BE/SEM VII/CBSGS/COMP/DSP 13/5/16

QP Code : 31256

(3 hours) Total Marks: 80

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

Q1 A For the given causal sequences x(n) = {8, 9, 2, 3} and h(n) = {4, 3, 6} find the cross correlation. **05**

B State the condition for stability of LTI system and determine for the given discrete time system $h(n) = (0.3)^n u(n) + 5\delta(n)$, is stable or not. **05**

C Differentiate IIR and FIR systems. **05**

D For the causal signal x(n) = {2, 2, 4, 4} compute four point DFT using DIT-FFT. **05**

Q2 A Check whether following system $y(n) = 2x(n-1) + x(2n)$ is: **10**

1. Linear or non Linear
2. Causal or non-causal
3. Time variant or Time invariant
4. Static or Dynamic

B Draw the radix 2 DIT flow graph and find the DFT of the sequence x(n) = {10, 11, 8, 5} using FFT flow graph. **10**

Q3 A For x(n) = {2 3 4 5 1 3}, plot the following Discrete Time signals: **10**
(↑ marked under 4)

1.) x(n-1) 2.) x(n)u(-n) 3.) x(n-1)u(-n-1)
4.) x(-n)u(n) 5.) x(2n)

B Determine whether or not the following signals are periodic. If periodic specify its fundamental period. **10**

1. $x(n) = \sin(0.25\pi n + 0.4)$
2. $x(n) = \cos(0.5n\pi) + \sin(0.25n\pi)$

Q4 A For the FIR digital filter with impulse response given by $h(n) = 2\delta(n) + 3\delta(n-1) + 4\delta(n-3) + \delta(n-4)$ sketch the magnitude response of the filter. **10**

B State any five DFT properties. **10**

[TURN OVER]

FW-Con. 9945-16.

Q5	A	Find circular convolution of $x_1(n) = \{5, 6, 2, 1\}$ and $x_2(n) = \{3, 2, 1, 4\}$ by computing DFT of $x_1(n)$ and $x_2(n)$.	10
	B	Compute Linear Convolution of causal sequence $x(n) = \{7, 6, 4, 5, 2, 4, 5, 2, 3\}$ and $h(n)=\{1\ 2\ 3\ 1\}$ using fast overlap save method.	10
Q6	A	Write a detailed note on Carls' Correlation Coefficient Algorithm.	10
	B	Write a detailed note on DSP Processor and Architecture.	10

Extra

BE/Sem VII/Comp/CBSGS/Artificial Intelligence

25/05/2016

QP Code : 31334

(3 Hours) **[Total Marks : 80]**

N. B. : (1) **Each** question carry **20** marks.
(2) Question **1** is **compulsory.**
(3) Attempt any **three** (3) from the remaining questions.
(4) Assume suitable data wherever required.

1. Attempt any **four** (4) questions from the following: **20**
   (a) Draw and explain architecture of Expert System.
   (b) Explain Hill-climbing algorithm with an example.
   (c) Give PEAS description for a Robot Soccer player. Characterize its environment.
   (d) Explain Turing test designed for satisfactory operational definition of intelligence.
   (e) Prove that A* is admissible if it uses a monotone heuristic.
   (f) Compare and Contrast problem solving agent and planning agent.

2. (a) Explain decision tree learning with an example. What are decision rules? How to use it for classifying new samples? **10**
   (b) Write first order logic statements for following statements: **10**
      (i) If a perfect square is divisible by a prime p then it is also divisible by square of p.
      (ii) Every perfect square is divisible by some prime.
      (iii) Alice does not like Chemistry and History.
      (iv) If it is Saturday and warm, then Sam is in the park.
      (v) Anything anyone eats and is not killed by is food.

3. (a) Design a planning agent for a Blocks World problem. Assume suitable initial state and final state for the problem. **10**
   (b) Find the probabilistic inference by enumeration of entries in a full joint distribution table shown in figure 1. **10**
      (i) No cavity when toothache is there
      (ii) p (Cavity! toothache or catch)

	toothache		¬toothache	
	catch	¬catch	catch	¬catch
cavity	.108	.012	.072	.008
¬cavity	.016	.064	.144	.576

Figure 1.

[TURN OVER

FW-Con. 11269-16.

4. (a) Compare following informed searching algorithms based on performance measure with justification: Complete, Optimal, Time complexity and space complexity. **10**
   a) Greedy best first
   b) A*
   c) Recursive best-first (RBFS)

   (b) Apply alpha-Beta pruning on example given in Figure 2 considering first node as max. **10**

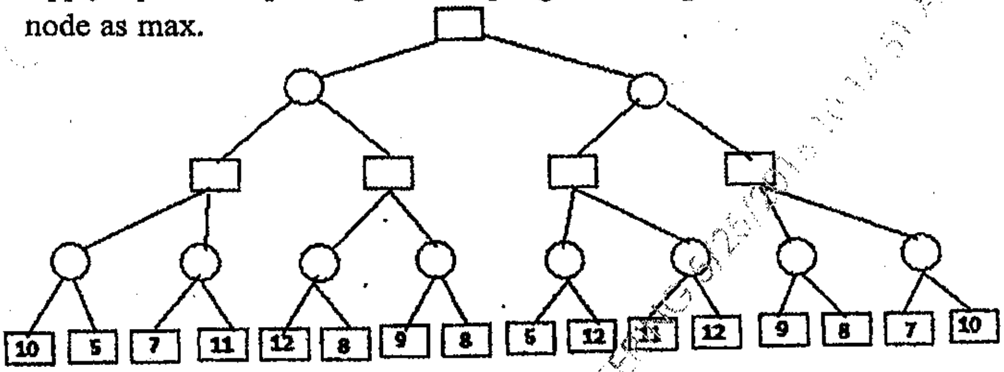

Figure 2.

5. (a) Explain how genetic algorithm can be used to solve a problem by taking a suitable example. **10**

   (b) Consider the graph given in Figure 3 below. Assume that the initial state is A and the goal state is G Find a path from the initial state to the goal state using DFS. Also report the solution cost **10**

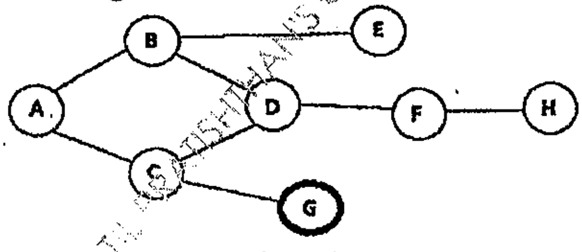

Figure 3.

6. (a) Explain the steps involved in converting the propositional logic statement into CNF with a suitable example **10**

   (b) What are the basic building blocks of Learning Agent? Explain each of them with a neat block diagram. **10**

BE/Comp/Sem VII/Old/MC
31/05/2016

QP Code : 29911

(3 Hours) Total Marks: 100

Instructions: - 1) Question No 1 is compulsory; solve any 4 questions from remaining 6 question.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

Q 1) a) List and explain the features of traditional TCP that influence the efficiency of TCP in Mobile environment. (10 Marks)

b) Explain the operations of CDMA with timing diagram. (10 Marks)

Q 2) a) Discuss the IP reverse tunneling. (10 Marks)

b) Name the main difference Adhoc Network and other networks what advantages do other network offers? Explain in detail with suitable example. (10 Marks)

Q 3) a) What are the general problems of mobile IP regarding security and support of quality of service? (10 Marks)

b) What is meant by WATM? Describe WATM reference model, location management , services and QOS. (10 Marks)

Q 4) a) Name the main elements of GSM system architecture and describe their functions. What are the advantages of specifying not only the radio interface but also the internal interfaces of the GSM system ? Explain the inter-BSC, intra-MSC handover process in the GSM system using typical signals and a message sequence chart. (10 Marks)

b) Discuss the role of WWW in support for mobility. (10 Marks)

Q 5) a) Discuss the IP reverse tunneling.? (10 Marks)

b) What are mobile agents ? Discuss their primary advantages over other approaches.(10 Marks)

Q 6) a) What are the major difference between WAP 2.0 and WAP 1.x? What influenced the WAP 2.0 development? (10 Marks)

b Distinguish between HSCSD and GPRS? How is GPRS made possible over GSM? Explain? (10 Marks)

Q 7) Write shirt notes on any two. (20 Marks)

a) Wireless Telephony applications.

b) M-Commerce

c) Name the inefficiencies of mobile IP regarding data forwarding from a correspondent node to a mobile node. What are optimizations and what additional problems do they cause?

GE-Con. 11596-16.