DMCA201

M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

SOFTWARE ENGINEERING

Time : 3 Hours   **Maximum Marks : 70**

SECTION - A

Answer any THREE questions.   **(3X15 = 45)**

Q1)   What is the importance of process model in development of softwafe system? Explain. Spiral model and describe its advantages over water fall model.

Q2)   What is Software Requirement Specification (SRS)? Why is it important? List the characteristic of a good quality SRS? What contents can we include in it?

Q3)   What are the characteristics of a good design? Decribe different types of coupling and cohesion. How design evaluation is performed?

Q4) a) Explain Unit Testing and System Testing.
   b) Explain the testing procedures for boundary   conditions.

Q5) a) Give the differentiate between metrics and   measurement.
   b) Discuss COCOMO model with an illustrative example.

SECTION - B

Answer any Five questions from the following. *(5X4 = 20)*

Q6)   What are the different phases of software   engineering?

Q7)   Which is more important-the product or process? Justify your answer.

Q8)   What is the prototyping technique? How prototype models are prepared for a software process?

Q9)   With an example explain about DFD.

Q10)   Explain data architectural and procedural design for a software?

Q11)   Describe the golden rules for interface design.

Q12)   Explain the verification and validation (V&V) process.

Q13)   Explain about function point metric in detail.

SECTION - C

Q14) Define software process.

Q15) Give the example for non-functional requirements of software.

Q16) Distinguish between horizontal and vertical partitioning?

Q17) What is cyclomatic complexity?

Q18) What is meant by prototyping?

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DMCA202

M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

PROGRAMMING WITH JAVA

Time : 3 Hours   **Maximum Marks : 70**

SECTION - A

Answer any THREE questions   *(3X15 = 45)*

Q1) a) Write the structure of Java program and how to compile and execute Java program.

   b) Write a Java program that demonstrate any two string handling functions.

Q2) Differentiate method overloading with method overriding with examples.

Q3) What is inheritance? How to create it and access it? Explain different forms of inheritance in Java with examples.

Q4) What are the various types of exceptions available in Java? Also discuss on how they are handled?

Q5) Discuss in detail about Applet life cycle. How to pass the parameters to an Applet? Explain with example.

SECTION - B

Answer any Five questions from the following *(5X4 = 20)*

Q6) Write the table that shows the precedence of operators in Java.

Q7) How to assign the values to the variables in the class at the time of creation of object to that class?

Q8) Write about nested classes with syntax and example.

Q9) What is a constructor? When does the compiler supply default constructor for a class?

Q10) What is the use of 'super' and 'static' keywords?

Q11) How garbage collector plays its role? Explain.

Q12) What is a stream? What is the difference between byte streams and character streams?

Q13) Write about Menu bars and menus in Java with examples.

SECTION - C

Q14)   Define encapsulation.

Q15)   Define multi-threading.

Q16)   Define type casting.

Q17)   What is Java Virtual Machine?

Q18)   What is an event? List down any two events.

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M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

COMPUTER NETWORKING

Time : 3 Hours   **Maximum Marks : 70**

SECTION - A

Answer any THREE questions from the following:**(3X15 = 45)**

Q1) A bit stream 110101011 is transmitted using   standard CRC method. The generator polynomial is $x^4 + x + 1$. Show the actual bit string transmitted. Also explain the error detecting and correcting code with example.

Q2) Discuss different issues in Local Area Networks and Wireless Networks.

Q3) What is Bridge? Explain about Transparent bridges and source routing bridges.

Q4) Explain about distance vector routing and link state routing algorithm.

Q5) Draw IP headed and explain each field of the header. How the IP address is calculated?

SECTION - B

Answer any Five questions from the following.   **(5X4 = 20)**

Q6) Write about Even and odd parity checking.

Q7) Explain about ring and bus network topologies.

Q8) Differentiate guided and unguided transmission media?

Q9) Describe the working of sliding window protocol.

Q10) Write note on CDMA and FDMA.

Q11) Explain ALOHA system. How slotted ALOHA works?

Q12) Write about time division switching and space division switching.

Q13) Explain the basic functions of the e-mail system.

SECTION - C

Q14) Define signaling.

Q15) What is modem?

Q16) What is router?

Q17) What is meant by network threat?

Q18) Define congestion.

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M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

COMPUTER ALGORITHMS

Time : 3 Hours   **Maximum Marks : 70**

SECTION - A

Answer any THREE questions.   *(3X15 = 45)*

Q1) Differentiate between Big O and Omega (Ω) notation with example. Give the algorithm for matrix multiplication and find the time complexity of the algorithm using step-count method.

Q2) Apply Merge sort algorithm on the following elements using divide and conquer method. Give the output of each pass and also derive its time complexity.

   27, 6, 18, 25, 48, 59, 98, 34

Q3) Find out the number of scalar multiplications needed to multiply the following chain of matrices using dynamic programming.
$A_1(5 \times 50) \times A_2(50 \times 10) \times A_3(10 \times 20) \times A_4(20 \times 10)$

Q4) Following are the details of various jobs to be scheduled on multiple processors such that no two processes execute at the same on the same processor.

Jobs	J_1	J_2	J_3	J_4	J_5	J_6	J_7
Start time	0	3	4	9	7	1	6
Finish time	2	7	7	11	10	5	8

How schedule of these jobs on minimum number of processors using greedy approach.

Derive an algorithm for the same.

Q5) Solve the following instance of the Knapsack problem using branch and bound algorithm with $W = 16$.

Item	Weight	Value	Value/Weight
1	4	40	10
2	7	42	6
3	5	25	5
4	3	12	4

SECTION - B

Answer any Five questions from the following.*(5X4 = 20)*

Q6) Briefly explain about amortized analysis.

Q7) Describe different disjoint set operations with example.

Q8) Give the equations for perform Strassen's matrix multiplication.

Q9) Write about Huffman tree procedure.

Q10) Solve the all-pair shortest path problems for given adjacent matrix graph using Floyd's Algorithm.

Q11) Write and explain sum of sub set algorithm with   n = 4, w = {2, 7, 8, 15}, m = 17

Q12) What is a Backtracking and give the 4 - Queens' solution.

Q13) What is the general strategy of Branch and Bound method?

SECTION - C

Answer All Questions.   *(5X1 = 5)*

Q14) Define space complexity.

Q15) What are the best and worst case time complexities of quick sort?

Q16) Define principle of optimality.

Q17) Define spanning tree.

Q18) What is meant by back tracking?

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M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

DISTRIBUTED OPERATING SYSTEMS

Time : 3 Hours   **Maximum Marks : 70**

SECTION - A

Answer any THREE questions   *(3X15 = 45)*

Q1)   Explain about the Bus-based Multiprocessors, Switched multiprocessors, Bus-based Multicomputers and Swtiched Multicomputers.

Q2)   Explain about the Asynchronous Transfer Mode Networks.

Q3)   Explain about the Clock Synchronization.

Q4)   Explain about the implementation issues for Processor Allocation Algorithms.

Q5)   Explain about the NFS architecture, the protocol, and the implementation of NFS.

SECTION - B

Answer any Five questions from the following *(5X4 = 20)*

Q6)   Discuss about the motivation and goals of typical distributed systems.

Q7)   Explain about the Disadvantages of Distributed Systems.

Q8)   Explain about Client-Server Model.

Q9)   Explain about the Group Communication design issues.

Q10)   Explain about the Private Workspace and writeahead log.

Q11)   Explain about Operation of the up-down algorithm.

Q12)   Name two useful properties that immutable files have.

Q13)   What is the difference between a file service using the upload/download model and one using the   remote access model?

SECTION - C

Q14)   What is Migration transparency?

Q15)   What is the difference between a connection- oriented and connectionless communication protocol?

Q16)   Explain about the Token ring mutual exclusion algorithm.

Q17)   What is clock skew?

Q18)   What is replication transparent?

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M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

COMPUTER GRAPHICS

Time : 3 Hours   **Maximum Marks : 70**

<u>SECTION - A</u>   *(3 x 15 = 45)*

<u>Answer any THREE Questions</u>

Q1) Derive all necessary formulas for Bresenham line drawing algorithm. Bresenham line drawing algorithm is used to draw a line from (1, 2) to (7, 5). Determine all the pixels which will be on as the line is drawn.

Q2) Consider a rectangle with left bottom corner at (0, 0) and right top corner at (8, 4). Clip the line P_1P_2 with vertices P_1(-1, 1) and P_2 (9, 3) against the given rectangle using Cyrus-Beck line clipping algorithm.

Q3) Explain about parallel and perspective projections.

Q4) a) Explain the process of generating curves and surfaces using Bezier method.

   b) Derive 3 – D rotation matrices and transformations.

Q5) Classify the visible surface detection algorithms. Explain Z buffer algorithm for hidden surface removal.

<u>SECTION - B</u>   *(5 x 4 = 20)*

<u>Answer any FIVE Questions from the following</u>

Q6) Briefly explain about Beam penetration method.

Q7) What is shear transformation? Explain X-shear and Y-shear with example.

Q8) Explain Scanline polygon fill algorithm in detail.

Q9) Translate a triangle with vertices at original coordinates (10, 20), (10, 10), (20, 10) by t_x= 5, t_y=10, compute the resultant coordinate of the triangle.

Q10) Write about Flood fill algorithm for 8 - connected region.

Q11) Briefly explain parametric cubic curve and its applications.

Q12) Explain odd-even method of determining polygon inside points.

Q13) Write various steps for depth buffer algorithm.

Q14) Define Resolution.

Q15) Define text clipping.

Q16) What is B–spline curve?

Q17) What is the need of homogeneous coordinates?

Q18) What is window and view-port?

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M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

e - COMMERCE

Time : 3 Hours   **Maximum Marks : 70**

<u>**SECTION - A**</u>   *(3 x 15 = 45)*

<u>Answer any THREE of the following.</u>

Q1) Draw the architecture of E-commerce Model.

Q2) Explain the technologies required for E-commerce.

Q3) Discuss E-security measures with suitable examples.

Q4) Discuss different types E-payment Systems.

Q5) Explain the present status and future Prospectus of mobile commerce.

<u>**SECTION - B**</u>   *(5 x 4 = 20)*

<u>Answer any FIVE of the following.</u>

Q6) Features of E-commerce

Q7) Write the history of E-commerce.

Q8) Discuss the features of E-advertising.

Q9) Explain about smart cards.

Q10) Write the significance of E-CRM

Q11) Discuss about E-strategy.

Q12) Write the role of network routers in E-commerce.

Q13) Explain about HTML.

Answer ALL questions

Q14)   Internet.

Q15)   Intelligent web design.

Q16)   E-cash.

Q17)   What is Encryption?

Q18)   What is Privacy?

DMCA208

M.C.A. DEGREE EXAMINATION, JUNE/JULY - 2019

(Second Year)

PROBABILITY & STATISTICS

Time : 3 Hours   Maximum Marks : 70

SECTION - A

Answer any THREE questions.

(3X15 = 45)

Q1)   a)   A graduate student applies for a job in two firm's X and Y. The probability of his being selected in firm X is 0.7 and being rejected at Y is 0.5. The probability of at least one of his application being rejected is 0.6. What is probability that he will be selected in one of the firms?

   b)   Derive mean and variance of Poisson distribution.

Q2)   Let X be a continuous random variable with distribution :

$$f(x) = \begin{cases} k\,x^2 & \text{if } 0 \le x \le 1 \\ 0 & \text{elsewhere} \end{cases}$$

   i) Evaluate k.   ii) Find $P\left(\dfrac{1}{4} \le X \le \dfrac{3}{4}\right)$

   iii) $P\left(x \ge \dfrac{2}{3}\right)$.

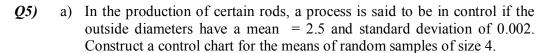**Q3)**   Let X be a continuous random variable having probability density function.

$$f(x) = \begin{cases} 2e^{-2x} & \text{for } x > 0 \\ 0 & \text{elsewhere} \end{cases}$$

   Find Moment Generating Function and Obtain E(X) and E(X²) by differentiating the Moment Generating Function.

Q4)   Set up an analysis of variance table for the following per acre production data for three varieties of wheat, each grown on 4 plots and state if the variety differences are significant.

Per Acre Production Data

Plot of Land	Variety of Wheat		
	A	B	C
1	6	5	5
2	7	5	4
3	3	3	3
4	8	7	4

Q5) a) In the production of certain rods, a process is said to be in control if the outside diameters have a mean = 2.5 and standard deviation of 0.002. Construct a control chart for the means of random samples of size 4.

b) A machine is set to deliver packets of a given weight. Ten samples of size 5 each were recorded. Below are given data.

Sample No : 1 2 3 4 5 6 7 8 9 10

Range   7 7 4 9 8 7 12 4 11 5

Draw the R-chart and comment on its state of control.

SECTION - B

Answer any Five questions from the following.*(5X4 = 20)*

Q6) State and prove addition theorem on probability.

Q7) The mean and variance of binomial distribution are 4 and 3 respectively. Find $(X \geq 1)$.

Q8) If a random variable X follows a normal distribution such that $P(9.6 \leq X \leq 13.8) = 0.7008$ and $P(X \geq 9.6) = 0.8159$. Find the mean and variance of the distribution.

Q9) Write about one-tailed and two-tailed tests.

Q10) Write the conditions of validity of χ^2 -test.

Q11) Fit a curve of the form $y = a\, b^x$ from the following data :

x :   2   3   4   5   6
y : 144   172.8   207.4   248.8   298.6

Q12) Describe the technique of ANOVA for one-way of classification.

Q13) What are the major parts of a Control Chart?

SECTION - C

Answer All Questions.   *(5X1 = 5)*

Q14) Define conditional probability.

Q15) Define generating function for Binomial distribution.

Q16) Define Null hypothesis.

Q17) What is the significance of ANOVA?

Q18) What is the product quality control?

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