Examination:	May-June 2018	**Date:**	11/5/2018
Branch:	Computer Engineering	**Subject:**	DSP
Class/SEM:	BE/VII	**Paper Code:**	22975

Examination:	May-June 2018	**Date:**	17-5-18
Branch:	Computer Engineering	**Subject:**	CSS
Class/SEM:	BE/VII	**Paper Code:**	24643

Examination:	May-June 2018	**Date:**	25-5-18
Branch:	Computer Engineering	**Subject:**	AI
Class/SEM:	BE/VII	**Paper Code:**	24612

BE/VII

Examination:	May-June 2018	**Date:**	29-5-18
Branch:	Computer Engineering	**Subject:**	SC
Class/SEM:	BE/VII	**Paper Code:**	35522

QP CODE : 22975

(3 hours) Total Marks: 80

N.B.   1. Question **No. 1** is compulsory
       2. Attempt any **three** out of remaining
       3. Assume suitable data if **necessary** and justify the assumptions
       4. Figures to the **right** indicate full marks

Q1 A Evaluate DFT of x(n)=cos(0.25Πn).   05

    B Determine the energy and power of signal given by x(n) = (1/3)^n u(n).   05

    C Find the circular Convolution of the following causal signals   05
          x_1(n)= { 3, 2, 4, 1} and x_2(n)={ 2, 1, 3 }
    D Define BIBO Stable system.   05

Q2 A State the following DFT properties: 10
          1.Linearity
          2.Periodicity
          3.Scaling
          4.Convolution
          5.Time Reversal

    B Consider the following analog signal   10
       x(t)=5 cos 2Π (1000 t) + 10 cos 2Π(5000t) to be sampled.
       I) Evaluate the Nyquist rate for this signal.
       II) If the signal is sampled at 4 kHz , will the signal be recovered from its
       samples?

Q3 A For the causal LTI digital filter with impulse response given by   10

       h(n) = δ(n) – 2δ(n-1) + δ(n-2) +2δ(n-3) sketch the magnitude response of the

       filter.

    B Design radix 2FFT flow graph for x(n)={2, 1, 3, 1}   10

Q4 A Check whether the system y[n] = x[n] + 2x[n-2] is: 10
          i)Static or Dynamic
          ii)Linear or Non-linear
          iii)Causal or Non-Casual
          iv) Shift variant or Shift Invariant
    B Compute linear convolution of the causal sequences x[n]= {3, 4, 2, 1, 2, 2, 1, 1}   10
       and h[n]={1, -1} using overlap add method.

[TURN OVER]

1

Q5 A For x(n) = {3, 2, 1, 6, 4, 5}, plot the following Discrete Time signals: 10

    1.) x(n+1)   2.) x(-n)u(-n)   3.) x(n-1)u(-n-1)

    4.) x(n-1)u(n)   5.) x(n-2)

B Perform Cross correlation of the causal sequences   10
   x(n)= {3, 3, 1, 1 } y(n) = { 1, 2, 1}

Q6 A Write a detailed note on TMS 320   10

B Explain the significance of Carl's Correlation Coefficient Algorithm in digital   10
   signal processing. Evaluate Carl's Coefficient for two causal sequences
   x[n]={1, 3, 4, 2} and y[n]={1, 2, 2, -1}.

2

Q.P. Code: 24643

(3 Hours) [Total Marks:80]

1. Question No. 1 is compulsory.
2. Attempt any three out of the remaining five questions.
3. Assume suitable data if necessary
4. Figures to right indicate full marks.

(a)	What is the purpose of S-boxes in DES? Explain the avalanche effect?	[05]
(b)	Give examples of replay attacks. List three general approaches for dealing with replay attacks.	[05]
(c)	Why is the segmentation and reassembly function in PGP(Pretty Good Privacy) needed?	[05]
(d)	List and explain various types of attacks on encrypted message.	[05]

(a)	What is the need for message authentication? List various techniques used for message authentication. Explain any one.	[10]
(b)	Explain Kerberos protocol that supports authentication in distributed system.	[10]

(a)	What characteristics are needed in secure hash function? Explain the operation of secure hash algorithm on 512 bit block.	[10]
(b)	What is a nonce in key distribution scenario? Explain the key distribution scenario if A wishes to establish logical connection with B. A and B both have a master key which they share with itself and key distribution center.	[10]

4 (a)	Why E-commerce transactions need security? Which tasks are performed by payment gateway in E-commerce transaction? Explain the SET (Secure Electronic Transaction) protocol.	[10]
(b)	In RSA system the public key of a given user e=7 & n=187.	[10]

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1) What is the private key of this user?

2) If the intercepted CT=11 and sent to a user whose public key e=7 & n=187. What is the PT?

3) Elaborate various kinds of attacks on RSA algorithm?

Q.5 (a) How can we achieve web security? Explain with example. [10]

(b) Use Hill cipher to encrypt the text "short". The key to be used is "hill". [10]

Q.6 (a) Explain IPSec protocol in detail. Also write applications and advantages of IPSec. [10]

(b) Differentiate between i) MD-5 and SHA ii) Firewall and IDS. [10]

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Q. P. Code: 24612

(3 Hours)
[Total Marks: 80]

Note:

(i) Each question carries 20 marks
(ii) Question 1 is compulsory
(iii) Attempt any three (3) from the remaining questions
(iv) Assume suitable data wherever required

Q.1. Attempt any four (4) questions from the following. [20]
   a) Define Intelligent Agent. What are the characteristics of Intelligent Agent?
   b) Give State space representation for 8 puzzle Problem. What are possible Heuristic functions for it?
   c) What is FOPL? Represent the following sentences using FOPL
      i) John has at least two friends
      ii) If two people are friends then they are not enemies.
   d) Differentiate between forward and backward chaining.
   e) Define Belief Network. Explain conditional Independence relation in Belief Network with example.

Q.2 a) Draw and Describe the Architecture of Utility based agent. How is it different from Model based agent? [10]
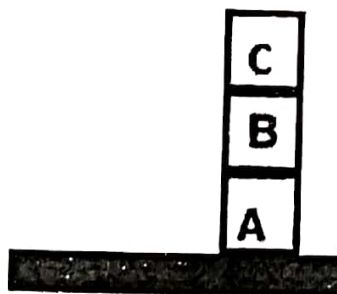
   b) Explain A* Algorithm with example. [10]

Q.3 a) Explain Resolution by Refutation with suitable example [10]

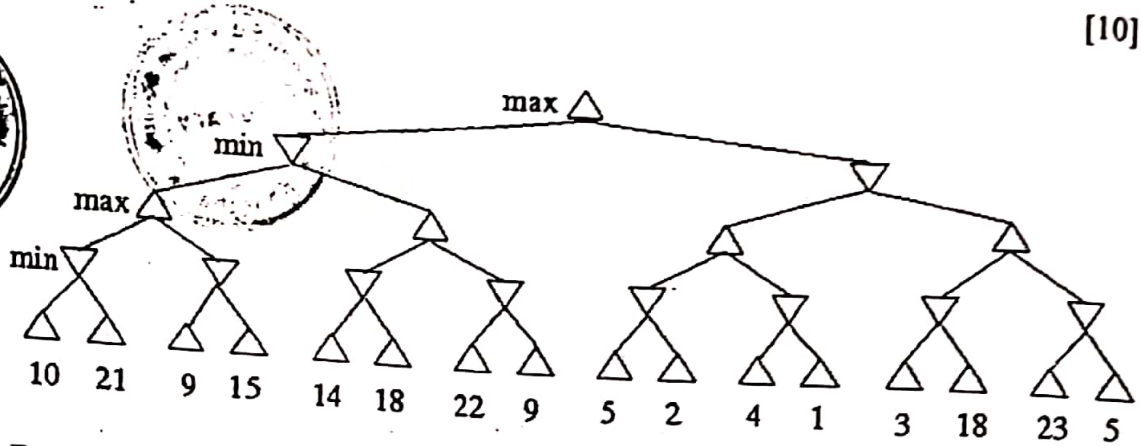   b) Give the partial order plan for the following blocks-world-problem [10]
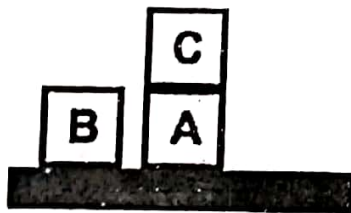
Start State   Goal State

Q.4 a) Apply Alpha-Beta pruning on following example considering first node as MAX

[10]

b) Explain different Inference Rules for First Order Predicate Logic.

[10]

Q.5 a) Define the terms chromosome, fitness function, crossover and mutation as used in Genetic algorithms. Explain how Genetic algorithms work.

[10]

b) What are steps involved in natural language processing (NLP) of an English sentence? Explain with an example sentence.

[10]

Q. 6 Write short note on any two of the following

a) Expert System Architecture and Applications

[20]

b) Local Search Algorithms

c) Decision Tree learning

(3 Hours)

Total Marks:80

N.B : (1) Question No. 1 is compulsory
(2) Attempt **any three** questions out of remaining **five**.

1. (a) The formation of algal solutions in surface water is strongly dependent on pH **(05)**
of water, temperature and oxygen content. T is a set of water temperatures
from a lake given by T = {50, 55, 60} and O is a set of oxygen content values
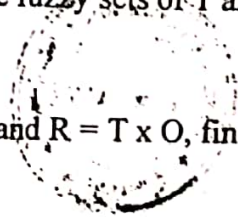in water given by O = {1, 2, 6}. The fuzzy sets of T and O are
T = {0.7/50 + 0.8/55 + 0.9/60}
O = {0.1/1 + 0.6/2 + 0.8/6}.
Given I = {0.5/50 + 1/55 + 0.7/60} and R = T x O, find
   i.   A = I o R
   ii. B = I • R

   (b) What is competitive learning? Explain winner take all learning rule. **(05)**

   (c) What are hybrid systems? Explain any 2 types of hybrid systems. **(05)**

   (d) Explain with example any 5 operations performed in Genetic Algorithm. **(05)**

2. (a) Write Extension Principle and explain with an example. How do you perform **(10)**
fuzzy addition using extension principle?

   (b) With a neat diagram explain the architecture of ANFIS. **(10)**

Design a fuzzy logic controller to determine the amount of detergent required **(20)**
for a washing machine. Assume the input as dirt and grease on the clothes.
Use 4 descriptors for input as well as output. Derive a set of rules for control
action and appropriate defuzzification. The design should be supported by
figures. Prove that when the clothes are soiled to a larger extent the amount
of detergent required is also more.

(a) Compare Mamdani, Tsukamoto and Sugeno models w.r.t number and type of **(10)**
i/p and o/p, fuzzy rules created, defuzzification methods.

(b) Explain with algorithm Kohonen's Self Organizing Feature Maps. **(10)**

(a) Explain the method of Steepest Descent of optimization. **(10)**

(b) Explain McCulloch-Pitts model with an example of AND functionality. **(10)**

6. Write short notes on: (20)

(a) LVQ algorithm

(b) Multi Continuous Perceptron Training Algorithm

(c) Defuzzification techniques

(d) Characteristics of Soft Computing