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Roll No.

BCA-IV Sem.

18018

B. C. A. Examination, May 2016

Software Engineering

(BCA-403)

(New)

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. $3 \times 5 = 15$

1. Define Software Engineering.

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2. What is Software Implementation ?
3. What is Software Maintenance ?
4. Explain design process.
5. Write about software change strategics.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries $7\frac{1}{2}$ marks. Short answer is required not exceeding 200 words. $7\frac{1}{2} \times 2 = 15$

6. What do you mean by configuration management ?
7. Explain the various software engineering activities.
8. Define perceptive software maintenance.

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Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. $15 \times 3 = 45$

9. Describe the procedural design technique in software design methodology.
10. Explain the various techniques for the software maintenance.
11. Explain the requirement engineering activities in detail.
12. Give the fundamental design applications related to software engineering.
13. Write some design principles for maintainability.

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B. C. A. Examination, May 2016

Operating System

(BCA-402)

(New)

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. $3 \times 5 = 15$

1. Name two differences between logical and physical addresses.

2. What is preemptive and non-preemptive scheduling? Explain.
3. Which are the four conditions that causes the occurrence of a deadlock? Explain.
4. What are the functions of device management?
5. Explain the concept of system, protection and security.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries $7\frac{1}{2}$ marks. Short answer is required not exceeding 200 words. $7\frac{1}{2} \times 2 = 15$

6. Describe the following allocation algorithms in the context of contiguous allocation :
 - (i) First fit
 - (ii) Best fit
 - (iii) Worst fit.

- 7. What is deadlock ? Discuss the method for handling deadlocks.
- 8. What is disk scheduling ? Define various types of disk scheduling.

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. 15×3=45

- 9. (a) What is an operating system ? Discuss the role of an operating system.
- (b) What is memory segmentation ? How is it different from paging ?
- 10. (a) Explain Semaphore.
- (b) Explain with examples of your own, the following any two process scheduling algorithm :
 - (i) First Come First Serve
 - (ii) Shortest Job First
 - (iii) Priority Scheduling
 - (iv) Round Robin.

- 11. (a) Define Resource Allocation Graph. Give that, there is only one instance of each resource type, describe the resource allocation graph algorithm for deadlock avoidance using a suitable example.
- (b) Discuss the procedure for avoiding a deadlock situation. Also describe the procedure to achieve safe state.
- 12. (a) Explain the different techniques to improve disk reliability.
- (b) Explain the different activities performed by disk management.
- 13. (a) Consider the following page reference string :
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 2, 1, 2, 3, 6
How many page fault would occur for the following replacement algorithms, assuming four frames ?
 - (i) LRU replacement
 - (ii) FIFO replacement
 - (iii) Optimal replacement.
- (b) Describe the following with suitable example :
 - (i) Directory structure
 - (ii) Free space management.

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B. C. A. Examination, May 2016

OPTIMIZATION TECHNIQUES

(BCA-404)

(New)

Time : Three Hours] [Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions of this Section. Each question carries 3 marks. Very short answer is required not exceeding 75 words. 3×5=15

1. Define a general and standard linear programming problem.

2. Solve the following LPP by graphical method :

Maximize : $z = 2x_1 + x_2$

Subject to : $3x_1 + 4x_2 \leq 6$

$6x_1 + x_2 \leq 3$

$x_1, x_2 \geq 0.$

3. Customers arrive at a booking office window, being manned by a single individual at a rate of 25 per hour. Time required to serve a customer has exponential distribution with a mean of 120 seconds. Find the mean waiting time of a customer in the queue.

4. Draw economic order quantity graph showing the relationship of inventory costs with order quantity and inventory level overtime.

5. Explain briefly replacement policies for items whose efficiency deteriorates with time.

Section-B

(Short Answer Questions)

Attempt any *two* questions from this Section. Each question carries 7½ marks. 7½×2=15

6. Find the sequence that minimizes total elapsed time to complete the following six jobs and also find the minimum time :

Jobs :	1	2	3	4	5	6
MachineI:	3	12	15	6	10	9
MachineII:	8	10	10	6	12	3

7. Solve the following assignment problem represented by the matrix :

	I	II	III	IV	V
A	6	5	8	11	16
B	1	13	16	1	10
C	16	11	8	8	8
D	9	14	12	10	16
E	10	13	11	8	16

8. Obtain the steady state equations for the model $\{(M/M/1):(\infty/FCFS)\}$ and also find the formula for mean and the variance of the queue length.

Section-C

(Detailed Answer Questions)

Attempt any *three* questions from this Section.

Each question carries 15 marks. $15 \times 3 = 45$

9. Determine an optimum basic feasible solution to the transportation problem given below :

	D ₁	D ₂	D ₃	D ₄	
O ₁	1	2	3	4	6
O ₂	4	3	2	0	8 Capacity
O ₃	0	2	2	1	10
	4	6	8	6	24 Demand

where O_i and D_j denote i th origin and j th destination respectively.

10. Use simplex method to solve the following LPP :

Maximize : $Z = 4x_1 + 10x_2$

Subject to : $2x_1 + x_2 \leq 50$

$2x_1 + 5x_2 \leq 100$

$2x_1 + 3x_2 \leq 90$

$x_1, x_2 \geq 0$

11. Obtain the dual problem of the following LPP :

Maximize : $f(x) = 2x_1 + 5x_2 + 6x_3$

Subject to : $5x_1 + 6x_2 - x_3 \leq 6$

$-2x_1 + x_2 + 4x_3 \leq 4$

$x_1 - 5x_2 + 3x_3 \leq 1$

$-3x_1 - 3x_2 + 7x_3 \leq 6$

$x_1, x_2, x_3 \geq 0$

Also verify that the dual of the dual problem is the primal problem.

12. Derive the Wilson EOQ formula. What are the practical limitations of EOQ formula? Also discuss the costs involved in an inventory problem.

13. Explain the following :

(i) Present worth factor (pwf)

(ii) Discount rate

(iii) Dual simplex method

(iv) Group replacement and individual replacement policy

(v) Tic-tac problem.

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B. C. A. Examination, May 2016

Computer Graphics and Multimedia Application

[BCA-401(New)]

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as per instructions.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. $3 \times 5 = 15$

1. What is Computer Graphics ? Explain the different applications of Computer Graphics in several fields.

(2)

2. What is the difference between Raster image and Vector image ?
3. What is Clipping ? Name the different types of clipping.
4. What is Bezier Curve ? Write the two characteristics of Bezier Curve.
5. What is Animation ? Name different types of animation.

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries $7\frac{1}{2}$ marks. Short answer is required not exceeding 200 words. $7\frac{1}{2} \times 2 = 15$

6. What is Transformation ? Explain the basic 2-D transformation with example.
7. For 10×10 frame buffer, interpret the Bresenham algorithm to find which pixels are turned on for the line segment (1, 2) and (7, 6).

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8. Explain the Sutherland-Hodgeman clipping algorithm for polygon clipping and also implement it by considering suitable example.

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. $15 \times 3 = 45$

9. What is Cathode Ray Tube (CRT) ? Explain the functioning of CRT with proper diagram.
10. Write the steps to rotate an object about an arbitrary point (h, k) . Explain each step with proper diagram.
11. What is Cubic Bezier Curve ? A cubic Bezier curve is defined over the control points $(1, 1)$, $(2, 3)$, $(4, 4)$ and $(6, 1)$. Calculate the parametric midpoints of this curve and show that its gradient dy/dx is $1/7$.

12. What is Multimedia ? Explain the different categories of multimedia. Also explain the different applications of multimedia.
13. Explain the different 3-D animation software. Also explain the different hardware required for computer animation.