

MINOR -II-EXAMINATION
(November, 2016)

Subject Code:BCS-301

Subject: Theory of Computation

Time : 1 ½ Hours

Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Please write only to-the-point answers according to the weightage of the question. Do not mention any extra thing, which is not asked in question.

Q1 (2.5,2.5,5)

- (a) What do you mean by inherently ambiguous grammars? Give an example.
 (b) If L_1 and L_2 are two CFL. Prove that $L_1 \cup L_2$ is also CFL.
 (c) Are Deterministic Pushdown Automata and Non-Deterministic Pushdown Automata equivalent? Why/why not discuss.

Q2 (5,5)

- (a) Given a CFG $G = (\{S, A, B\}, \{0\}, P, S)$ with its production set as
 $S \rightarrow AAA / B$, $A \rightarrow 0A / B$, $B \rightarrow \lambda$

Remove null productions from this grammar and create a grammar F , such that $L(F) = L(G) - \lambda$.

- (b) Construct a CFG for $L = \{a^n b^m : n \neq m\}$

Q3 (5,5)

- (a) State and Prove Pumping Lemma for Context Free Languages.
 (b) What is language accepted by the NPDA $M = (\{q_0, q_1, q_2\}, \{a, b\}, \{a, b, z\}, \delta, q_0, z, \{q_2\})$
 $\delta(q_0, a, z) = \{(q_1, a), (q_2, \lambda)\}$
 $\delta(q_1, b, a) = \{(q_1, b)\}$
 $\delta(q_1, b, b) = \{(q_1, b)\}$
 $\delta(q_1, a, b) = \{(q_2, \lambda)\}$
 Explain your answer.

Q4 (5,5)

- (a) Consider the CFG $G = \langle V, T, Q, P \rangle$, where the set of Production Rules is given as
 $Q \rightarrow bQC / b$
 $C \rightarrow cD$
 $D \rightarrow c$

Construct a NPDA / DPDA for it. Demonstrate the correctness of your Automata.

- (b) Consider the grammar whose set of productions is given as follows

$A \rightarrow AA / aAb / bAa / \lambda$

Find whether the grammar is ambiguous or not. Explain your answer.

MINOR – II EXAMINATION
(November-2016)

Subject Code: BIT 303

Subject: Computer Graphics & Multimedia

Time : 1 ½ Hours

Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.**Q1****(2x5=10)**

- (a) Define Hue and Saturation.
- (b) Give the differences between Oblique and Orthographic Projection and list their various categories.
- (c) Explain the Polygon Mesh Shading technique giving its advantages and disadvantages.
- (d) Give the differences between Object precision and Image precision techniques.
- (e) Briefly explain the 'Closure of Operations' property of solid modeling.

Q2**(5,3,2)**

- (a) Describe the Octrees method of solid modeling giving details.
- (b) Explain the CMY and CMY-K color models giving their use and difference.
- (c) Explain Topological Distortion and Vanishing points.

Q3**(6,4)**

- (a) Define Convex Hull and Global Control property in a Bezier Curve. Derive the equation for a 6-point Bezier Curve.
- (b) Describe how A-Buffer Algorithm is different from z-Buffer Algorithm.

Q4**(5,3,2)**

- (a) Derive the matrix for perspective projection onto a plane passing through $R(x_0, y_0, z_0)$ having normal $N = n_1i + n_2j + n_3k$, such that the center of projection is at $C(a, b, c)$.
- (b) Explain the different methods for Polygon Mesh Representation with example.
- (c) In the Phong Illumination Model, explain the role of Ambient Light.

MINOR –II EXAMINATION
(November-2016)

Subject Code: BCS 305

Subject: Microprocessor & Microcontroller

Time : 1 ½ Hours

Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Q1

(2.5x4=10)

- (a) What are the functions of segment registers in 8086?
- (b) What are LOCK and LOCK?
- (c) What are the functions of PSW3 and PSW4 in 8051 microcontroller?
- (d) Write down the contents of following registers after Reset in 8051 microcontroller:
ACC, SP, PSW, DPTR, PC.

Q2

(5,5)

- (a) What are the conditional and control flags of 8086?
- (b) Discuss the main features of 8051 microcontroller. Discuss the area of applications of 8051.

Q3

(5,5)

- (a) Explain conditional and unconditional Jump instructions of 8086.
- (b) Draw and explain the RAM allocation in 8051 microcontroller

Q4

(5,5)

- (a) What is Pipelining, how it is achieved in 8086. What are its advantages?
- (b) Draw and explain the block diagram of 8051 microcontroller.

MINOR – II EXAMINATION
(November-2016)

Subject Code: BIT 309

Subject: Data Warehousing and Data Mining

Time : 1 ½ Hours

Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Q1

(2.5x4=10)

- (a) How do you classify Association Rules?
- (b) Explain two measures of association rule mining.
- (c) Explain mutually exclusive and mutually exhaustive rules with the help of example.
- (d) Explain the solution in detail if a record triggers more than one rule.

Q2

(6,4)

- (a) Apply Apriori algorithm for discovering frequent item sets in the table given below. Also generate association rules from the frequent item sets using minimum confidence as 50% and minimum support value as 0.3.

Trans ID	Items Purchased
101	Milk, bread , eggs
102	Milk, Juice
103	Juice, Butter
104	Milk, bread , eggs
105	Coffee, Eggs
106	Coffee
107	Juice, Coffee
108	Milk, bread, cookies, eggs
109	Cookies, butter
110	Milk

- (b) Explain the aspects of sequential covering algorithm with the help of small example.

Q3

(7,3)

- (a) What is bayes theorem? Explain Naïve bayes classification in detail.
- (b) Explain density based clustering method.

Q4

(6,4)

- (a) Consider the five points $\{x_1, x_2, x_3, x_4, x_5\}$ for the following coordinates as a two dimensional sample for clustering: $x_1=(0,2.5)$; $x_2=(0,0)$; $x_3=(1.5,0)$; $x_4=(5,0)$; $x_5=(5,2)$. Illustrate the K- Means partitioning clustering algorithm using the above data set.
- (b) Explain decision tree learning algorithm.

MINOR - II EXAMINATION
(November, 2016)

Subject Code: BIT 307

Subject: Data Communication & Computer
Networks

Time : 1 ½ Hours

Maximum Marks : 30

Note: Q. 1 is compulsory. Attempt any two questions from the rest.

Q1

(2.5x4=10)

- (a) A bit stream of 101110101 is to be transmitted using the standard CRC method having x^3+1 as the generator polynomial. Show the actual bits transmitted. If suppose the 6th bit from the left gets inverted due to an error, check whether the error can be caught.
- (b) Consider a CSMA/CD network running at 1 Gbps over 1 km cable with no repeaters. The signal speed of the channel is 200,000 km/sec. What is the minimum frame size?
- (c) Briefly explain the MACAW protocol used in wireless LANs.
- (d) Convert the IP address whose hexadecimal representation is A22F0F31 to dotted decimal representation. Find the class to which the address belongs to.

Q2

(5,5)

- (a) Explain briefly the following fields of the IP header: Internet Header Length (IHL), Identification, DF & MF, and TTL.
- (b) i) What does the following address mean and when are they used?
- 0.0.0.0
 - 255.255.255.255
- ii) What is the baud rate of the standard 10-Mbps Ethernet? Sketch the Manchester encoding for the bit stream 0001110101.

Q3

(5,5)

- (a) i) Briefly discuss 1-persistence, p-persistence and non-persistence CSMA.
ii) Why is the minimum frame size of 10Base5 Ethernet frame fixed at 64 bytes?
- (b) i) ARP and RARP both maps addresses from one space to another. In that respect, they are similar. However, their implementations are fundamentally different. In what major ways do they differ?
ii) Briefly explain the working of DHCP.

Q4

(5,5)

- (a) i) A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle?
ii) Briefly explain any four ICMP message types.
- (b) Consider the following scenario. Distance vector routing is used, and the following information have just arrived at the router C: from B: (8,0,5,7,6,4); from D: (5,8,10,0,8,5); and from E: (10,6,13,5,0,14). The measured delays to B, D, and E, are 7, 6, and 3 respectively. Give the new routing table for C specifying both the delay and the outgoing line to use.