(42)

Total no. of pages: 1 Roll No.:_____

FourthSemester BE CE

Mid Semester Examination February 2019

CEC-11 Software Engineering

Time: 1:30 hrs Max Marks: 15

Note: Attempt all questions. Assume missing data, if any.

1. Why software development has to follow systematic approach. What is importance of software engineering? (2)
2. What do you understand by term process model? Which process is suitable according to you for MRI scanning software and why? (2)
3. Differentiate between waterfall model and prototype model. (2)
4. What is requirement elicitation? Mention any five and explain any two requirement elicitation techniques. (2)
5. What is SRS? Write any one SRS format. (2)

   Or

   Explain what is data dictionary with the help of an example.
6. Explain briefly the spiral model. What is the unique feature of this model? (2)
7. Draw ER diagram/DFD for the following problem statement. (3)

Information about every airplane is maintained in airport management system. Information of each airplane is stored such as registration number, type and hangar in which an airplane is kept. Each hangar has a number, capacity and a location. The information regarding the owner of the plane is also kept. Each plane undergoes service many times and service record is maintained which has information regarding the date of maintenance, no. of hours spent on the work and the type of work done. Each airplane has a pilot who has flying license and information regarding pilot name, social security number, license no., address etc. All kinds of planes are not allowed to land on the airport. Only those planes which are registered with the airport are allowed to land. For emergency landing the pilot of the plane has to seek permission from the airport authority to land. If permission is granted only then plane can be landed on the airport.

Total No. of Page(s): ...1...

Roll No.....

B.E. (COE)

FOURTH SEMESTER

B.E. MID SEM. EXAMINATION, FEB -2019

CE-12 COMPUTER GRAPHICS

Time: 1:30 Hrs. Max. Marks: 15

Note: Attempt **ALL THREE** questions. Each question carries equal marks. Assume missing data, if exist any

Q1. (a) Polygon ABCDEF and a line Q_1Q_2 is given. Coordinates of polygon vertices are **A(3, 2), B(5, 6), C(8, 5), D(10, 7), E(8, 1)** and **F(6, 3).** Line end point coordinates are Q_1**(2, 3)** and Q_2**(10, 1).** Write **CYRUS BECK** line clipping algorithm. Show the steps of clipping a polygon ABCDEF with line Q_1Q_2 (using the algorithm).

(b)Line $x + 4y = 7$ is given. Write a function (name as **LEFT(point p),** which returns TRUE or FALSE, if the point 'p' lies on the left side of the line. Prove the validity of your function with an example. **[4, 1]**

Q2. (a) Polygon $P_1P_2P_3P_4$ is a Clipping Window and $V_1V_2V_3V_4$ is a Subject polygon. Vertices of polygon $P_1P_2P_3P_4$ are P_1**(3, 4),** P_2**(12, 7),** P_3**(10, 1)** and P_4**(2, 3).** Similarly vertices of polygon $V_1V_2V_3V_4$ are V_1**(3, 2),** V_2**(5, 6),** V_3**(10, 7)** and V_4**(8, 1).** Write **WEILER & ATHERTON** algorithm to clip the Subject Polygon, and then show the steps of simulation in clipping the Subject polygon.

(b)Find the Composite transformation matrix that can transform a Rectangle to a Unit square (whose one of the vertex is at origin). Rectangle ABCD, whose coordinates are **A(0, 3), B(-3, 6), C(-1, 8)** and **D(2, 5).** **[4, 1]**

Q3. (a) In SEED filling algorithm one basic requirement is SEED point. Write a function **GENERATE-SEED(POLY P)** that randomly generates a seed point. Show with example the validity of your function for the polygon ABCDEF of Q1.

(b) Derive an approach for Ellipse drawing using Bresenham's Approach (by both 1st differential and 2nd differential). Write the algorithm and also show the steps of simulation. **[2, 3]**

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Total no. of pages: 1 Roll no. .....

BE (CO) 4th SEMESTER
MID SEMESTER EXAMINATION, FEB- 2019
CEC14: OPERATING SYSTEMS

Time: 1:30 Hrs. Max Marks: 25

Note: Attempt all questions. Assume any missing data if any.

Q.1. Explain the following (any three). Give suitable examples. [4x3=12]

a) Address binding and Dynamic linking.
b) Context switching – Role and overloads.
c) Scheduler's and its performance parameters.
d) Paging with TLB.
e) Fragmentation in different memory schemes.

Q.2. Five Batch jobs A through E, arrives at a computer centre at almost the same time. They have estimated running time of 10, 6, 2, 4 and 8 minutes. Their priorities are 3, 5, 2, 1 and 4 respectively with 5 being the highest priority. For each of the following scheduling algorithms determine the average weighting time and average turnaround time.

a) Round Robin
b) Priority
c) First come first served
d) Shortest job first

Q.3. What are threads? Explain differences between user level threads and kernel le threads. Give suitable examples.

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Roll No. .....

Name of Examination: **B. E. (COE) IV Sem Mid Term 2019**

Subject/Name of course: **Computer Networking**

Time: **90 Minutes** Paper No.: **CEC13** Max. Marks:**15**

nstruction to candidates:

1. Write your **Roll No.** on the top immediately on receipt of this question paper.
2. Marks are specified against the questions.
3. Assume suitable missing data, if any. Attempt question in order only.

S. No.	Question	Marks /COs
1	An image is 1600 × 1200 pixels with 5 bytes/pixel. Assume the image is uncompressed. Calculate the time it will take to transmit it over 1 gigabit ethernet.	1/CO1
2	Explain the difference between Radio Transmission and Microwave transmission in terms of the frequency ranges, their ability to pass through solid objects, the distance and direction of their propagation, and their applications.	1/CO1
3	The following data fragment occurs in the middle of a data stream for which the byte stuffing algorithm is used: A B ESC B ESC ESC FLAG A. The following character encoding is used in a data link protocol: A: 01000111 B: 11100011 FLAG: 01111110 ESC: 11100000 Determine the output bit sequence after byte stuffing.	1/C02
4	If the Sender Window size is 128 using selective repeat ARQ. Compute the sequence number of frame to be send after sending 400th frame.	1/C02
5	Write the gcc command to genearate an executable namely "netsniff", which can be debugged by gdb(if needed), from a C file "netsniff.c". C source file uses functions available in "libpcap.so" library file that is present in "exam" directory under the home directory of user "xyz". If a user "abc" has stopped some process by pressing ctrl+z key combination, write the commands he will use to terminate that process?	1/CO3
6	Write a C program that (1) repeatedly executes a function "compute()" in a loop being controlled by an integer variable "done", (2) after receiving the SIGUSR1 signal, being handled by "sig_handler" function, comes out of the loop mentioned in part (1), (3) executes the function finalize(), and terminates with an exit status equal to the return value from the finalize() function.	2/CO1
7	Consider a pipelined, reliable transport protocol that uses Go-Back-N with cumulative acknowledgments. Assume that timeouts trigger retransmissions and that the receiver does not maintain any receive buffer. If the one-way delay between the sender and receiver is 50 ms and every frame is 10,000 bits long, answer the following how big must the window be to allow the sender to send at a steady rate of 1 Gb/s under ideal conditions? Suppose that approximately one packet in 100,000 is lost. If the sender uses a timeout of 500 ms and a window size of 20,000 packets, how often does sender experience a timeout? How many packets will it retransmit when a time out occurs?	2/C01

P.T.O.

8	A codebook has the following four codewords: 000110 ; 011011 ; 101100 ; 110001 (a) What is the minimum Hamming distance of this codebook? (b) How many channel errors is this code guaranteed to detect? (c) How many channel errors is this code guaranteed to correct? (d) If the codeword 100110 is received, what codeword was most likely to have been transmitted?	2/CO2
9	If **010111** is one of the code words generated by generator polynomial x^4+x^2+x+1, **show** that all 2-bit error patterns can be detected for the corresponding codebook. If we wish to send 1,000 bytes per second through an 800 Hz wide channel, what is the minimum signal to noise ratio in decibels?	2/C03
10	If a word (0 1 0 0 1 1 0 1 1) encoded using Hamming Code Even Parity scheme is received, is there any error? Find the data word used to generate the correct code word. What is the checksum of four words: 1100, 1011, 1001, 0110? Which frequencies are used by a dual band Wifi Router? How many pairs of wire are present in the CAT 6 cables?	2/C03

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IV SEMESTER B.Tech

MID-SEMESTER EXAMINATION 2022

Course Code- COECC12/ CAECC12/ CDCC12 Course Title- **Data Communication**

Time: 1:30 minutes Max Marks: 15

Attempt all questions. Missing data / information (If any) may be suitably assumed & mentioned in the answer.

Q. No.		Questions	Marks	CO
Q1	a	Suppose two signals are expressed as $S_1(t) = 2, \quad 0 < t < 2$ and $S_2(t) = -3, \quad 1 < t < 2$ Apply the Gram-Schmidt procedure and find and express the signals in terms of basis signals.	2	CO1
	b	Compare instantaneous, natural, and flat top sampling techniques.	1	CO1
Q2	a	A signal with maximum frequency of 200 Hz is sampled at 2.5 times the Nyquist rate. Assuming a quantizer with 100 levels, what would be the bitrate of the PCM signal?	2	CO1
	b	Explain a method to generate and demodulate QPSK wave.	1	CO2
Q3	a	An on-off binary system uses the pulse waveforms $s_i(t) = \begin{cases} s_1(t) = A\sin\frac{\pi t}{T}, 0 \le t \le T \\ s_2(t) = 0, 0 \le t \le T \end{cases}$ Let A=0.2mV and T=2us. Additive white noise with a power spectral density $\frac{N_o}{2} = \frac{10^{-15}W}{Hz}$ is added to the signal. Determine the probability of error when $P(s_1) = P(s_2) = 1/2$.	2	CO2
	b	For the periodic signal $x(t) = 4 + 2\cos(3t) + 3\sin(4t)$. Find the exponential Fourier series.	1	CO1
Q4	a	What is aliasing? Suggest a method to overcome it.	1	CO1
	b	If equiprobable symbols are transmitted in presence of additive White Gaussian Noise, the maximum likelihood criteria converge to minimum distance criteria. With proper justification state whether the statement is true or false.	2	CO2
Q5	a	For a (6,3) systematic linear block code, the three parity check bits are formed from following equations $c_4 = d_1 \oplus d_3$ $c_5 = d_1 \oplus d_2 \oplus d_3$ $c_6 = d_1 \oplus d_2$ a. Write down the generator matrix. b. Construct all possible codes.	2	CO2
	b	In a binary PCM system, for a sinusoidal signal the output signal to quantization noise ratio is to be kept to a minimum of 40dB. Determine the number of required levels and find the corresponding output signal-to-noise quantizing -noise ratio.	1	CO2

B.Tech. (CSE/CSAI/CSDS/MAC) 4th Semester and B.Tech. (ICE/EE) 6th Semester
MID-SEMESTER EXAMINATION, FEB-MARCH, 2022

Course Code: COCSC09/CACSC09/CDCSC09/CMCSC09
Course Title: Operating System

Time: 1.5 Hrs. Max. Marks: 15

Note: Attempt ALL FIVE questions. Missing data/information, if any, may be suitably assumed and mentioned in the answer.

<table>
<tr><th>Q. No.</th><th>Question</th><th>Marks</th><th>CO</th></tr>
<tr><td>1a</td><td>Draw the structure of PCB. Explain how it is used during context switching between two concurrently running processes.</td><td>2</td><td>CO2</td></tr>
<tr><td>1b</td><td>Which of the functionalities listed below need to be supported by the operating system for Real–time systems and Hand-held devices?
1.Batch programming
2.Virtual memory</td><td>1</td><td>CO1</td></tr>
<tr><td>2a</td><td>Consider the following scenario of processes with their priority.
<table>
<tr><th>Process</th><th>Arrival Time (ms)</th><th>Execution Time (ms)</th><th>Priority</th></tr>
<tr><td>P1</td><td>0</td><td>12</td><td>5 (highest)</td></tr>
<tr><td>P2</td><td>2</td><td>25</td><td>1</td></tr>
<tr><td>P3</td><td>3</td><td>3</td><td>3</td></tr>
<tr><td>P4</td><td>5</td><td>9</td><td>4</td></tr>
<tr><td>P5</td><td>6</td><td>13</td><td>2</td></tr>
</table>
Draw the Gantt chart for the execution of the processes, showing their start time and end time, using priority based scheduling. Calculate turnaround time and waiting time for each process and average turnaround time and average waiting time for the system.</td><td>2</td><td>CO2</td></tr>
<tr><td>2b</td><td>If a process terminates, will its threads also terminate or will they continue to run? Explain your answer.</td><td>1</td><td>CO2</td></tr>
<tr><td>3a</td><td>Describe three general methods for passing parameters to the operating system.</td><td>2</td><td>CO1</td></tr>
<tr><td>3b</td><td>What is the difference between scheduler and dispatcher and how do they work?</td><td>1</td><td>CO2</td></tr>
<tr><td>4a</td><td>Describe the differences between symmetric and asymmetric multiprocessing. What are the advantages and disadvantage of multiprocessor systems?</td><td>2</td><td>CO1</td></tr>
<tr><td>4b</td><td>In what ways is the modular kernel approach similar to the layered approach? In what ways does it differ from the layered approach?</td><td>1</td><td>CO1</td></tr>
<tr><td>5a</td><td>What are two differences between user-level threads and kernel-level threads? Under what circumstances is one type better than the other?</td><td>2</td><td>CO2</td></tr>
<tr><td>5b</td><td>Why do we use an interrupt controller? Explain how it works?</td><td>1</td><td>CO1</td></tr>
</table>

Fourth Semester–B. TECH

MID-SEMESTER EXAMINATION, FEBRUARY-MARCH 2022

Course Code: COMTC13/ CAMTC13/CBMTC13/CDMTC13

Course Title: Probability and Stochastic Processes

Time: 1:30 Hours | Max. Marks: 25

Note: Attempt all questions. Missing data/information (if any), may be suitably assumed & mentioned in the answer.

Q. No.		Question Marks	CO
1a	If the joint density function of random variables X and Y is $$f_X(x) = \begin{cases} \frac{x^3y^3}{16}; 0 \le x \le 2, 0 \le y \le 2 \\ 0 \ ; \text{otherwise} \end{cases}$$ Then find the marginal density function of X and hence find the E[X – 2].	2.5	CO2
1b	Prove that if *X* follows Hyper-geometric distribution with parameters *r*, *n* and *N*, then *X* follows a Binomial distribution when k → ∞, N → ∞ and (k /N) → p $$P[X = x] = \binom{n}{x} p^x(1-p)^{n-x}.$$	2.5	CO2
2a	If Y_1, Y_2 and Y_3 are independent random variable with their means 4, 9, and 3 and the variances 3, 7, and 5, respectively. Then find out the mean and variance of the random variable: $Y - 8 = 2Y_1 - 3Y_2 + 4Y_3$.	2.5	CO1
2b	Fit a normal distribution to the random variable X representing weight using the method of areas to the following frequency distribution and hence find the theoretical/expected frequency (only for first four class interval).	2.5	CO2

	<table><tr><th>weight</th><th>f(x)</th></tr><tr><td>120-130</td><td>1</td></tr><tr><td>130-140</td><td>1</td></tr><tr><td>140-150</td><td>14</td></tr><tr><td>150-160</td><td>22</td></tr><tr><td>160-170</td><td>25</td></tr><tr><td>170-180</td><td>19</td></tr><tr><td>180-190</td><td>13</td></tr><tr><td>190-200</td><td>3</td></tr><tr><td>200-210</td><td>2</td></tr><tr><td>Total</td><td>100</td></tr></table> The mean and variance of X is given as 165.5 and 15.26 respectively.		
3a	A continuous random variable X that can assume any value between x = 2 and x = 5 has a probability density function given by f(x) = k(1 + x). Find P(X < 4).	2.5	CO1
3b	Define Beta distribution of first kind and find its mean.	2.5	CO2
4a	Two defective tubes get mixed up with 2 good ones. The tubes are tested, one by one, until both defectives are found. What is the probability that the last defective tube is obtained on the second test.	2.5	CO1
4b	If the probability density function of X is given by $f_X(x) = \begin{cases} 6x(1-x);\ 0 < x < 1 \\ 0;\ \text{otherwise} \end{cases}$. Find the pdf of $Y = X^2$.	2.5	CO1
5a	The first three moments of a distribution about the value 2 of the random variable X are 1, 16, and −40. Find the mean and variance of X.	2.5	CO1
5b	A continuous random variable X has the probability density function, $f_X(x) = \begin{cases} e^{-x};\ x \geq 0 \\ 0;\ \text{otherwise} \end{cases}$. Show that the Tchebycheff's inequality gives $P[\lvert X-1\rvert > 2] < 1/4$.	2.5	CO2

FOURTH SEMESTER- B. TECH

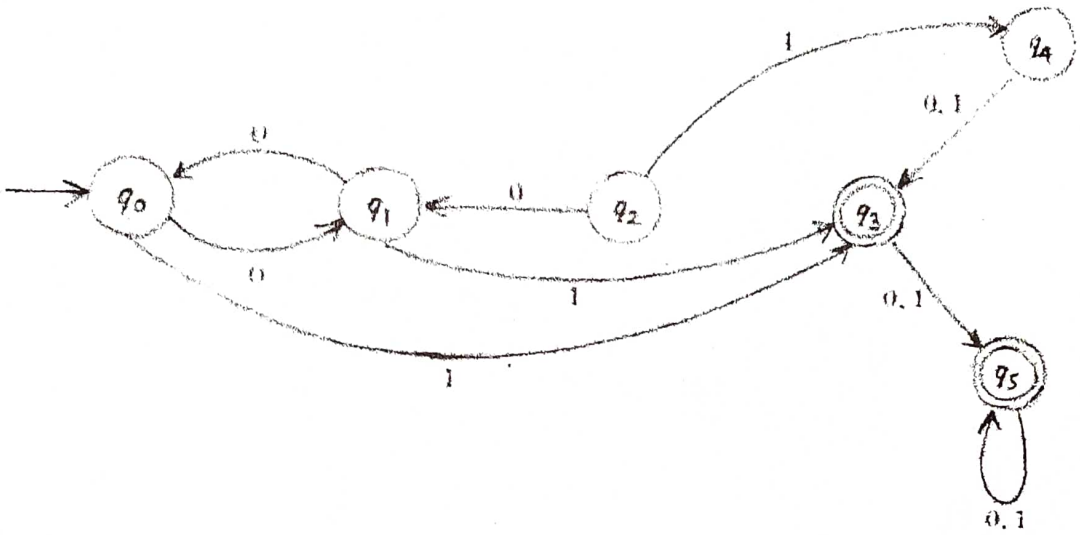
MID-SEMESTER EXAMINATION, March, 2022

Course Code: CACSC10, CDCSC10, COCSC10, CMCSC10

Course Title: Theory of Automata and Formal Languages

Time: 1hr 30 mins. Max.Marks:25

Note: - Attempt all questions. Missing data/information (if any), may be suitably assumed and mentioned in the answer.

Q1	a) What is Kleen closure. Given the language L = {ab, aa, baa}, explain the difference between L* and L^+. b) Find the equivalent minimal DFA for the DFA given below showing all the steps followed. 	2.5+2.5	CO1, CO2
Q2	a) Construct DFA for the language accepting strings containing neither '00' nor '11' as substring over input alphabets ∑ = {0, 1}. Write the regular expression for the same. b) Draw NFA for regular expression (a+b)* b (a+b). Consider the states name in NFA as A, B, C and so on. Convert the above-mentioned NFA into DFA	2.5+2.5	CO1, CO2
Q3	a) Consider the grammar S->0B|1A A->0|0S|1AA B->1|1S|0BB Find leftmost derivation, rightmost derivation and derivation tree for the string 001101. Is this grammar ambiguous? Justify your answer. b) Explain Decision properties of Regular Languages.	2.5+2.5	CO2
Q4	a) Prove L = $\{0^n110^n \mid n \geq 1\}$ is regular/not regular using Pumping Lemma b) Construct a Mealy machine with ∑={a, b} which can output even, odd according to the total number of a's encountered is even/odd. Convert the obtained Mealy machine to Moore machine.	2.5+2.5	CO2
Q5	a) Construct Context free grammar G such that L(G)={w ∈ {a, b}|w has equal number of a's and b's} For the string aaabbb is this grammar ambiguous? b) State whether the Regular Expression (ab+a)*ab = (aa*b)* is equivalent or not. Prove by showing examples of strings.	2.5+2.5	CO2