

**(DMCA201)**

**M.C.A. DEGREE EXAMINATION, MAY – 2017**

**Second Year**

**SOFTWARE ENGINEERING**

**Time : 3 Hours**

**Maximum Marks : 70**

---

**Section - A**

**(3 x 15 = 45)**

**Answer any three of the following**

- Q1)** Explain about software process frame work in detail.
- Q2)** Explain how both waterfall model and prototyping model can be accommodated in the spiral process model.
- Q3)** Describe various prototyping techniques and discuss on analysis and modeling.
- Q4)** Describe decomposition levels of abstraction and modularity concepts in software design.
- Q5)** Discuss the difference between black box and white box testing models.

**Section - B**

**(5 x 4 = 20)**

**Answer any five of the following**

- Q6)** Briefly explain about various CMM levels.
- Q7)** Write the distinct steps in requirements engineering process?
- Q8)** Describe how software requirements are documented?
- Q9)** With an example explain about DFD.
- Q10)** What are the characteristics of a good design?

**Q11)** Describe about software failures and faults?

**Q12)** Describe unit testing and integration testing.

**Q13)** Write about metrics for source code.

**Section - C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Define validation and verification.

**Q15)** Define cohesion.

**Q16)** How do you evaluate user interface?

**Q17)** What is static and dynamic testing?

**Q18)** Define boundary analysis.



**(DMCA202)**

**MCA DEGREE EXAMINATION, MAY - 2017**  
**Second Year**  
**Programming with Java**

**Time : 3 Hours**

**Maximum Marks : 70**

---

**Section – A**

**Answer any three questions**

**[3 × 15 = 45]**

- Q1)** Discuss various object oriented programming concepts of Java.
- Q2)** What is inheritance? Discuss various forms of inheritance in Java.
- Q3)** Explain the purpose of following keywords with suitable example:
- |            |                        |
|------------|------------------------|
| i) Final   | ii) Garbage collection |
| iii) Super | iv) Static             |
- Q4)** What is an Interface? How it is created? Explain its use with suitable example.
- Q5)** What is Event Handling in java? List out the available event classes and listener interfaces with suitable example.

**Section – B**

**Answer any five questions of the following**

**[5 × 4 = 20]**

- Q6)** What is byte code? How does JVM help to implement the platform independence nature?
- Q7)** Describe various data types in java and mention its size.
- Q8)** Write about different access specifiers in java.
- Q9)** Explain about method over loading with example.

**Q10)** Differentiate between

- i) Buffered Reader and Buffered Writer.
- ii) Byte stream and character streams

**Q11)** What is an exception? Describe different types of user defined exception.

**Q12)** Describe applet life cycle with state diagram.

**Q13)** Briefly explain the following with syntax:

- i) Checkbox
- ii) Scrollbar

**Section – C**

**Answer all questions**

**[5 × 1 = 5]**

**Q14)** What is type casting?

**Q15)** What is wrapper class?

**Q16)** Define constructor

**Q17)** Define package

**Q18)** Define thread



**(DMCA203)**

**M.C.A. DEGREE EXAMINATION, MAY – 2017**

**Second Year**

**COMPUTER NETWORKING**

**Time : 3 Hours**

**Maximum Marks : 70**

---

**Section - A**

*(3 x 15 = 45)*

**Answer any three Questions**

- Q1)** Explain about various multiplexing techniques.
- Q2)** Explain about OSI network model.
- Q3)** Explain about IEEE802.3 and 802.2 Ethernet.
- Q4)** Explain about various routing schemes.
- Q5)** Explain about DES.

**Section - B**

*(5 x 4 = 20)*

**Answer any five questions**

- Q6)** Explain about analog signal and digital signals.
- Q7)** Explain about encoding schemes.
- Q8)** Explain about Token Ring.
- Q9)** Explain about ISDN.
- Q10)** Explain about Virtual LAN.
- Q11)** Explain about hierarchical addressing.

**Q12)** Explain about SNMP.

**Q13)** Explain about security threats.

**Section - C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Explain about amplitude modulation.

**Q15)** What is radio waves?

**Q16)** Explain about integrated switches and hubs.

**Q17)** Explain about HTML.

**Q18)** Explain about firewall.

**\* \* \***

(DMCA204)

M.C.A. DEGREE EXAMINATION, MAY - 2017

Second Year

Computer Algorithms

Time : 3 Hours

Maximum Marks : 70

---

**SECTION - A**

(3 × 15 = 45)

**Answer any three of the following**

- Q1)** Explain about asymptotic notations used to measure the running time of algorithm.
- Q2)** Write a sub routine for merge sort illustrate for data  $n = 10$  and also compute its complexity.  
15, 26, 19, 29, 14, 11, 6, 22, 5, 7.
- Q3)** What is optimal binary search tree? Construct an optimal binary search tree for the following items with probabilities given in the table below.

Items	1	2	3	4	5
Probability	0.24	0.22	0.23	0.3	0.01

- Q4)** Construct Huffman code for the following data  
 $P(A) = 0.1 = p(B)$ ,  $p(C) = 0.3$ ,  $p(D) = 0.14$ ,  $p(E) = 0.12$  and  $p(F) = 0.24$   
Encode the text CAD and Decode 10011011011101
- Q5)** Illustrate branch and bound technique with suitable example.

**SECTION - B**

(5 × 4 = 20)

**Answer any five of the following**

- Q6)** Represent the following functions in terms of Big O and Omega ( $\Omega$ ) notation:  
 $f(n) = 3n^{1.5} + (\sqrt{n})^3 + \log n$
- Q7)** Briefly explain about divide and conquer method.
- Q8)** Write about DFS based topological sorting problem with suitable example.

**Q9)** Solve the all-pair shortest path problems for given adjacent matrix graph using Floyd's Algorithm.

$$\begin{bmatrix} 0 & 4 & 8 & \infty \\ \infty & 0 & 5 & 12 \\ \infty & \infty & 0 & 7 \\ 5 & \infty & \infty & 0 \end{bmatrix}$$

**Q10)** State and explain about N – queen's problem.

**Q11)** Find the subset from the given sum using back tracking.  
 $S = \{1, 2, 5, 7\}$  and  $d = 8$ .

**Q12)** Write about Kruskal's algorithm to construct minimum spanning tree.

**Q13)** Find optimal solution for 0/1 knapsack problem  $(w_1, w_2, w_3, w_4) = (10, 15, 6, 9)$ ,  
 $(p_1, p_2, p_3, p_4) = (2, 5, 8, 1)$  and  $m = 30$ .

**SECTION - C**

***(5 × 1 = 5)***

**Answer all questions**

**Q14)** Prove that  $\sum_{k=0}^n k^3 = \Theta(n^4)$ .

**Q15)** State job sequencing problem.

**Q16)** What is meant by Hamilton Cycles?

**Q17)** Define backtracking.

**Q18)** Define connected and bi-connected components.





**(DMCA205)**

**M.C.A. DEGREE EXAMINATION, MAY – 2017**

**Second Year**

**DISTRIBUTED OPERATING SYSTEMS**

**Time : 3 Hours**

**Maximum Marks : 70**

---

**Section - A**

**(3 x 15 = 45)**

**Answer any three Questions**

- Q1)** Discuss various hardware and software concepts in distributed OS.
- Q2)** Explain ATM networks in detail.
- Q3)** Discuss the issues that have to be considered while allocating processes to processors in distributed systems.
- Q4)** Explain distributed algorithm for Deadlock detection and prevention.
- Q5)** Discuss different approaches to solve multi copy update problem, for file replication in the distributed file systems.

**Section - B**

**(5 x 4 = 20)**

**Answer any five questions from the following**

- Q6)** Explain Light weight RPC? Is it possible to implement light weight RPC in railway reservation system?
- Q7)** Write short notes on atomic transactions.
- Q8)** What is thread? Describe different types of threads.
- Q9)** Explain Distributed clock synchronization algorithm.
- Q10)** Explain desirable features of Process migration in Distributed Operating system.

**Q11)** Discuss the relative advantages and disadvantages of using full-file caching and block caching mechanism of a distributed file systems.

**Q12)** Write short notes fault tolerance.

**Q13)** Write about inter-process communication and co-ordination mechanisms.

**Section - C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** Give any two goals of DOS.

**Q15)** What is scheduling?

**Q16)** What is thrashing?

**Q17)** What is stateless file server?

**Q18)** Define mutual exclusion.

\* \* \*

(DMCA206)

M.C.A. DEGREE EXAMINATION, MAY - 2017

Second Year

COMPUTER GRAPHICS

Time : 3 Hours

Maximum Marks : 70

---

**SECTION - A**

(3 × 15 = 45)

**Answer any three questions**

- Q1)** Illustrate Bresenham's circle generation algorithm with suitable example.
- Q2)** Explain about Sutherland – Hodgman polygon clipping algorithm.
- Q3)** Discuss about parallel and perspective projections with its matrix representation.
- Q4)** What are the properties of B-splines? Compare B – splines with Bezier curves.
- Q5)** Explain about Z – buffer, Sub division algorithms with suitable example.

**SECTION - B**

(5 × 4 = 20)

**Answer any five questions**

- Q6)** Describe various ways to representing the images.
- Q7)** Explain about character generation algorithm with example.
- Q8)** Explain about antialiasing.
- Q9)** Derive the transformation matrix, when point P (x, y) is reflected about line  $y = mx + c$ .
- Q10)** Explain about window - to - viewport mapping.
- Q11)** Write short notes on 3-D clipping.
- Q12)** Describe the problem of interpolation.

**Q13)** Write a procedure to eliminate hidden lines.

**SECTION - C**  
**Answer all questions**

**(5 × 1 = 5)**

**Q14)** Give the applications of computer graphics.

**Q15)** Define region filling.

**Q16)** Define point clipping.

**Q17)** What is quadratic surface?

**Q18)** Define aspect ratio.



**(DMCA207)**

**M.C.A. DEGREE EXAMINATION, MAY – 2017**

**Second Year  
E-COMMERCE**

**Time : 3 Hours**

**Maximum Marks : 70**

---

**Section - A**

**(3 x 15 = 45)**

**Answer any three Questions**

- Q1)** Explain about e-business models based on the relationship of transaction types.
- Q2)** State and discuss e-marketing strategies with example.
- Q3)** Explain about digital token –based e – payment system and smart card cash payment system mechanisms and also their advantages and disadvantages.
- Q4)** Explain the role played by e – supply chain planning tools in managing supply chain of an e – business.
- Q5)** Discuss seven dimensions of e – commerce strategy.

**Section - B**

**(5 x 4 = 20)**

**Answer any five of the following**

- Q6)** Describe – commerce opportunities for industries.
- Q7)** Write about internet standards and specifications.
- Q8)** Describe different possible security incidents on the internet.
- Q9)** Write about digital payment requirements.
- Q10)** What role does cryptography play in e – commerce?

**Q11)** Briefly explain about e – CRM toolkit

**Q12)** Describe different e – supply components.

**Q13)** Write the applications of mobile commerce.

**Section - C**

**(5 x 1 = 5)**

**Answer all questions**

**Q14)** What is supplier centric B2B electronic commerce.

**Q15)** What is meant by electronic cheque?

**Q16)** What is e – marketing value chain?

**Q17)** Give the advantages of ERP.

**Q18)** What is mobile commerce?



(DMCA208)

M.C.A. DEGREE EXAMINATION, MAY - 2017

Second Year

PROBABILITY AND STATISTICS

Time : 3 Hours

Maximum Marks : 70

---

**SECTION - A**

(3 × 15 = 45)

Answer any THREE questions

- Q1)** Prove Baye's theorem and explain with suitable example.
- Q2)** Companies B1, B2, B3 produce 30%, 45%, 25% of the cars respectively. It is known that 2%, 3%, 2% of these cars produced from B1, B2, B3 are defective.
- a) What is the probability that a car purchased is defective.
  - b) If a car purchased is found to be defective what is the probability that this car is produced by the company B.
- Q3)** Take 30 slips of paper and label 5 each—4 and 4, four each – 3 and 3, three each 2 and 2 and each-1, 0 and 1, if each slip of the paper has the same probability of being drawn find the probabilities of getting –4, –3, –2, –1, 0, 1, 2, 3, 4 and find the mean and variance of this distribution of means.
- Q4)** The following data pertain to the number of computer jobs per day and the required CPU time required:
- |               |   |   |   |   |    |
|---------------|---|---|---|---|----|
| No. of jobs X | 1 | 2 | 3 | 4 | 5  |
| CPU time Y    | 2 | 5 | 4 | 9 | 10 |
- Fit a least square line to estimate the mean CPU time and using it estimate the CPU time at  $x = 3.5$
- Q5)** Measuring specimens of nylon yarn taken from two machines, it was found that 8 specimens from 1<sup>st</sup> machine had a mean denier of 9.67 with a standard deviation of 1.81 while 10 specimens from a 2<sup>nd</sup> machine had a mean denier of 7.43 with a standard deviation 1.48. Assuming the population are normal test the hypothesis  $H_0 : \mu_1 - \mu_2 = 1.5$  against  $H_1 : \mu_1 - \mu_2 > 1.5$  at 0.05 level of significance?

**SECTION - B**  
**Answer any FIVE questions**

(5 × 4 = 20)

- Q6)** Explain the Probability generation functions with example.
- Q7)** If the mean and S.D. of normal distribution are 70 and 16, find  $p(38) < x < 46$ .
- Q8)** Derive the formula to find the mean and variance of Binomial distribution.
- Q9)** Two digits are selected at random from the digits 1 through 9.
- If the sum is odd, what is the probability that 2 is one of the numbers selected.
  - If 2 is one of the digits selected, what is the probability that the sum is odd 10.  
What do you mean?
- Q10)** What is the probability that X will be between 75 and 78 if a random sample of size 100 taken from an infinite population has mean 76 and variance 256?
- Q11)** Two dice are thrown. Let X the random variable assign to each point (a, b) in S the maximum of its numbers. Find the distribution, the mean and variance of the distribution.
- Q12)** Fit a curve of the form  $y = ax^b$  by the method of least squares for the following data:
- |   |   |   |     |   |      |
|---|---|---|-----|---|------|
| X | 1 | 2 | 3   | 4 | 5    |
| Y | 5 | 2 | 4.5 | 8 | 12.5 |
- Q13)** The performance of a computer is observed over a period of 2 years to check the claim that the probability is 0.20 that its downtime will exceed 5 hours in any given week. Testing the null hypothesis  $P = 0.20$  against the alternate hypothesis  $P \neq 0.20$ , what can we conclude at the level of significance  $\alpha = 0.05$ , if there were only 11 weeks in which the downtime of the computer exceeded 5 hours?



**SECTION - C**  
**Answer ALL questions**

**(5 × 1 = 5)**

**Q14)** What is conditional probability.

**Q15)** What is the objective of Uniform exponential distribution.

**Q16)** Define a sampling.

**Q17)** What are the advantages Multiple regression?

**Q18)** What is Mean inter-arrival time?

