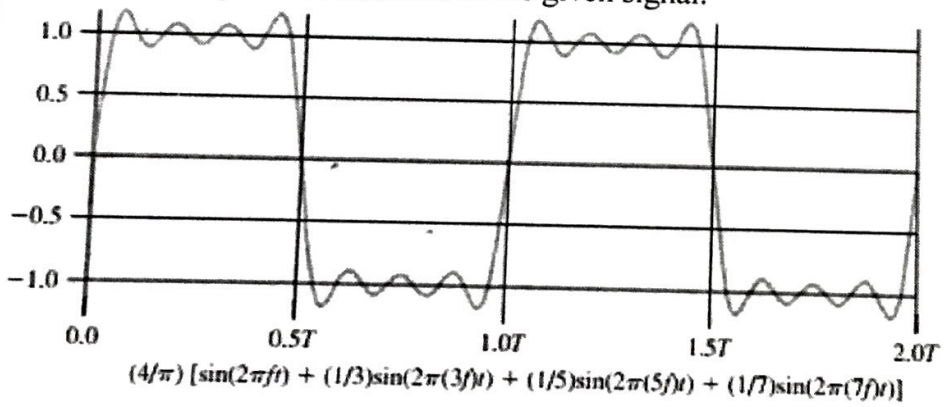
Computer Science and Engineering Discipline

Course: **CSE 4111,** Course Title: **Computer Networks**

Class Test: **1,** Time: **50 minutes,** Marks: **30**

Answer any two (2) of the following three (3) questions.

1.	**(a)** Briefly explain the relationships of client-server and peer-to-peer networking model. **(b)** Differentiate connection oriented and connection less services. **(c)** What are the layers of OSI reference model? Describe the internet layer of TCP/IP reference model.	**5** **5** **5**
2.	**(a)** Suppose that a color TV picture is to be transmitted from a source that uses a matrix of 640x480 picture elements (pixels). If a Color TV uses 3 separate RGB pixels to represent one color pixel, where each RGB pixel can take one of 128 color values then find the source data rate (bps). **(b)** Assume that the TV picture is to be transmitted over a channel with 5 MHz bandwidth and 15 dB signal-to-noise ratio. Find the capacity of the channel (bps). **(c)** Discuss whether the TV signal of a) can be transmitted through the channel of b)? If not how the parameters of a) can be modified to allow the transmission?	**5** **5** **5**
3.	**(a)** Draw the frequency domain of the following time domain signal. Also find out the spectrum, absolute bandwidth and possible data rate of the given signal.  $(4/\pi)\,[\sin(2\pi ft) + (1/3)\sin(2\pi(3f)t) + (1/5)\sin(2\pi(5f)t) + (1/7)\sin(2\pi(7f)t)]$ **(b)** Let us consider that the spectrum of a channel is between 2 MHz and 5 MHz and $SNR_{dB} = 27$ dB. What is the maximum channel capacity? How many signaling levels will be required to achieve this maximum capacity?	**8** **7**

000+-0-+
-000-+0+-

	O	E
−	000-	+00+
+	000+	-00-

Computer Science and Engineering Discipline
Course: **CSE 4111,** Course Title: **Computer Networks**
Class Test: **2,** Time: **60 minutes,** Marks: **30**

Answer all the following questions.

1.	Draw the digital encoded signals of the following bit stream using **Differential Manchester**, **B8ZS** and **HDB3** encoding schemes. a. **1 0 1 0 0 0 0 0 0 0 0 1 0 0 0 0 1**	**10**
2.	Modulate the following digital bit stream to analog signals using **ASK**, **BFSK**, and **QPSK** modulation techniques. a. **1 0 0 0 1 1 0 1 1 0 1 1**	**10**
3.	a) Draw any analog signal, where the highest frequency of the signal is 4Hz. If you take 10 quantization levels, what would be the PCM code of the signal? b) Design a new digital to analog modulation technique, where you combine BPSK, ASK and BFSK. How many bits can be supported by each signal element for your new technique? **(5 Bonus Marks)**	**6** **4**

iii. Code Generator

CSE – 4125 CT-1 Marks – 30 Time – 40 Mininute

Geometry.

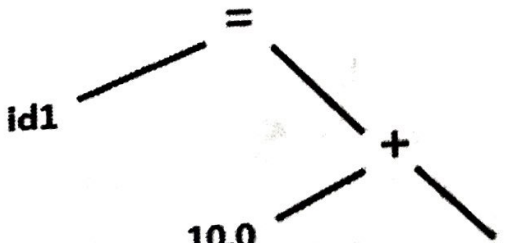
Q1. What are the events in the plane sweep algorithm and how are they handled? (10)

Q2. Prove that a simple polygon with n vertices can always be triangulated, and always with n − 2 triangles. (8)

Q3. Describe how a simple polygon can be broken into pieces of y-monotone polygons. (12)

numbers, write the output of the following phases:

i. Lexical Analyzer
ii. Intermediate Code Generator and
iii. Code Generator



Computer Science & Engineering Discipline
First Assessment of Compiler Design
[Do not forget to write your student ID in the answer script]

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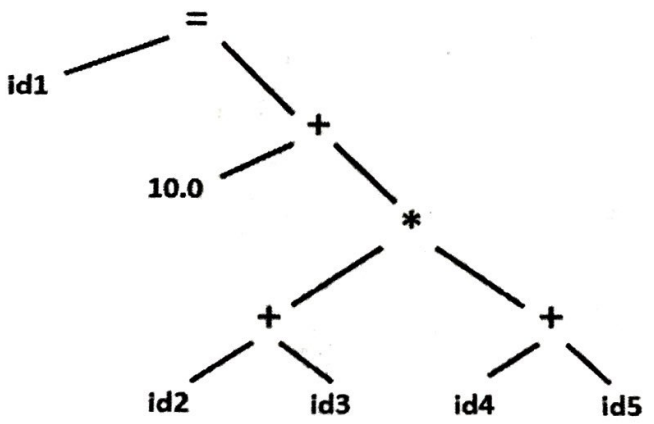
01. The phases, syntax analyzer and semantic analyzer can be combined into a single phase. Do you agree or disagree? Why? **4**

02. The following one is the output of a Syntax Analyzer. If id1, id2, id3, id4 and id5 are integer numbers, write the output of the following phases: **9**

i. Lexical Analyzer
ii. Intermediate Code Generator and
iii. Code Generator



03. Why parenthesis is not necessary in postfix expression? **2**

Computer Science and Engineering Discipline
Final Assessment of Compiler D...n
Time: 15 Minutes (Sharp)

Eliminate left recursion (if any), perform left fac oring (if applicable) and compute FIRST and FOLLOW.

$$Z \rightarrow E$$
$$E \rightarrow T \mid E + T \mid E - T$$
$$T \rightarrow F \mid T * F \mid T/F$$
$$F \rightarrow a \mid (E)$$

drawn balls are black?

$$P(S|F) = \frac{P(SF)}{P(F)} = \frac{P(SF)}{\frac{1}{2}} =$$

7B 5W

$$P(SF) = P(S)P(F)$$
$$= \frac{7}{12} \times \frac{6}{11}$$

Computer Graphics

Class test: 2 Marks: 30 Time: 40 minutes

1. Derive the transformation that rotates a 2D object point θ^0 about the origin.
2. Reflect the polygon whose vertices are $A(0, -2)$, $B(1, 0)$, $C0, 2)$, and $D(-1, 0)$ about the line $y = x + 3$
3. Find the condition under which we have $S_{sx,sy} . R_\theta = R_\theta . S_{sx,sy}$.

ball in the urn is equally [illegible]

drawn, what is the probability that both drawn balls are black?

7B 5W

$P(SF) = \frac{P(SF)}{\quad} = \frac{P(SF)}{\quad} =$

$P(SF) = P(S)P(F)$

$= \frac{7}{\quad} \times \frac{6}{11}$

Computer Graphics

lass test: 3 **Marks: 30** **Time: 30 minutes**

1. Suppose a 2-dimensional clipping rectangle has its lower left corner at (10, 5) and its upper right corner at (100, 90). Simulate the Cohen-Sutherland algorithm on each of the following line segments:
(a) *P1(20, 10) –P2(95, 70)*
(b) *Q1(30, 60) –Q2(70, 100)*
(c) *R1(95, 140) –R2(170, 85)*

2. Define Viewing transformation. Find the normalization transformation which uses a circle of radius four units and center (2, 2) as a window and a circle of radius ½ and center (1/2, 1/2) as a viewport.

drawn, what is the probability that both drawn balls are black?

7B 5W

$P(SF) = P(S)P(F)$

CSE-4121
1st Class Test
Marks: 10, Time: 30 min

1. State Bayes' Formula ——— (05)

2. Suppose an urn contains seven black balls and five white balls. We draw two balls from the urn without replacement. Assuming that each ball in the urn is equally likely to be drawn, what is the probability that both drawn balls are black? (05)

7B 5W

$$P(S|F) = \frac{P(SF)}{P(F)} = \frac{P(SF)}{\frac{1}{2}}$$

$$P(SF) = P(S)P(F) = \frac{7}{12} \times \frac{6}{11} \cdots$$

Derive the mean of exponential random variable

maybe.

2.3 Sample 3, 6 -

(1, 6 -)