

Total Pages : 9

B.Sc./5th Sem (H)/Comp/22 (CBCS)

2022

5th Semester Examination
COMPUTER SCIENCE (Honours)

Paper : DSE 1-T

[CBCS]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

[Information Security]

1. Answer any *five* questions : 2×5=10

- (a) What are the types of security attacks ?
- (b) What is digital certificate ?
- (c) Compare block ciphers with stream ciphers.
- (d) Compare substitution ciphers with transposition ciphers.
- (e) What do you mean by risk analysis in security ?
- (f) What is Salami attack ?
- (g) What is a computer virus ?
- (h) What are the limitations of firewalls ?

P.T.O.

2. Answer any **four** questions :

5×4=20

- (a) Briefly discuss about the need for information security.
- (b) Write about strength of DES algorithm.
- (c) What are the different types of firewalls ? Describe.
- (d) Compare and Contrast between Symmetric and Asymmetric key cryptography.
- (e) Briefly explain the concept of memory and address protection in OS.
- (f) Discuss about multilevel security in database system.

3. Answer any **one** question :

10×1=10

- (a) Explain the Digital Signature Algorithm (DSA) with appropriate diagram.
 - (b) Discuss about Secure Hash algorithm.
-

(3)

OR

[Microprocessor-8085]

Group - A

1. Answer any *five* questions : $2 \times 5 = 10$

- (a) Compare assembly and high-level language.
- (b) Explain the function of parity flag.
- (c) How much time is required to execute an instruction of 10 T-states? (Clock frequency 5 MHz)
- (d) Why data bus is bidirectional in microprocessor?

(e) What are the functions of status register and

(f) What are the functions of program counter and

(g) What are the functions of

Q. What is the function of

(4)

(c) What is fold back memory? Explain with example.

2+3

(d) Write a short note about DMA controller.

(e) What is subroutine? Which instructions are used in 8085 microprocessor to implement subroutine ?

2+3

(f) Write a program in 8085 assembly language to add two arrays.

Group - C

3. Answer any *one* question :

10×1=10

(a) (i) Write a program for ASCII to binary conversion.

(ii) Explain PUSH and POP instructions of 8085 microprocessor.

6+4

(b) What is an interrupt in 8085? Briefly describe different types of interrupts in 8085.

2+8

(5)

OR

[Operational Research]

Group - A

1. Answer any *five* questions : 2×5=10

- (a) Define Basic feasible solution.
- (b) What do you mean by extreme point ?
- (c) Define Convex Set with an example.
- (d) Write down Fundamental Quality theorem.
- (e) Give an example of artificial variable in a L.P.P.
- (f) Why Big M method or two phase methods are required in a L.P.P. ?
- (g) What do you mean by unbounded solution ?
- (h) What is slack variable ?

Group - B

2. Answer any *four* questions : 5×4=20

- (a) A firm manufactures two type of products A and B and sells them at a profit of Rs. 2 on type A and Rs. 3 on type B. Each product is processed on two machines G and H. Type A requires one minute of processing time on G and two minutes on H; type B requires one minute on G and one minute on H. The machine G is available for not

P.T.O.

(5)

OR

[Operational Research]

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P.T.O.

(5)

OR

[Operational Research]

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P.T.O.

(5)

OR

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Group - B

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- (a) A firm manufactures two type of products A and B and sells them at a profit of Rs. 2 on type A and Rs. 3 on type B. Each product is processed on two machines G and H. Type A requires one minute of processing time on G and two minutes on H; type B requires one minute on G and one minute on H. The machine G is available for not

P.T.O.

(6)

more than 6 hours 40 minutes while machine H is available for 10 hours during any working day.

Formulate the problem as a linear programming problem. To get maximum profit satisfying the constraints

(b) Solve the L.P.P. graphically

Minimize $Z = 3x + 5y$

Subject to, $2x + 3y \geq 12$

$$-x + y \leq 3$$

$$x \leq 4$$

$$\text{and } y \geq 3$$

$$x, y \geq 0$$

(non negativity constraint)

(c) Solve the L.P.P. by Simplex method

Maximize $Z = x_1 + x_2 + 3x_3$

Subject to, $3x_1 + 2x_2 + x_3 \leq 3$

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

$$x_1, x_2, x_3 \geq 0$$

(d) Construct the dual of the following L.P.P.

Maximize $Z = 3x_1 + 4x_2$

Subject to, $x_1 + x_2 \leq 12$

$$2x_1 + 3x_2 \leq 21$$

$$x_1 \leq 8$$

$$x_2 \leq 6$$

$$x_1, x_2 \geq 0$$

(7)

- (e) Find the extreme points of the Convex Set of the feasible solutions of the L.P.P. and find the maximum value

$$\text{Maximize } Z = 4x_1 + 7x_2$$

$$\text{Subject to, } 2x_1 + 5x_2 \leq 40$$

$$x_1 + x_2 \leq 11$$

$$x_1, x_2 \geq 0$$

- (f) Find all the basic feasible solution of the following equations :

$$x_1 + x_2 + 2x_3 = 9$$

$$3x_1 + 2x_2 + 5x_3 = 22$$

Group - C

3. Answer any *one* question :

10×1=10

- (a) Solve the following L.P.P. by penalty method

$$\text{Maximize } Z = 2x_1 + x_2 + 3x_3$$

$$\text{Subject to, } x_1 - 2x_2 + 3x_3 = 2$$

$$3x_1 + 2x_2 + 4x_3 = 1$$

$$x_1, x_2, x_3 \geq 0$$

- (b) Use two-phase method to solve the L.P.P.

$$\text{Maximize } Z = 3x_1 - x_2$$

$$\text{Subject to, } 2x_1 + x_2 \geq 2$$

$$x_1 + 3x_2 \leq 2$$

$$x_1 \leq 4$$

$$x_1, x_2 \geq 0$$

P.T.O.

(8)

OR

[Cloud Computing]

Group - A

1. Answer any *five* questions : 2×5=10

- (a) What is cloud computing ?
- (b) What are the benefits of cloud computing ?
- (c) What is the vision of cloud computing?
- (d) What is the platform as a service ?
- (e) What is private cloud ?
- (f) What is hybrid cloud ?
- (g) What are the security benefits of cloud computing ?
- (h) What is the difference between cloud and traditional data centers ?

Group - B

2. Answer any *four* questions : 5×4=20

- (a) Discuss information security in cloud computing.
- (b) Explain storage management techniques in cloud.
- (c) Explain the concept of cloud reference architecture.
- (d) Explain various applications of cloud computing.

(9)

(e) Briefly explain cloud characteristics.

(f) Briefly explain IaaS of cloud ?

Group - C

3. Answer any *one* question : 10×1=10

(a) Explain cloud deployment model. Briefly discuss about cloud stack. 5+5=10

(b) Discuss server virtualization in cloud computing. Explain the benefits of virtualization. 6+4=10
