

Q. P. Code : 622701

(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 Compare IIR systems with FIR systems. 05  
 B State whether  $x[n] = \sin(n\pi/3)$  is an energy or power signal with proper justification. 05  
 C If  $x[n] = \{1, 2, 2, 1, 3, 1\}$  is a periodic signal. Plot it in circular representation for  
 i)  $x[-n]$  ii)  $x[n-2]$  iii)  $x[n+2]$  iv)  $x[-(n-2)]$  v)  $x[-(n+2)]$  05  
 D State BIBO stability criterion for LTI systems. Determine the range of values of 'p' and 'q' for the stability of LTI system with impulse response: 05  

$$h[n] = p^n \quad ; n < 0$$

$$= q^n \quad ; n \geq 0$$
- Q2 A Check whether the system  $y[n] = a^n u[n]$  is: 10  
 i) Static or Dynamic  
 ii) Linear or Non-linear  
 iii) Causal or Non-Casual  
 iv) Shift variant or Shift Invariant
- B Check the periodicity of the following signals and if periodic, find their fundamental period. 10  
 i)  $\cos(n/6) \cdot \cos(n\pi/6)$   
 ii)  $\sin(2\pi n/3) + \cos(2\pi n/5)$
- Q3 A Determine the output response of the LTI system using time domain method 10  
 , whose input is  $x[n] = 3\delta[n+1] - 2\delta[n] + \delta[n-1] + 4\delta[n-2]$  and  
 $h[n] = 2\delta[n-1] + 5\delta[n-2] + 3\delta[n-3]$ .
- B If a continuous time signal  $x(t) = \sin(2\pi \times 2000t) + 2\sin(2\pi \times 1000t)$  is 10  
 sampled at 8000 samples /sec. Find out the 4-point DFT of it. Sketch the phase and magnitude spectrum.
- Q4 A Explain any five properties of DFT. 10  
 B Compute linear convolution of the causal sequences  $x[n] = \{2, -3, 1, -4, 3, -2, 4, -1\}$  10  
 and  $h[n] = \{2, -1\}$  using overlap save method.

[TURN OVER]

- Q5 A Compute circular convolution of the causal sequences  $x[n] = \{1, -1, 1, -1\}$  and  $h[n] = \{1, 2, 3, 4\}$  using radix-2 DIT FFT method. 10
- B If the DFT of  $x[n]$  is  $X(k) = \{2, -j3, 0, j3\}$  using DFT properties, find : 10
- i) DFT of  $x[n-2]$
  - ii) Signal energy
  - iii) DFT of  $x^*[n]$
  - iv) DFT of  $x^2[n]$
  - v) DFT of  $x[-n]$
- Q6 A Explain the significance of Carl's Correlation Coefficient Algorithm in digital signal processing. Evaluate Carl's Coefficient for two causal sequences  $x[n] = \{2, 4, 4, 8\}$  and  $y[n] = \{1, 1, 2, 2\}$ . 10
- B i) Calculate the percentage saving in calculations in a 64 point radix-2 FFT systems with respect to the number of complex additions and multiplications required, when compared to direct DFT system. 5
- B ii) Write a detailed note on DSP processor. 5
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3 hrs.

80 marks

- Note :
1. Question 1 is compulsory.
  2. Attempt any 3 questions out of the rest.
  3. Make suitable assumptions whenever necessary and justify them
  4. Each question carries equal marks.

Q1.

- a) Use the Play fair cipher with the keyword : "MEDICINE" to encipher the message "The greatest wealth is health". (5)
- b) Explain key rings in PGP. (5)
- c) Briefly define idea behind RSA and also explain (10)
- 1) What is the one way function in this system?
  - 2) What is the trap door in this?
  - 3) Give Public key and Private Key.
  - 4) Describe security in this system.

Q2)a) Explain DES, detailing the Feistel structure and S-block design (10)

- b) Consider a Voter data management system in E-voting system with sensitive and non-sensitive attributes. (10)

1) Show with sample queries how attacks ( Direct, Inference) are possible on such data sets

2) Suggest 2 different ways to mitigate the problem.

Q 3)

- a) Explain Diffie-Hellman Key exchange algorithm with suitable example. Also explain the problem of MIM attack in it (10)
- b) What are Denial of Service attacks? Explain any three types of DOS attacks in detail (10)

Q 4)

- a) IPsec offers security at n/w layer. What is the need of SSL? Explain the services of SSL protocol? (10)
- b) What are the types of firewalls? How are firewalls different from IDS (10)

Q 5)a) What are the various ways in which public key distribution is implemented. Explain the working of public key certificates clearly detailing the role of certificate authority. (10)

- b) Why are Digital Signatures & Digital certificates required? What is the significance of Dual Signature. (10)

Q6 Attempt any 4 (20)

- a) SHA-1
- b) Timing and Storage Covert Channel
- c) Session Hijacking and Spoofing
- d) Blowfish
- f) S/MIME

BE comp | sem-VII | CBSGS | DT-25/5/2017.

Q. P. Code : 811600

(3 Hours)

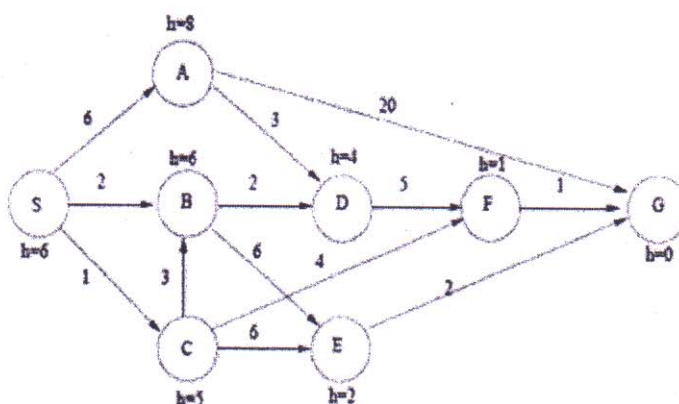
Total Marks : 80

- N.B. 1. Question No. 1 is **compulsory**  
 2. Attempt any three (3) out of remaining five (5) questions  
 3. Assume suitable data if **necessary** and **justify** the assumptions  
 4. Figures to the **right** indicate full marks

Q1 Attempt an four (4) from the following

- [A] Define AI. What are applications of AI? [05]  
 [B] Define heuristic function. Give an example heuristics function for 8-puzzle problem. Find the heuristics value for a particular state of the Blocks World Problem. [05]  
 [C] Compare Model based Agent with Utility based Agent. [05]  
 [D] What are the problems/frustrations that occur in hill climbing technique? Illustrate with an example [05]  
 [E] What is supervised learning and unsupervised learning? Give example of each. [05]

Q2 [A] Consider the search problem below with start state S and goal state G. The transition costs are next to the edges and the heuristic values are next to the states. What is the final cost using A\* search. [10]



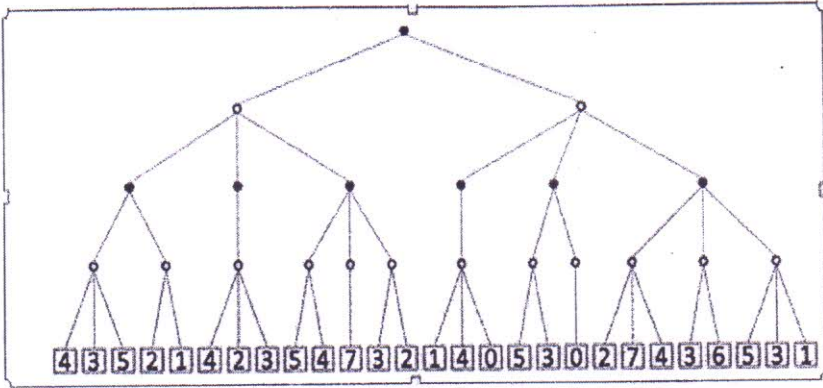
[B] Explain the architecture of Expert System. What are advantages and limitations of Expert System? [10]

Q3 [A] Explain with example various uninformed search techniques. [10]

[B] Illustrate Forward chaining and backward chaining in propositional logic with example [10]

[TURN OVER]

- Q4 [A] Apply alpha-Beta pruning on following example considering first node as MAX [10]  
 MAX



- [B] Explain a partial order planner with an example. [10]

- Q5 [A] Consider the following facts about dolphins: [10]

Whoever can read is literate. Dolphins are not literate. Some dolphins are intelligent.

- (i) Represent the above sentences in first order predicate logic (FOPL).
- (ii) Convert them to clause form
- (iii) Prove that "Some who are Intelligent cannot read" using resolution technique

- [B] What is Uncertainty? Explain Bayesian Network with example [10]

- Q6 Write short note on any two of the following: [20]

- (i) Steps in Natural Language Processing
- (ii) Decision Tree Algorithm with an example
- (iv) Genetic Algorithms

