedded hybrid system	Sequential hybrid system	Auxiliary hybrid system	Parallel hybrid system	option3
1	Which of the following is not a hybrid system?	Embedded hybrid system	Sequential hybrid system	Auxiliary hybrid system	Parallel hybrid system	option4
1	Command to start matlab fuzzy toolbox is	fis	fuzzy	fuzzybox	fuzzytool	option2
1	Training Perceptron is based on	Supervised learning technique.	Unsupervised learning	Reinforced learning	Stochastic learning	option1
1	A batch mode of training is generally implemented through the _____ in error calculation	Minimization of median square error	Maximization of median square error	Maximization of mean square error	Minimization of mean square error	option4
1	_____ is/are the way/s to represent uncertainty.	Fuzzy Logic	Probabilty	Entropy	All of the mentioned	option1
1	An artificial neurons receives n inputs x1, x2,...,xn with weights w1,w2,...,wn attached to the input links. The weighted sum ..... is computed to be passed on to a non-linear filter ø calledactivation function to release the output.	Σ wi	Σ xi	Σ xi+Σ wi	Σ xi.Σwi	option4
1	Who invented the Single-Layer Perceptron?	Frank Rosenblatt	Marvin Minsky	Seymour Papert	None of these	option1
1	Japanese were the first to utilize fuzzy logic practically on high-speed trains in Sendai.	True	False			option1
1	Which AI system provides a diagnosis to a specific problem?	Intelligent agent	Geographical information system	Data mining system	Expertsystem	option2
1	Why are linearly separable problems of interest to neural network researchers?	Because they are the only class of problems that a network can solve sucessfully	Because they are the only mathematical functions that are continuous	Because they are the only mathematical functions you can draw	Because they are the only class of problems a perceptron can solve successfully	option2
1	Where is the minimum criterion used ?	When there is an AND operation	When there is an OR operation	In De-Morgan's theorem	None of these	option1
1	Perceptron learning, Delta learning and LMS learning are learning methods which falls under the category of	Error correction learning - learning with a teacher	Reinforcement learning - learning with a critic	Hebbian learning	Competitive learning - learning without a teacher	option1
1	Generally, AI systems analyze imprecise and subjective information. This information is called	Blurred data	Fuzzy logic	Inclusive information	Dirty data	option3
1	Which AI system will work for you to find information on the internet?	Intelligent agent	Neural Network	Genetic Algorithms	Expertsystem	option3
1	Which AI system will continue to analyze a problem until it finds the best solution?	Intelligent agent	Neural Network	Genetic Algorithms	Expertsystem	option4
1	Which Intelligent Agent will monitor systems and report back to you when there is a problem?	Shopping bot	Buyer agent	Information agent	Predictive agent	option1
1	Which Intelligent Agent can play an Internet game on your behalf?	Information agent	User agent	Predictive agen	Game agent	option2
1	In terms of computing we have	antecedent	consequent	mapping function	All of the mentioned	option4
1	Example of hard computing	Robot movement	Hand written character recognition	money allocation	searching problem	option4
1	Hard computing produce	precise solutions	fuzzy solution	approximate solution	None of these	option1
1	Hard computing is strictly	Parallel	sequential	Both	None of these	option2
1	Principle compunent of soft computing is	Neural Network	Fuzzy Loguc	Genetic Algorithms	All of the mentioned	option4
1	Which is supervised learning	clustering	regression	association	dimensionality reduction	option2
1	Example of hybrid system is	Auxillary	Embedde	Neuro Fuzzy	Neuro Gastro	option3
1	Soft computing is NOT	allows stochasticity	deterministic	allows parallel computation	tolerant of imprecision	option2
2	Fuzzy logic is a form of	Two valued logic	Many valued logic	Crisp set logic	Binary set logic	option2

2	Traditional set theory is also known as Crisp set theory.	True	False			option1
2	A fuzzy set A is closed if:	$\lim x \to -\infty \mu(x) = 1$ and $\lim x \to +\infty (x) =$	$\lim x \to -\infty \mu(x) = \lim x \to +\infty (x) = 0$	$\lim x \to -\infty \mu(x) = 0$ and $\lim x \to +\infty (x) = 1$	$\lim x \to -\infty \mu(x) = \lim x \to +\infty (x) = 1$	option2
2	How is Fuzzy Logic different from conventional control methods?	IF and THEN Approach	FOR Approach	WHILE Approach	DO Approach	option1
2	The height h(A) of a fuzzy set A is defined as h(A) =sup A(x) where x belongs to A. Then the fuzzy set A is called normal when	h(A)=0	h(A)<0	h(A)=1	h(A)>1	option3
2	For k>1, which of the following concept can be used to generate other linguistic hedge	Concentration and Dilation	Dilation	Concentration	None of the above	option3
2	The membership functions are generally represented in	Tabular Form	Graphical Form	Mathematical Form	Logical Form	option2
2	Three main basic features involved in characterizing membership function are	Intution, Inference, Rank Ordering	Fuzzy Algorithm, Neural network, Genetic Algorithm	Core, Support , Boundary	Weighted Average, center of Sums, Median	option3
2	Membership function defines the fuzziness in a fuzzy set irrespective of the elements in the set, which are discrete or continuous.	True	False			option1
2	Membership function can be thought of as a technique to solve empirical problems on the basis of	knowledge	examples	learning	experience	option4
2	The region of universe that is characterized by complete membership in the set is called	Core	Support	Boundary	Fuzzy	option1
2	A fuzzy set whose membership function has at least one element x in the universe whose membership value is unity is called	sub normal fuzzy sets	normal fuzzy set	convex fuzzy set	concave fuzzy set	option2
2	In a Fuzzy set a prototypical element has a value	1	0	Infinite	Not Defined	option1
2	A fuzzy set whose membership function has no members whose membership value is 1	sub normal fuzzy sets	normal fuzzy set	convex fuzzy set	concave fuzzy set	option1
2	A fuzzy set has a membership function whose membership values are strictly monotonically increasing or strictly monotonically decreasing or strictly monotonically increasing than strictly monotonically decreasing with increasing values for elements in the universe	sub normal fuzzy sets	normal fuzzy set	convex fuzzy set	concave fuzzy set	option3
2	The membership values of the membership function are nor strictly monotonically increasing or decreasing or strictly monoronically increasing than decreasing.	convex fuzzy set	concave fuzzy set	non convex fuzzy set	non concave fuzzy set	option3
2	The crossover points of a membership function are defined as the elements in the universe for which a particular fuzzy set has values equal to	infinite	1	0	0.5	option4
2	If *if x ia A then y is B else y is C* . The output of the given fuzzy rule is	a fuzzy set	a crisp set	a fuzzy relation	a membership function	option3
2	The cardinality of the given set A={1,2,3,4,5}	4	5	2	3	option2
2	The cardinality of the fuzzy sets defined with continuous membership function on any universe is	infinity	0	1	-1	option1
2	Two fuzzy sets A and B with membership functions μA(x)and μB(x), respectively defined as below. A = Hot Climate with μA (x) as the MF B = Cold Climate with μB(x)as the MF Pleasant climate is given by	$1 - \mu B(x)$	$\max(\mu A(x), \mu B(x))$	$\min(\mu A(x), \mu B(x))$	$1 - \mu A(x)$	option3
2	What is the Bandwidth of fuzzy set A which is given as follow A ={ (10, 0.1), (15, 0.2), (20, 0.5), (25, 0.4), (30, 0.4), (35, 0.5), (40, 0.2), (45, 0.1) }	10	15	20	25	option2
2	Given that " x is Sweet " with T(x) = 0.8 and" y is Sweet " with T(y) = 0.6.The fuzzy truth value of "If x is Sweet then y is Sweet " is:	0.2	0.4	0.6	0.8	option4
2	$(\sim (P \wedge Q) \Rightarrow R) \wedge P \wedge Q$ is equivalent to	$(P \wedge Q)$	$(P \wedge Q)VR$	P	$(\sim P \vee Q)$	option1
2	If *if x ia A then y is B else y is C* . Then relation is eqivalent to	$(A \times B) + (B \times C)$	$(A \times B) \cup (A^{-} \times C)$	$(A \times B) \rightarrow (B \times C)$	$(A \times C) \cup (B \times C)$	option2
2	What are the applications of Fuzzy Inference Systems?	Wireless services, heat control and printers	Restrict power usage, telephone lines and sort data	Simulink, boiler and CD recording	Automatic control, decision analysis and data classification	option4
2	Let X = {a, b, c, d} and Y = {1, 2, 3, 4} and A = {(a, 0.0), (b, 0.8), (c, 0.6), (d, 1.0)}, B = {(1, 0.2), (2, 1.0), (3, 0.8), (4, 0.0)}, C = {(1, 0.0), (2, 0.4), (3, 1.0), (4, 0.8)}. Determine the implication relation: If x is A then y is B	0 0 0 0 0.2 0.8 0.8 0 0.2 0.6 0.6 0 0.2 1 0.8 0	1 1 1 1 0.2 0.8 0.8 0.2 0.4 0.6 0.6 0.4 0.2 0.1 0.8 0	0 0.4 1 0.8 0.2 0.8 0.8 0.2 0.2 0.6 0.6 0.4 0.2 1 0.8 0	0 0.4 1 0.8 0 0.2 0.2 0.2 0 0.4 0.4 0.4 0 0 0 0	option2

2	what are the following sequence of steps taken in designing a fuzzy logic machine?	Fuzzification -> Rule Evaluation --> Defuzzification	Rule Evaluation --> Fuzzification -> Defuzzification	Defuzzification--> Rule Evaluation --> Fuzzification	Fuzzy Sets--> Defuzzification--> Rule Evaluation	option1
2	Fuzzy logic is usually represented as	IF-THEN-ELSE rules	IF-THEN rules	Both IF-THEN-ELSE rules & IF-THEN rules	None of the mentioned	option2
2	Which of the following is not true regarding the principles of fuzzy logic ?	Fuzzy logic follows the principle of Aristotle and Buddha	Japan is currently the most active users of fuzzy logic	Fuzzy logic is a concept of 'certain degree'	Boolean logic is a subset of fuzzy logic	option1
2	The room temperature is hot. Here the hot (use of linguistic variable is used) can be represented by _____	Fuzzy Set	Crisp Set	Fuzzy & Crisp Set	None of these	option1
2	Considering a graphical representation of the 'tallness' of people using its appropriate member function, which of the following combinations are true ? (I)TALL is usually the fuzzy subset. (II) HEIGHT is usually the fuzzy set. (III) PEOPLE is usually the universe of discourse	I,II,III	I,II	I,III	II,III	option1
2	What is the Fuzzy Approximation Theorem(FAT) ?	A fuzzy sytem can model any continoussytem	The conversion of fuzzy logic to probability.	A continoussytem can model a fuzzy system	Fuzzy patches covering a series of fuzzy rules	option2
2	What is the main difference between probability and fuzzy logic	Fuzzy logic is probability in disguise	Fuzzy logic is the likelihood of an event occuring and probablility is the extent of that event	Probability is ADDITIVE, meaning all its values must add up to one	Probability dissipates with decreasing information	option1
2	Fuzzy Set theory defines fuzzy operators. Choose the fuzzy operators from the following.	AND	OR	NOT	All of the mentioned	option4
2	There are also other operators, more linguistic in nature, called _____ that can be applied to fuzzy set theory.	Hedges	Lingual Variable	Fuzzy Variable	None of the mentioned	option1
2	Consider a fuzzy set A defined on the interval X = [0, 10] of integers by the membership Junction μA(x) = x / (x+2) Then the α cut corresponding to α = 0.5 will be	{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}	{1, 2, 3, 4, 5, 6, 7, 8, 9, 10}	{2, 3, 4, 5, 6, 7, 8, 9, 10}	None of these	option3
2	If A and B are two fuzzy sets with membership functions: μa(χ) ={0.2,0.5.,0.6,0.1,0.9} μb (χ)= {0.1,0.5,0.2,0.7,0.8} then the value of μa ∩ μb will be	{0.2,0.5,0.6,0.7,0.9}	{0.2, 0.5,0.2, 0.1,0.8}	{0.1, 0.5, 0.6, 0.1,0.8}	{0.1, 0.5, 0.2, 0.1,0.8}	option4
2	A _____ point of a fuzzy set A is a point x ∈ X at which μA(x) = 0.5	Core	Support	Cross-over	None of these	option3
2	Given U = {1,2,3,4,5,6,7} A = {(3, 0.7), (5, 1), (6, 0.8)} then A~ will be: (where ~ → complement)	{(4, 0.7), (2,1), (1,0.8)}	{(4, 0.3.): (5, 0), (6. 0.2) }	{(l, 1), (2, 1), (3, 0.3), (4, 1), (6,0.2), (7, 1)}	{(3, 0.3), (6.0.2)}	option3
2	In Lamda-cut method the value of λ can be	Greater than 10	Between 1 and 10	Between 0 and 1	Any value	option3
2	Suppose, a fuzzy set Young is defined as follows Young = (10, 0.5), (20, 0.8), (30, 0.8), (40, 0.5), (50, 0.3) Then the crisp value of Young using MoM method is	20	25	30	35	option2
2	If the fuzzy set has two sub regions, then the centre of gravity of the sub region _____ can be used to calculate the defuzzified value.	with the median of all the area	with the mean of all the area	with the largest area	with the smallest area	option3
2	Which of the following is not a centroid method?	Centre of gravity method (CoG)	Centre of sum method (CoS)	Centre of area method (CoA)	Centre of Mass (CoM)	option4
2	Let A be a fuzzy set. Then 1-cut of A is usually called	support	height	core	alpha-cut	option3
2	Each fuzzy complement has at most ------equilibrium.	1	2	3	None of these	option1
2	Equilibrium of a fuzzy complement c is a solution of the equation	c(a)-a=1	c(a)-a=2	c(a)=2a	c(a)-a=0	option4
2	Defuzzification is done to obtain	Crisp output	Fuzzy Output	The best rule to follow	None of these	option1
2	If Z is a set of elements with a generic element z, i.e. Z = {z}, then this set is called _____	Universe set	Universe of discourse	Derived set	None of these	option2
2	A fuzzy convexity is set	increasing	decreasing	increasing and then decreasing	All of the mentioned	option4

3	Fuzzy logic is :	Used to respond to questions in a humanlike way	A new programming language used to program animation	c) The result of fuzzy thinking	d) A term that indicates logical values greater than one	option1
3	What Is Fuzzy Inference Systems?	The process of formulating the mapping from a given input to an output using fuzzy logic	The process of formulating the mapping from a given input to an output using fuzzy logic	Having a larger output than the input	Having a smaller output than the input	option1
3	What Are The Two Types Of Fuzzy Inference Systems?	Model-Type and System-Type	Momfred-Type and Semigi-Type	Mamdani-Type and Sugeno-Type	Mihni-Type and Sujgani-Type	option3
3	Where Has Fuzzy Inference Systems Been Implemented?	Wireless services, heat control and printers	Wireless services, heat control and printers	Simulink, boiler and CD recording	Automatic control, decision analysis and data classification	option4
3	What Is Another Name For Fuzzy Inference Systems?	Fuzzy Expert System	Fuzzy Modelling	Fuzzy Logic Controller	All of the mentioned	option4
3	Mamdani's Fuzzy Inference Method Was Designed To Attempt What?	Control any two combinations of any two products by synthesising a set of linguistic control rules obtained from experienced human operations.	Control a television and remote combination by synthesising a set of linguistic control rules obtained from experienced human operations.	Control a steam engine and a boiler combination by synthesising a set of linguistic control rules obtained from experienced human operations	Control a air craft and feul level combination by synthesising a set of linguistic control rules obtained from experienced human operations	option3
3	What Is The First Step Of Fuzzy Logic Toolbox?	Fuzzification of the input variables	Defuzzification	Application of the fuzzy operator (AND or OR) in the antecedent	Aggregation of the consequents across the rules	option1
3	What Is The Input And Output Of Step 2 - Apply Fuzzy Operator?	The input is a single truth value and the output has two or more values	The input is a value greater than one and the output is a value less than the input	The input and output have both the same values	The input has two or more values and the output has a single truth value	option4
3	What Is The Equation For Probabilistic?	Probor (a,b) = a-b + ab	Probor (a,b) = ab + ab	Probor (a,b) = a+b - ab	Probor (a,b) = a/b x ab	option3
3	What Is The Input And Output Of Step 3 - Apply Implication Method?	Input is a fuzzy set but the output is a whole value	Input is a whole value but the output can be a fuzzy set	Input and output have the same value	Input is a smaller value than the output value	option2
3	What Is The Purpose Of Aggregation?	To gather all the different fuzzy set outputs and combine them into a single fuzzy set outputs	To gather all the possible inputs and use the average to gain an output	To gather all the different fuzzy set outputs and average them out to get a single value	To subtract all the output fuzzy set values from the input values	option1
3	Generalizations of ordinary fuzzy sets which involve fuzzy sets defined within a universal set whose elements are ordinary fuzzy sets constitute a --------fuzzy set	Level 1	Level 2	Level 3	Level 4	option2
3	Example of an idempotent t-norm is	Algebraic Product	Bounded Difference	Drastic intersection	Standard intersection	option4
3	One difference between Mamdani approach and Takagi-Sugeno approach to FLC design is that	Mamdani approach needs defuzzification module whereas Takagi-Sugeno approach does not	Takagi-Sugeno approach does not require any fuzzification module whereas Mamdani approach needs	Takagi-Sugeno approach is more interpretable but less accurate	All of the mentioned	option1
3	Takugi-Sugeno approach to FLC design is computationally more expensive compared to Mamdani approach because	Mamdani approach considers a less number of rules in fuzzy rule base	Searching a rule in Mamdani approach is simple and hence less time consuming	Takagi-Sugeno approach consider a large number of rules in fuzzy rule base	Computation of each rule in Takagi-Sugeno approach is more time consuming	option4
3	“The train is running fast”. Here ‘fast’ can be represented by	Fuzzy Set	Crisp Set	Fuzzy & Crisp Set	None of these	option1
3	_____ is/are the way/s to represent uncertainty.	Fuzzy Logic	Probabilty	Entropy	All of the mentioned	option4

3	An expert system differs from a database program in that only an expert system:	contains declarative knowledge	contains procedural knowledge	features the retrieval of stored information	expects users to draw their own conclusions	option2
3	_____ is the process of formulating the mapping from a given input to an output using Fuzzy logic.	FIZ	FIS	FOZ	None of these	option2
3	Which of the following is a type of Membership function?	Triangular	Trapezoidal	Sigmoid	All of the above	option4
3	Which of the following is not a type of Membership function?	S-shape	Bell shape	Truncated Gaussian	None of these	option4
3	What is the independent variable of fuzzy output?	Maturity	Membership	Generic Element	None of these	option1
3	Gausian MF is specified by _____ parameters	1	2	3	4	option2
3	Cauchy MF is	Gausian MF	Triangular MF	Generalised Bell MF	Trapezoidal MF	option3
3	= {(1, 0.5), (2, 0.1), (3, 0.4)} and =_ {(1, 0.2), (2, 0.3), (3, 0.5)}, find AUB	{(1, 0.2), (2, 0.1), (3, 0.4)}	{(1, 0.5), (2, 0.3), (3, 0.5)}	{(1, 0.5),(2, 0.9),(3, 0.6)}	{(x1,0.1),(x2,0.03),(x3,0.20)}	option2
3	= {(1, 0.5), (2, 0.1), (3, 0.4)} and =_ {(1, 0.2), (2, 0.3), (3, 0.5)}, find A∩B	{(1, 0.2), (2, 0.1), (3, 0.4)}	{(1, 0.5), (2, 0.3), (3, 0.5)}	{(1, 0.5),(2, 0.9),(3, 0.6)}	{(x1,0.1),(x2,0.03),(x3,0.20)}	option1
3	= {(1, 0.5), (2, 0.1), (3, 0.4)} and =_ {(1, 0.2), (2, 0.3), (3, 0.5)}, find A complement	{(1, 0.2), (2, 0.1), (3, 0.4)}	{(1, 0.5), (2, 0.3), (3, 0.5)}	{(1, 0.5),(2, 0.9),(3, 0.6)}	{(x1,0.1),(x2,0.03),(x3,0.20)}	option3
3	= {(1, 0.5), (2, 0.1), (3, 0.4)} and =_ {(1, 0.2), (2, 0.3), (3, 0.5)}, find A.B	{(1, 0.2), (2, 0.1), (3, 0.4)}	{(1, 0.5), (2, 0.3), (3, 0.5)}	{(1, 0.5),(2, 0.9),(3, 0.6)}	{(x1,0.1),(x2,0.03),(x3,0.20)}	option4
3	Methods of fuzzy approximate reasoning are	Syllogistic	Categorical	Dispositional	All of the mentioned	option4
3	Which fuzzy approximate reasoning uses "usually"	Syllogistic	Categorical	Dispositional	Qualitative	option3
3	Like relational databases there does exists fuzzy relational databases	True	False			option1
3	In this mode of approximate reasoning, the antecedents, containing no fuzzy quantifiers and fuzzy probabilities	Syllogistic	Categorical	Dispositional	Qualitative	option2
3	In this mode of approximate reasoning, the antecedents and consequents have fuzzy linguistic variables	Syllogistic	Categorical	Dispositional	Qualitative	option4
3	In this mode of approximation reasoning, antecedents with fuzzy quantifiers are related to inference rules	Syllogistic	Categorical	Dispositional	Qualitative	option1
3	Method of aggregation of fuzzy rule	Conjuctive system of rules	DISjuctive system of rules	Both	None of these	option3
3	Fuzzy Expert system does NOT consist of	Knowledge base	User Interface	Inference Engine	None of these	option4
3	If P:Mary is efficient, Q: Ram is efficient, T(P)=0.8, T(Q)=0.6 find value of Mary is not efficient	0.2	0.4	0.6	0.8	option1
3	If P:Mary is efficient, Q: Ram is efficient, T(P)=0.8, T(Q)=0.6 find value of Mary is efficient and so is Ram.	0.2	0.4	0.6	0.8	option3
3	If P:Mary is efficient, Q: Ram is efficient, T(P)=0.8, T(Q)=0.6 find value of Either Mary or Ram is efficient	0.2	0.4	0.6	0.8	option4
3	If P:Mary is efficient, Q: Ram is efficient, T(P)=0.8, T(Q)=0.6 find value of If Mary is efficient then so is Ram.	0.2	0.4	0.6	0.8	option3
3	Fuzzy Implication is also known as	Fuzzy logic	Fuzzy IF-THEN rule	Fuzzy expert system	None of these	option2
3	Ways to compute fuzzy rule A-> B is	A coupled with B	A entails B	Both	None of these	option3
3	R=(AXB)U(ÃXY) is	Zadeh's Max Product rule for *If x is A then y is B* else y is C	Zadeh's Max Min rule for *If x is A then y is B*	Zadeh's Max Product rule for *If x is A then y is B* else y is C	Zadeh's Max Min rule for *If x is A then y is B*	option4
3	System is used foe both MISO and MIMO	Mamdani	Sugeno	Takagi	None of these	option1
3	Which method is good for embedding linear controller	Mamdani	Sugeno	Takagi	None of these	option2
3	Suppose, a fuzzy set Young is defined as follows Young = (10, 0.5), (20, 0.8), (30, 0.8), (40, 0.5), (50, 0.3) Then the crisp value of Young using LoM method is	20	25	30	35	option3
3	Suppose, a fuzzy set Young is defined as follows Young = (10, 0.5), (20, 0.8), (30, 0.8), (40, 0.5), (50, 0.3) Then the crisp value of Young using FoM method is	20	25	30	35	option1
3	Which method counts overlapping area twice	CoS	CoG	CoA	LoM	option1
3	Which is not the diffuzzification metghod	Centre of gravity method	Centre of sum method	Centre of perimeter method	Centre of area method	option3
3	Which of this is not a fuzzy controller	Domestic Shower Controller	Water purifier controller	Train brake power controller	Angular JS Controller	option4
4	In Evolutionary algorithm____ operator is prime operator	selection	mutation	recombination	initialization	option2
4	In evolutionary algorithm selection is _____	deterministic	probabilistic	both	None of these	option1
4	Evolutionary Algorithm deals with self adaptation	Yes	No			option1

4	Problem domain of Evolutionary Algorithm is	discrete optimization	continuous optimization	combinatorial optimization	None of these	option2
4	Evolutionary Algorithm solves_____ problem	NP-complete	NP-hard	P	None of these	option2
4	Sequence of steps in EA	initialization-> selection->mutation->crossover->termination	initialization-> selection->crossover->termination	initialization-> selection->crossover->mutation->termination	None of these	option3
4	Which of the following MOEA algorithm is based on the concept of “elitism”?	MOGA	NPGA	NSGA	NSGA-II	option4
4	Which of the following solution is non-Pareto based a posteriori technique?	SOEA	MOGA	VEGA	Lexicographic ordering	option3
4	A three-objective optimizations are solved using a MOEA algorithm and a few objective vectors are listed below. (Assume all objectives are to be minimized) [3,5,10], [5,3,10], [3,10,5], [10,5,3], [10,3,5]. Which of the following is true?	All are non-dominating solutions	Solution [3,5,10] dominates all other solution	Solution [10,5,3] dominated by the solution [3,5,10]	Solution [3,10,5] dominates solution [5,3,10]	option1
4	Which of the following Pareto-based techniques to solve a MOOP follows “ranking” followed by "fitness averaging"	MOGA	NPGA	NSGA	NSGA-II	option1
4	Which of the following MOEA techniques follows Tournament selection strategy?	MOGA	NPGA	NSGA	NSGA-II	option2
4	Niche counts of two solutions x1 and x2 are 10, 20. This means that	x1 is surrounded by more neighbors than that of X2	x1 is surrounded by less neighbors than that of X2	x1 would be less desirable to provide population diversity .	x1 would be more desirable to provide population diversity .	option2
4	Which of the following statement is not correct?	A set of solutions is called trade-off solutions, which lie on the Pareto optimal front.	A solution is called a trade-off solution, if it is not dominated by any other solution in the solution space	A front is called Pareto-optimal front on which all optimal solutions lie.	A front containing a non-dominated set of solutions obtained over an exhaustive search space is called pareto optimal front	option3
4	In the following, only one statement is correct. Select the correct statement.	Stochastic selection with remainder supports low selection pressure.	Crowding tournament selection scheme supports low population diversity.	There is no selection scheme in NPGA.	In MOGA, Rank based selection can be applied to select parent chromosome for mating pool creation	option4
4	Select the wrong statement	MOGA uses the concept of ranking whereas NSGA uses the concept of niching to assign fitness values to parent chromosomes.	MOGA assigns different fitness values to all solution with the same rank whereas NSGA assigns the same fitness value to all solutions belonging to the same front.	MOGA assigns the same fitness values to all solution with the same rank whereas NSGA assigns different fitness value to all solutions belonging to the same front.	NSGA yields more accurate Pareto front than MOGA.	option3
4	To create mating pool, NSGA follows	Stochastic remainder selection	Crowding Tournament selection	Roulette wheel selection	Canonical Selection	option1
4	A similarity between NPGA and NSGA is that	Both are based on the concept of ranking.	Both assign fitness values to the parent chromosomes prior to their selection for mating pool.	Both calculates niched count to maintain population diversity.	Both are computationally very expensive.	option3
4	Ifc1 and c2 are two offspring chromosomes, then according to NPGA, c1 will be preferable to be selected for mating pool if	if c1’s niche count is higher than that of c2.	if c1’s niche count is equal to that of c2.	if c1’s niche count is less than that of c2.	None of these	option3
4	A priori high level information that is required in “Lexicographic ordering” is	the scalar weights of each objective function.	the descending ordering of the rank of the importance of objective functions.	independent of objective function.	None of these	option2

4	A solution xi is said to dominate another solution xj if	xj is worse than xi and xi is strictly better than xj.	xj is no worse than xi and xi is strictly better than xj in at least one objective.	xj is no worse than xi and xi is lesser than xj in at least one objective.	xj is worse than xi and xi is lesser than xj in at least one objective.	option2
4	Motivation for EA is	Mathematical based properties	Natural selection	Gradient properties	None of these	option2
4	compared to Traditional approach EA takes _____ CPU time	Large	Small	Equal	None of these	option1
4	Genetic Algorithm is superset of Evolutionary Algorithm	True	False			option2
4	Optimization in GA is	Metaheuristic	Stochastic	Discreate	Continuous	option3
4	In GA individual memory is there	Yes	No			option2
4	In GA individual operatior is	Crossover point	Mutation	pbest	gbest	option2
4	Encoding is	possible solutions of a problem are considered as individuals in a population	represents the main requirements of the desired solution of a problem	operator defines the way individuals in the current population are selected for reproduction	operator defines how chromosomes of parents are mixed in order to obtain genetic codes of their offspring	option1
4	Fitness function is	possible solutions of a problem are considered as individuals in a population	represents the main requirements of the desired solution of a problem	operator defines the way individuals in the current population are selected for reproduction	operator defines how chromosomes of parents are mixed in order to obtain genetic codes of their offspring	option2
4	Selection is	possible solutions of a problem are considered as individuals in a population	represents the main requirements of the desired solution of a problem	operator defines the way individuals in the current population are selected for reproduction	operator defines how chromosomes of parents are mixed in order to obtain genetic codes of their offspring	option3
4	Crossover is	possible solutions of a problem are considered as individuals in a population	represents the main requirements of the desired solution of a problem	operator defines the way individuals in the current population are selected for reproduction	operator defines how chromosomes of parents are mixed in order to obtain genetic codes of their offspring	option4
4	Mutation is	possible solutions of a problem are considered as individuals in a population	represents the main requirements of the desired solution of a problem	operator defines the way individuals in the current population are selected for reproduction	operator creates random changes in genetic codes of the offspring	option4
4	How many genes will be used in a chromosome of each individual if the number of cities is 10?	5	10	100	4	option2
4	How many genes will be in the alphabet of the algorithm?	n*(n-1)/2	n*(n+1)/2	n*(n-2)/2	n*(n+2)/2	option1
4	Suppose a genetic algorithm uses chromosomes of the form x = abcdefgh with a fixed length of eight genes. Each gene can be any digit between 0 and 9. Let the fitness of individual x be calculated as: f(x) = (a + b) − (c + d) + (e + f) − (g + h) , and let the initial population consist of four individuals with the following chromosomes: x1 = 6 5 4 1 3 5 3 2 x2 = 8 7 1 2 6 6 0 1 x3 = 2 3 9 2 1 2 8 5 x4 = 4 1 8 5 2 0 9 4 arrange chromosomes in order with the fittest first and the least fit last.	x1 ,x2,x3,x4	x2,x1,x3,x4	x1,x3,x4,x2	x2,x3,x1,x4	option2
4	one–point crossover at the middle point on x2 = 8 7 1 2 6 6 0 1 x1 = 6 5 4 1 3 5 3 2 will generate	O1 = 3 5 3 2 8 7 1 2 O2 = 6 6 0 1 6 5 4 1	O1 = 3 5 3 2 8 7 2 1 O2 = 6 6 0 1 6 5 1 4	O1 = 8 7 1 2 3 5 3 2 O2 = 6 5 4 1 6 6 0 1	O1 = 8 7 1 2 3 5 2 3 O2 = 6 5 4 1 6 6 1 0	option3
4	A budget ariline company operates 3 plains and employs 5 cabin crews. Only one crew can operate on any plain on a single day, and each crew cannot work for more than two days in a row. The company uses all planes every day. A Genetic Algorithm is used to work out the best combination of crews on any particular day. What is alphabet size in it?	3	5	8	15	option2

4	In _____ individuals are represented as a Finite State Machine	EP	ES	GA	PSO	option1
4	In _____ individuals are represented as a Real valued vector	EP	ES	GA	PSO	option2
4	In _____ individuals are represented as a binary string	EP	ES	GA	PSO	option3
4	Parent selection in ____ is stochastic using tournament	EP	ES	GA	PSO	option1
4	Parent selection in ____ is deterministic	EP	ES	GA	PSO	option2
4	Parent selection in ____ is either stochastic or deterministic	EP	ES	GA	PSO	option3
4	_____does not use recombination to produce offspring.	EP	ES	GA	PSO	option1
4	_____ uses crossover to produce offspring.	EP	ES	GA	PSO	option2
4	_____ uses various recombination operators.	EP	ES	GA	PSO	option3
4	Is it advisable to apply genetic algorithm for all kinds of optimization problem	Yes	No			option2
4	In _____ each individual survives for exactly one generation	Generation Model	Steady state Model	Population Model	Tournament Model	option1
4	Category of EP based on scaling function	Non adaptive	Non Dynamic	Non self-adaptive	Adaptive	option1
4	Evolutionary algorithm differes from genetic algorithm as it does not have	Crossover	mutation	Selection	Reproduction	option1
4	Evolutionary algorithms classified as	Evolutionary Programming	Evolutionary Strategies	Genetic Algorithms	All of the mentioned	option4
5	In the choice phase of problem solving, normative models involve selecting an optimal or best outcome	True	False			option1
5	Analytical techniques for problem solving are best for unstructured rather than structured problems.	True	False			option2
5	Heuristic approaches are typically used to solve more complex problems.	True	False			option1
5	Genetic algorithms are heuristic methods that do not guarantee an optimal solution to a problem	True	False			option1
5	A "what-if" model is most typically used for the most structured problems	True	False			option2
5	The use of simulation models is desirable because they can usually be solved in one pass, without incurring the time and cost of iterations	True	False			option2
5	An advantage of simulation is that it allows model builders to solve problems with minimal interaction with users or managers	True	False			option2
5	Time compression in a simulation allows managers to test certain strategies with less risk.	True	False			option1
5	Simulation solutions cannot easily be transferred from one problem domain to another	True	False			option1
5	Determining the duration of the simulation occurs before the model is validated and teste	True	False			option2
5	Which of the following(s) is/are the pre-requisite(s) when Genetic Algorithms are applied to solve problems? (i) Encoding of solutions. (ii) Well-understood search space. (iii) Method of evaluating the suitability of the solutions. (iv) Contain only one optimal solution.	i and ii only	i and iii only	ii and iii only	All of the mentioned	option2
5	Which GA operation is computationally most expensive?	Initial population creation	Selection of sub-population for mating	Reproduction to produce next generation	Convergence testing	option3
5	Which of the following is not true for Genetic algorithms?	It is a probabilistic search algorithm	It is guaranteed to give global optimum solutions	If an optimization problem has more than one solution, then it will return all the solutions	It is an iterative process suitable for parallel programming	option2
5	Which one of the following is not necessarily be considered as GA parameters?	the population size.	the obtainable accuracy	the mutation probability	the average fitness score	option4
5	Which of the following optimization problem(s) can be better solved with Order GA?	0-1 Knapsack problem	Travelling salesman problem	Job shop scheduling problem	Optimal binary search tree construction problem	option2
5	Optimal binary search tree construction problem	1 3 5 7 2 4 6 8	A B D E C F H G	1 0 0 1 1 0 0 1	14.6 -23.4 177.23	option3
5	Roulette wheel selection scheme is preferable when	Fitness values are uniformly distributed	Fitness values are non-uniformly distributed	Needs low selection pressure	Needs high population diversity	option1

5	What GA encoding scheme suffers from Hamming cliff problem?	Binary coded GA	Real coded GA	Order GA	Tree coded GA	option1
5	Which selection strategy is susceptible to a high selection pressure and low population diversity?	Roulette-wheel selection.	Rank based selection.	Tournament selection.	All of the mentioned	option1
5	Which of the following is not a mutation operation in real coded GA?	Flipping	Random mutation.	Polynomial mutation.	All are mutation operation in real coded GA	option1
5	Two parent chromosomes in Order GA encoding scheme is given as follows: * 1 2 3 4 5 6 7 8 9 10 * 10 9 8 7 6 5 4 3 2 1 A k-th point is selected at 4th location according to single point crossover technique. Which of the following off-spring is not possible?	1 2 3 4 10 9 8 7 6 5	7 8 9 10 6 5 4 3 2 1	10 9 8 7 1 2 3 4 5 6	5 6 7 8 9 10 1 2 3 4	option4
5	The purpose of the fitness evaluation operation is	To check whether all individual satisfies the constraints given in the problem	To decide the termination point.	To select the bestindividuals	To identify the individual with worst costfunction	option3
5	If crossover between chromosomes in search space does not produce significantly different offspring, what does it imply? (if offspring consist of one half of each parent) (i) The crossover operation is not successful. (ii) Solution is about to be reached. (iii) Diversity is so poor that the parents involved in the crossover operation are similar. (iv) The search space of the problem is not ideal for GAs to operate	ii, iii & iv only	ii, iii only	i, iii & iv only	All of the mentioned	option2
5	In Rank-based selection scheme, which of the following is not correct	The % area to be occupied by an individual , is given by average of sumation of elements	Two or more individuals with the same fitness values should have the same rank.	Individuals are arranged in a descending order of their fitness values.	The proportionate based selection scheme is followed based on the assigned rank.	option3
5	Tournament Selection has	Low population diversity and moderate selection pressure	High population diversity and Moderate selection pressure	Moderate population diversity and high selection pressure	High population diversity and low selection pressure	option3
5	If selection pressure is HIGH, which one is FALSE	The search focuses only on good individuals (in terms of fitness) at the moment	It loses the population diversity.	Lower rate of convergence.	Leads to pre-mature convergence of the solution to a sub-optimal solution.	option3
5	Which of the following comparison is true?	In the event of restricted accessto information, GAs win out in that they require much fewer information to operate than other search.	Under any circumstances, GAs always outperform other algorithms.	The qualities of solutions offered by GAs for any problems are always better than those provided by other search	GAs could be applied to any problem, whereas certain algorithms are applicable to limited domains.	option1
5	Which of the following is a fitness scaling approach?	Linear scaling	Sigma scaling	Power law scaling	All of the mentioned	option4
5	Important aspect of GA	Definition of objective function	Implementation of genetic representation	Implementation of genetic operators	All of the mentioned	option4
5	Term in GA for chromosome	coded design vector	coded design variable	every bit	Number of coded design variable	option1
5	Term in GA for substring	coded design vector	coded design variable	every bit	Number of coded design variable	option2
5	Term in GA for gene	coded design vector	coded design variable	every bit	Number of coded design variable	option3
5	Term in GA for population	coded design vector	coded design variable	every bit	Number of coded design variable	option4
5	Term in GA for generation	coded design vector	coded design variable	population of design vector after 1 iteration	Number of coded design variable	option3
5	Which of these are adaptive heuristic search algorithms	evolutionary algorithms	genetic algorithms	Binary search	None of these	option2
5	In Genetic algorithm string operate with	Real values	binary number	Decimal Number	None of these	option2

5	In genetic algorithm____ operator is prime operator	selection	termination	recombination	initialization	option3
5	In genetic algorithm selection is _____	deterministic	probabilistic	both	None of these	option2
5	Genetic Algorithm deals with self adaptation	Yes	No			option2
5	Why to use genetic algorithm	Provide optimization over small space area	Provide optimization over large space area	They break on slight change in input	None of these	option2
5	Parent 1 is 1 0 1 1 1 1 1 1 Parent 2 is 0 1 0 1 0 0 0 0. If single point crossover is made after 5th point, what is its possible child	1 0 1 1 1 0 0 1	0 1 0 1 0 1 1 0	1 0 1 1 1 0 0 0	0 1 0 1 0 1 0 1	option3
5	Probability of crossover is	Crossover point	Crossover rate	Cross-over population	None of these	option2
5	Consider chromosome 1 2 3 4 5 6 7 8 9. Random points generated were 2 and 5 so result of scramble will be	1 2 3 4 5 6 7 8 9	1 5 3 4 2 6 7 8 9	1 5 4 3 2 6 7 8 9	None of these	option3
5	Sequential GA	Generational	Centralized	Distributed	None of these	option1
5	Parallel GA	Generational	Steady state	Distributed	None of these	option3
5	Examples of stopping criteria in GA can be	Generation limit	No change in fitness	Elapsed time	All of the mentioned	option4
5	Category of GBML systems	Pittsburg Approach	Divide n conquer approach	Michi Approach	None of these	option1
5	PGA is	Parallel Genetic Algorithm	Proportional Genetic Algorithm	Perceptron based Genetic Algorithm	None of these	option1
5	Schema theorem serves as _____ tool for GA process	Analysis	Computation	Termination	None of these	option1
5	If H=10*1* then o(H)=	1	2	3	4	option3
6	Which of the following are stochastic algorithms (i.e., algorithms which for the same input can produce different output)?	Genetic Algorithms	Particle Swarm Optimization	Ant Colony Optimization	All of the mentioned	option4
6	Swarm intelligence (SI) is	collective behavior of decentralized, self-organized systems, natural or artificial	fuzzy logic system	crisp logic concept	None of these	option1
6	Swarm intelligence (SI) introduced by	Gerardo Beni and Jing Wang	Gerardo Beni and James Gosling	George M and Jing Wang	None of these	option1
6	The application of swarm principles to robots is called	swarm robotics	swarm behaviour	robotics	None of these	option1
6	Methods of Swarm intelligence is	Particle swarm optimization	Ant colony optimization	Both	None of these	option3
6	PSO stands for	Particle Swarm Optimization	Particle Selection Optimization	Portion Swarm Optimization	Portion Selection Optimization	option1
6	ACO stands for	Analytical Colony Optimization	Ant Colony Optimization	Ant Coding optimization	None of these	option2
6	Each particle of swarm maintaines record of	pbest	gbest	Both pbest, gbest	None of these	option3
6	pbest is	personal best	personal based	proper based	proper best	option1
6	gbest is	global best	general best	global based	general based	option1
6	In PSO partical move towards global optimum step by step that is known as	progress	loops	iteration	None of these	option3
6	particle has	fitness value	velocity	pbest	All of the mentioned	option4
6	In each iteration every particle in swarm gets_____ chance to move towards global optimum	1	2	3	Many	option1
6	In each iteration every particle in swarm we update	velocity	gbest	Both velocity ,gbest	None of these	option3
6	Particles velocity is given by	Vi(t+1)=w*Vi - c1*rand*(pbest-xi)+ c2*rand*(gbest-xi)	Vi(t+1)=w*Vi +c1*rand*(pbest-xi)- c2*rand*(gbest-xi)	Vi(t+1)=w*Vi +c1*rand*(gbest-xi)+ c2*rand*(pbest-xi)	Vi(t+1)=w*Vi +c1*rand*(pbest-xi)+ c2*rand*(gbest-xi)	option4
6	Particle update rule is	Xi(t+1)=Xit+Vi(t+1)	Xi(t+1)=Xit-Vi(t+1)	Vi(t+1)=w*Vi +c1*rand*(pbest-xi)+ c2*rand*(gbest-xi)	Vi(t+1)=w*Vi +c1*rand*(pbest-xi)- c2*rand*(gbest-xi)	option1
6	In particle swarm optimization, c1,c2 are	Acceleration Coeficient	Cognitive Component	Social Component	Inertia term	option1
6	In Particles velocity, cognitive component is	c1*rand*(pbest-xi)+ c2*rand*(gbest-xi)	c1*rand*(pbest-xi)	c2*rand*(gbest-xi)	None of these	option2
6	In Particles velocity, social component is	c1*rand*(pbest-xi)+ c2*rand*(gbest-xi)	c1*rand*(pbest-xi)	c2*rand*(gbest-xi)	None of these	option3
6	In Particles velocity, inertia term is	c1*rand*(pbest-xi)+ c2*rand*(gbest-xi)	c1*rand*(pbest-xi)	c2*rand*(gbest-xi)	None of these	option4
6	In PSO important thing is	Communication	Learning	Both	None of these	option3

6	Premature convergence of PSO is	Once PSO traps in global optimum, it is dificult to jump out of global optimum	Once PSO traps in local optimum, it is dificult to jump out of local optimum	Once PSO traps in local optimum, it is dificult to jump out of global optimum	Once PSO traps in global optimum, it is dificult to jump out of local optimum	option2
6	PSO topology	Star	Ring	Adaptive random	All of the mentioned	option4
6	In binary PSO,solution in_____is binary string	Population	chromosome	swarm	velocity	option1
6	Chemical substance release by ants is	pheromone	perchloric	Both	None of these	option1
6	ACO is typically used to solve_____ based problem	searching	graph	database	None of these	option2
6	ACO inspired by	ant colony foraging	bird flocking	both	None of these	option1
6	PSO inspired by	ant colony foraging	bird flocking	both	None of these	option2
6	ACO is best at finding _____ solution	discreate	continuous	both	None of these	option1
6	PSO is best at finding _____ solution	discreate	continuous	both	None of these	option2
6	In ACO there exist two matrix	Cost matrix, Pheromone Matrix	Cost Matrix, Velocity Matrix	Velocity Matrix, Pheromone Matrix	Velocity Matrix, Pheromone Matrix	option1
6	Ants are _____ that move along between nodes in a graph.	Participants	Population	Agents	None of these	option3
6	ACO is _____ optimization	Heuristic	Metaheuristic	Probabilistic	None of these	option2
6	Ants uses _____ communication via pheromone trails	Direct	Stigmergic	eulogic	None of these	option2
6	Autocatalysis is	Positive feedback loop	Negative feedback loop	Condition occur at termination of algorithm	Allows ants to explore less promising areas	option1
6	ACO algorithms also called as	Autocatalytic negative feedback algorithm	Autocatalytic positive feedback algorithm	Autocatalytic forward feedback algorithm	Autocatalytic backward feedback algorithm	option2
6	Ant System first introduced by	James Kennedy	Russell E.	Marco Dorigo	L. A. Zadeh	option3
6	Application of Ant systems	Scheduling Problem	Assignment Problem	Set Problem	All of the mentioned	option4
6	_____avoids premature convergence in ACO	distributed computing	pheromone	Global pheromone update	Transition rule	option1
6	ACO performed poorly for TSP problems larger than ___ cities	60	65	70	75	option4
6	In ACO___ search is extreamly important to obtain good result	local	global	distributed	None of these	option1
6	Optimization in PSO is	Metaheuristic	Stochastic	Discreate	Continuous	option2
6	PSO	find shortest path	reach target with minimal duration	find local finest solution	find best among others	option2
6	Quadratic Assignment problem can be solved by	ES	GA	PSO	ACO	option4
6	Vehicle routing can be solved by	ES	GA	PSO	ACO	option4
6	Automatic programming uses	ES	GA	PSO	ACO	option2
6	Economic models uses	ES	GA	PSO	ACO	option2
6	Heating system planning problem uses	ES	GA	PSO	ACO	option3
6	Amount of pheromone deposited	1/length_of_tour, if path is not used	1/length_of_tour, if path is used	length_of_tour, if path is not used	length_of_tour, if path is used	option2
6	When all ants have completed a solution,the trails are updated with	$\tau xy=(1-p)*\tau xy-\sum\Delta\tau xy$	$\tau xy=(1-p)+\sum\Delta\tau xy$	$\tau xy=(1-p)*\tau xy+\sum\Delta\tau xy$	$\tau xy=(1-p)*\tau xy-\tau xy$	option3