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Question Paper Code : 80302

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Electronics and Instrumentation Engineering

CS 6659 — ARTIFICIAL INTELLIGENCE

(Common to Instrumentation and Control Engineering and Sixth Semester Computer Science and Engineering and Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is Heuristic function?
2. What are the categories of production systems?
3. List the two levels of knowledge representation.
4. What is Alpha-Beta pruning?
5. What are fuzzy sets?
6. List the properties of fuzzy sets.
7. What are the different types of planners?
8. Write the difference between supervised learning and unsupervised learning.
9. Define an expert system.
10. What is XCON?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Exemplify the necessary components to define an AI problem with an example. (6)

(ii) Consider a water jug problem. You are given 2 jugs : a 4-gallon and a 3-gallon jugs. Neither has any measuring mark in it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2-gallon of water into a 4-gallon jug? State the production rules for the water jug problem. (10)

Or

(b) (i) Write the algorithm for steepest ascent hill climbing. (4)

(ii) Explain DFS algorithm with an example. (8)

(iii) State the characteristics of an AI problem. (4)

12. (a) Explain resolution in predicate logic with suitable example. (16)

Or

(b) Consider the following sentences :

- John like all kinds of food
- Apples are food
- Chicken is food
- Anything any one eats and isn't killed by is food
- Bill eats peanuts and is still alive
- Sue eats everything Bill eats.

(i) Translate these sentences into formulae in predicate logic (10)

(ii) Convert the above FOL into clause form. (6)

13. (a) Explain in detail about forward chaining and backward chaining with algorithms. (16)

Or

(b) What is Dempster-Shafer theory? Explain with suitable example. (16)

14. (a) (i) Describe hierarchical planning method with an example. (8)

(ii) Describe learning with macro-operators. (8)

Or

(b) (i) Explain the various types of learning in problem solving. (6)

(ii) Explain learning in Decision Tree with example. (10)

15. (a) (i) Explain about the Knowledge acquisition. (10)

(ii) Brief any six applications of expert systems. (6)

Or

(b) Explain with neat diagram the architecture of expert system and mention its features. (16)

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Question Paper Code : 80598

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Computer Science and Engineering

IT 6601 — MOBILE COMPUTING

(Common to Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the limitations of Mobile computing?
2. What are the different Random Assignment Scheme in MAC?
3. Define COA
4. Illustrate the use of BOOTP protocol?
5. Write about the supplementary services in GSM?
6. What is multicasting?
7. Outline the concept of RTT?
8. Compare and contrast MANET Vs VANET
9. Define POS.
10. Differentiate E-Commerce and M-Commerce.

PART B — (5 × 16 = 80 marks)

11. (a) Differentiate between FDMA, TDMA and CDMA. (16)

Or

(b) (i) Explain the Distinguishing features of various generations of wireless networks. (8)

(ii) Describe the applications of Mobile computing. (8)

12. (a) Explain about the Key mechanism in Mobile IP. (16)

Or

(b) Give the comparison of various TCP advantages and Disadvantages in Wireless networking. (16)

13. (a) (i) What are the functions of authentication and encryption in GSM? How is system security maintained. (8)

(ii) Explain in detail about the handovers of GSM. (8)

Or

(b) (i) Explain the functions of GPRS protocol stack with a diagram. (8)

(ii) Explain in detail about UMTS architecture. (8)

14. (a) Explain the Traditional Routing Protocols. (16)

Or

(b) (i) What are Multicast routing protocols. (8)

(ii) What are reactive and proactive protocols? Specify its advantages and disadvantages. (8)

15. (a) (i) Compare and contrast the various Mobile OS. (10)

(ii) Discuss the applications of M-Commerce. (6)

Or

(b) (i) Explain Mobile Payment Models and security issues. (10)

(ii) What is RFID? Explain few applications in which RFID is useful. (6)

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Question Paper Code : 80303

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Computer Science and Engineering

CS 6660 — COMPILER DESIGN

(Common to Sixth Semester Information Technology)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is a symbol table?
2. List the various compiler construction tools.
3. List the rules that form the BASIS.
4. Differentiate tokens, patterns, lexeme.
5. Construct a parse tree for –(id + id)
6. What is meant by handle pruning?
7. Write down syntax directed definition of a simple desk calculator.
8. List Dynamic Storage allocation techniques.
9. Identify the constructs for optimization in basic block.
10. What are the characteristics of peephole optimization?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the phases of compiler with a neat diagram. (10)

(ii) Write notes on compiler Construction tools. (6)

Or

(b) (i) Explain the need for grouping of phases. (8)

(ii) Explain the various errors encountered in different phases of compiler. (8)

12. (a) (i) Discuss the role of lexical analyzer in detail with necessary examples. (8)

(ii) Discuss how finite automata is used to represent tokens and perform lexical analysis with examples. (8)

Or

(b) (i) Conversion of regular expression (a/b)*abb to NFA. (8)

(ii) Write an algorithm for minimizing the number of states of a DFA. (8)

13. (a) (i) Construct parse tree for the input string w = cad using top down parser. (6)

$S \rightarrow cAd$

$A \rightarrow ab \mid a$

(ii) Construct parsing table for the grammar and find moves made by predictive parser on input id+id*id and find FIRST and FOLLOW. (10)

$E \rightarrow E + T$

$E \rightarrow T$

$T \rightarrow T * F$

$T \rightarrow F$

$F \rightarrow (E)/id$

Or

(b) (i) Explain ambiguous grammar $G : E \rightarrow E + E \mid E * E \mid (E) \mid -E \mid id$ for the sentence id+id*id. (6)

(ii) Construct SLR parsing table for the following grammar :

$G : E \rightarrow E + T \mid T T \rightarrow T * F \mid F F \rightarrow (E) \mid id$. (10)

14. (a) (i) A Syntax-Directed Translation scheme that takes strings of a's, b's and c's as input and produces as output the number of substrings in the input string that correspond to the pattern a(a | b)*c+(a | b)*b. For example the translation of the input string "abbcabcababc" is "3".

(1) Write a context-free grammar that generate all strings of a's. b's and c's.

(2) Give the semantic attributes for the grammar symbols.

(3) For each production of the grammar present a set of rules for evaluation of the semantic attributes. (8)

(ii) Illustrate type checking with necessary diagram. (8)

Or

(b) Explain the following with respect to code generation phase.

(i) Input to code generator

(ii) Target program

(iii) Memory management

(iv) Instruction selection

(v) Register allocation

(vi) Evaluation order. (16)

15. (a) (i) Write an algorithm for constructing natural loop of a back edge. (8)

(ii) Explain any four issues that crop up when designing a code generator. (8)

Or

(b) Explain global data flow analysis with necessary equations. (16)

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Question Paper Code : 80596

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Fifth Semester

Information Technology

IT 6502 — DIGITAL SIGNAL PROCESSING

(Common to Sixth Semester Computer Science and Engineering and Mechatronics Engineering)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you mean by Signal and Signal Processing?

2. What do you mean by convolution?

3. Write N-point DFT for, $x(n)$ and IDFT of $X(k)$.

4. What is meant by radix-2 FFT?

5. Distinguish analog and digital filters.

6. What is meant by impulse invariant method?

7. What are advantages of FIR filter over IIR filter?

8. What condition on the FIR sequence $h(n)$ are to be imposed n order that this filter can be called a linear phase filter? Write the necessary and sufficient condition for the FIR filter to have linear phase.

9. Compare fixed point and floating point representations.

10. Define dead band.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Determine the power and energy of the signal $x(n) = \sin\left(\frac{\pi}{4}\right)n$. (8)

(ii) Determine whether the system described by the input output relation is time invariant or not (8)

(1) $y(n) = x(n-1)$

(2) $y(n) = x(-n)$.

Or

(b) (i) Determine the z transform and ROC of the signal $x(n) = (1/3)^n u(n)$. (8)

(ii) Find the cross correlation of $x(n) = \{1,2,1,1\}$ and $y(n) = \{1,1,2,1\}$. (8)

12. (a) Find the 8 point DFT of the sequence $x(n) = \{1, 1, 1, 1, 1, 1, 0, 0\}$. (16)

Or

(b) Compute the DFT for the sequence {2, 2, 2, 2, 1, 1, 1, 1}. Using radix -2 DIT - FFT algorithm. (16)

13. (a) Design a Butterworth low pass filter satisfying the following constraints.

$$\sqrt{0.5} \le |H(e^{iw})| \le 1, \quad 0 \le w \le \frac{\pi}{2}$$

Use Bilinear transformation

$$|H(e^{jw})| \le 0.2, \quad \frac{3\pi}{4} \le w \le \pi$$

Or

(b) Design an analog Chebyshev filter for the following specifications. Passband gain 0.89. Stop band attenuation 0.2, passband edge frequency 30Hz and stop band edge frequency 75Hz.

14. (a) Design a HPF with cut off frequency 1.2 radians of length N = 9 using Hamming window. (16)

Or

(b) Using frequency sampling method design a lowpass filter with the following specifications cut off frequency, $\omega_c = \pi/4$ and $N = 15$ and plot the magnitude response. (16)

15. (a) Derive the steady state output noise power and Find the steady state variance of the noise in the output due to quantization of input for the first order filter $y(n) = \alpha y(n-1) + x(n)$. (16)

Or

(b) State the need for Scaling and derive the scaling factor for a second order IIR filter. (16)