A (Printed Pages 7)

(20622) Roll No. ....

BCA-IV Sem.

18019

B.C.A. Examination, June-2022

OPTIMIZATION TECHNIQUES

(BCA-404)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt **all** the sections as per instructions.

Section-A

(Very Short Answer Type Questions)

Note : Attempt **all** the **five** questions. Each question carries 3 marks.

1. Define optimal solution of a linear programming problem.
2. Define deterministic model in inventory theory.

P.T.O.

3. Define sequencing problem.
4. Explain queue length, waiting time and traffic intensity.
5. Explain group replacement and individual replacement.

Section-B

(Short Answer Type Questions)

Note : Attempt any **two** questions from this section. Each question carries 7½ marks.

6. Solve the following assignment problem:

		Man			
		1	2	3	4
	I	12	30	31	15
Job	II	18	33	9	31
	III	44	25	24	21
	IV	23	30	28	14

7. The cost of a machine is Rs. 6100 and its scrap value is only Rs. 100. The maintenance costs are found from experience to be as below:

Year	1	2	3	4	5	6	7	8
Maintenance Cost in Rs.	100	250	400	600	900	1250	1600	2000

When should the machine be replaced.

8. we have five jobs each of which must go through two machines A and B in the order AB. Processing times in hours are given in the table below:

Job	1	2	3	4	5
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine the sequence for the five jobs that will minimize the ellipse time.

Section-C

(Long Answer Type Questions)

Note : Attempt any **three** questions out of the following **five** questions. Each question carries 15 marks.

9. Solve the following LPP:

Max. $Z=5x_1+3x_2$

s.t. $3x_1+5x_2 \leq 15$

$5x_1+2x_2 \leq 10$

$x_1 > x_2 \geq 0$

10. Solve the following transportation problem:

		To 1	2	3	Supply
From	1	2	7	4	5
	2	3	3	1	8
	3	5	4	7	7
	4	1	6	2	14
Demand		7	9	16	34

11. We have five jobs, each of which must go through the machines A,B and c in the order ABC, Processing times are as follows :

	Processing times in hours		
Jobs	A	B	C
1	4	5	8
2	9	6	10
3	8	2	6
4	6	3	7
5	5	4	11

Determine a sequence for the five jobs that will minimize the elapsed time T.

12. The cost of a new machine is Rs. 5000. The maintenance cost of n^{th} year is given by $C_n = 500(n-1)$, $n=1,2,3,\text{-----}$. Suppose that the discount rate per year is 0.5. After how many years it will be economical to replace the machine?

13. Customers arrive at a sales counter manned by a single person according to a poissen process with a mean rate of 20 per hour. The time required to serve a customer has an exponential distribution

with a mean of 100 seconds. Find the average waiting time of a customer and queue length.

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(20622) Roll No. .....

BCA - IV Sem.

18016

B.C.A. Examination, June-2022

COMPUTER GRAPHICS AND MULTIMEDIA APPLICATION

[BCA-401]

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt all the Sections as per instructions.

Section-A

(Very Short Answer Type Questions)

Note : Attempt all the five questions. Each questions carries 3 marks. Very short answer is required not exceeding 75 words.

P.T.O.

1. What is the draw back of DDA line generation algorithm and advantage of Bresenham's line algorithm. 3
2. What is Computer Graphics? Indicate five practical applications of Computer Graphics. 3
3. What is viewing transformation? What is difference between window and view port? 3
4. What is digital video? Explain the use of digital video in developing multimedia applications. 3
5. What are the animation file formats? List the animation software's 3

Section-B

(Short Answer Types Questions)

Note : Attempt any two questions.

$2 \times 7\frac{1}{2} = 15$

6. It is desired to draw a line starting at A (3,6) and ending at B(6,2) on a graphics

monitor use generalized Bresenham's algorithm to determine the pixels that world be put ON. 7½

7. Show that this is same as coordination of matrix for 45 degree clockwise rotation followed by reflection about x axis and finally by counter clockwise rotations by 45 degree about origin. 7½

8. Explain Multimedia with suitable example. State the importance of animation in multimedia.

Section-C

(Detailed Answer Questions)

Note : Attempt any **three** questions:

3×15=45

9. Define popular video recording formats and discuss their strength and weakness for use in multimedia with its benefits and drawbacks of each type? 15

10. Explain MIDI versus Digital audio and also write the advantages and disadvantages of MIDI over digital audio. 15

11. Explain principles of animation and how we can perform animation by computer. 15

12. Write down and explain the midpoint circle drawing algorithm. Assume 10cm as the radius and co-ordinate origin as the center of the circle. 15

13. (i) Discuss on the various input techniques in detail. 15

(ii) Show a trans formation matrix for rotating an object about a specified pivot point.

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Roll No. ....

BCA - IV Sem.

18020

B.C.A. Examination, June-2022

MATHEMATICS-III

(BCA - 406)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt **all** the sections as per instructions.

नोट : **सभी** खण्डों को निर्देशानुसार हल कीजिए।

Section - A/ खण्ड - क

(Very Short Answer Type Questions)

(अति लघु उत्तरीय प्रश्न)

Note : Attempt all the **five** questions. Each question carries 3 marks.

नोट : सभी **पाँच** प्रश्नों के उत्तर दीजिए। प्रत्येक प्रश्न 3 अंकों के हैं।

1. Show that

दिखाइये कि

$$|z_1+z_2|^2 + |z_1-z_2|^2 = 2|z|^2 + 2|z_2|^2$$

P.T.O.

2. Define sequence with example.

अनुक्रम को उदाहरण सहित परिभाषित करो।

3. If $f(x, y, z) = 3x^2y - y^3z^2$, then find grad f at point (1, -2, -1).

यदि $f(x, y, z) = 3x^2y - y^3z^2$ तब ग्रेड f का मान बिन्दु (1, -2, -1) पर बताइये।

4. Solve

हल करो

$$\frac{dy}{dx} = \sin(x+y)$$

5. Solve

हल करो

$$(D^2+3D^2+3D+1)y = e^x + e^{-x}$$

Section - B / खण्ड - ख

(Short Answer Type Questions)

(लघु उत्तरीय प्रश्न)

Note : Attempt any **two** questions. Each question carries 7.5 marks.

नोट : किन्हीं **दो** प्रश्नों के उत्तर दीजिए। प्रत्येक प्रश्न 7.5 अंकों के हैं।

6. Determine the regions defined by

क्षेत्र का निर्धारण कीजिए, यदि

$$|z-1| + |z+1| \leqslant 4$$

7. Solve

हल करो

$$xdx + ydy + \frac{xdy - ydx}{x^2 + y^2} = 0$$

8. Show

दिखाइये

$$\nabla r^{-3} = -3r^{-5}\vec{r}, \text{ where } \vec{r} = xi + yj + z\hat{k}$$

Section - C / खण्ड - ग

(Detailed Answer Type Questions)

(विस्तृत उत्तरीय प्रश्न)

Note : Attempt any **three** questions. Each question carries 15 marks.

नोट : किन्हीं **तीन** प्रश्नों के उत्तर दीजिये। प्रत्येक प्रश्न 15 अंकों के हैं।

9. Show that

दिखाइये कि

$$\lim_{n\to\infty}\left(1 + \frac{1}{n}\right)^n = e, \text{ where } 2 < e < 3$$

10. Test the Convergence of following series

निम्न श्रेणी की अभिसारिता की जांच करो

$$\frac{1}{4} + \frac{9}{2^2.4^2}x + \frac{3^2.5^2}{2^2.4^2.6^2}x^2 + \frac{3^2.5^2.7^2}{2^2.4^2.6^2.8^2}x^3 + \ldots\ldots$$

11. Obtain the Fourier series of $f(x) = \left(\frac{\pi - x}{2}\right)$ in the interval $(0, 2\pi)$ and hence deduce

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \ldots\ldots$$

अन्तराल $(0, 2\pi)$ के लिए $f(x) = \left(\frac{\pi - x}{2}\right)$ को फोरियर श्रेणी में दिखाओ और दिखाओं कि

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \ldots\ldots$$

12. Solve

हल करो

$$(1+y^2)dx-(\tan^{-1}y-x)dy = 0$$

13. Solve

हल करो

$$(D^2+1)y = \sin x \sin 2x$$

A

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BCA - IV Sem. Roll No. ....

18017

B.C.A. Examination, June-2022

OPERATING SYSTEM

[BCA-402]

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt **all** the Sections as per instructions.

Section-A

(Very Short Answer Type Questions)

Note : Attempt all the **Five** questions. Each question carries **3** marks. Very short answer is required not exceeding 75 words. 3x5=15

1. Define different a file system.
2. What is purpose of system calls?

3. What is the Principle advantage of multiprogramming?
4. What is hard and soft semaphore?
5. How measure reliabilty for H/W disk?

Section-B

(Short Answer Types Questions)

Note : Attempt any **two** questions out of the following **three** questions. Each question carries **7½** marks. Short answer is required not exceeding 200 words. 2x7½=15

6. On a system using paging and segmentation, The virtual address space consists of up to 8 segments where each segment can be up to 229 bytes long. The hardware page each segment into 256 bytes pages. How many bits in the virtual address specify the:

(a) Segment number?

(b) Page number

(c) Offset within Page?

(d) Entire virtual address?

7. Discuss characteristics of device which effect on supervisor call interface?

8. What methods determines how a file's records are allocated into blocks?

Section-C

(Detailed Answer Questions)

Note : Attempt any **Three** questions out of the following **five** questions. Each questions carries **15** marks. Answer is required in detail. 3x15=45

9. Define multiprocessor system. What are difference between symmetric and asymmetric multiprocessing? Explain, advantages and disadvantage of multiprocessor systemes?

10. Write short notes on following:

(a) Deadlock Prevention

(b) Disk Swap-space management

(c) Real time System

(d) Page Replacement

11. (a) What Computer Bus? Different list different type of Bus.

(b) What is architecture of Peripheral Component Interconnect Bus?

12. What is demand paging? How page fault occures? What are factors that affect the determination of the page size?

13. What is Thread? Discuss different approaches for implementation of Process Threads.

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(20622) Roll No.

BCA-IV SEM

18018

B.C.A. Examination, June-2022

SOFTWARE ENGINEERING

(BCA-403)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt **all** the sections as per instructions.

Section-A

(Very Short Answer Type Questions)

Note:- Attempt all the **five** questions. Each questions carries 3 marks. Very short answer is required no exceeding 75 words.

1. What is feasibility study? What are the contents we should contain in the feasibility report? 3

2. Differentiate between verification and validation. 3
3. Explain Agile methodology in short. 3
4. Is it possible to estimate software size before coding? Justify your answer with suitable example. 3
5. Compare Development Testing with Regression Testing. 3

Section-B

(Short Answer Type Questions)

Note:- Attempt any **two** questions out of following three questions. Short answer not exceeding 200 words is required. Each questions carries 7½marks.

6. How does "Project Risk" factor affect the spiral model of software development? 7½

7. What is the difference between SRS document and design document? What are the contents of both the documents? 7½

8. What are the characteristics to be considered for the selection of life cycle model? Explain clearly. 7½

Section-C

(Long answer Type Questions)

Note:- Attempt any **three** questions out of following **five** questions. Each questions carries 15 marks. A detailed answer is required.

9. Define module coupling and explain different types of coupling in detail. 15

10. Describe in detail the complete Software maintenance process. 15

11. Explain all levels of COCOMO model. Assume that the size of an organic software product has been estimated to be 32,000 lines of code. Determine the effort required to develop the software product and the nominal development time. 15

12. Describe 'Rapid Application Development' (RAD) model in detail. 15

13. (i) What are the limitations of waterfall model? 7½

(ii) How some of the limitations of waterfall model are overcome by iterative methods? 7½