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R-20

Code: 20A55FT

III B.Tech. I Semester Supplementary Examinations June 2024

Data Structures using Python

(Common to CE &ME)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | | | |
|---|----|----|--|
| 1. Answer all the following short answer questions (5 X 2 = 10M) | CO | BL | |
| a) List python sequence types | 1 | L1 | |
| b) Define Queue data structure | 2 | L2 | |
| c) Write recursive function for Fibonacci series | 3 | L1 | |
| d) Write the differences between binary tree and binary search tree | 4 | L1 | |
| e) Give, applications for pattern matching | 5 | L2 | |

PART-B

Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks)

- | | Marks | CO | BL |
|---|-------|----|----|
| UNIT-I | | | |
| 2. Explain static and dynamic arrays in python | 12M | 1 | L2 |
| OR | | | |
| 3. What is a Data structures? Explain Linear data structures and Non Linear data types with example | 12M | 1 | L3 |
| UNIT-II | | | |
| 4. a) Write an algorithm to convert infix to post fix expression using stack | 6M | 2 | L1 |
| b) Use stack to Convert the infix to postfix for a-(b+c)*(d/e) | 6M | 2 | L2 |
| OR | | | |
| 5. a) What is a linked list? Explain Single linked list and various operations on it. | 6M | 2 | L3 |
| b) Write a program to implement insert front and delete end operations. | 6M | 2 | L1 |
| UNIT-III | | | |
| 6. Explain the concept of towers of Hanoi | 12M | 3 | L2 |
| OR | | | |
| 7. Explain Merge sort? Sort the following elements using merge sort. Below is example for Your reference 45, 23, 20, 50,70, 24, 33, 43, 47. | 12M | 3 | L2 |
| UNIT-IV | | | |
| 8. a) What is Binary search? Write a Program to implement it? | 6M | 4 | L3 |
| b) What are the applications of binary search? | 6M | 4 | L3 |
| OR | | | |
| 9. Explain three standard ways of traversing a binary tree T with a recursive algorithm. | 12M | 4 | L2 |
| UNIT-V | | | |
| 10. Which pattern matching algorithm avoids the repeated comparison of characters? Discuss with suitable example. | 12M | 5 | L1 |
| OR | | | |
| 11. Which pattern matching algorithm scans the characters from right to left? Explain it with suitable example. | 12M | 5 | L1 |

*** End ***

Hall Ticket Number :									
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R-20

Code: 20A35CT

III B.Tech. I Semester Supplementary Examinations June 2024

Industrial Management
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | | | |
|---|-----------------|----|----|
| 1) Answer all the following short answer questions | (5 X 2 = 10M) | CO | BL |
| a) Explain the Concept of Management. | | 1 | L2 |
| b) Discuss any four factors influencing Plant Layout. | | 2 | L2 |
| c) Define Marketing. | | 3 | L1 |
| d) Describe Project Crashing. | | 4 | L3 |
| e) Distinguish between Personnel Management and HRM. | | 5 | L5 |

PART-B

Answer **five** questions by choosing one question from each unit (5 x 12 = 60 Marks)

- | | Marks | CO | BL |
|---|-------|----|----|
| UNIT-I | | | |
| 2. a) Explain the Functions of Management. | 6M | 1 | L2 |
| b) Discuss F.W Taylor's Scientific Management Theory. | 6M | 1 | L3 |

OR

- | | | | |
|---|-----|---|----|
| 3. Discuss the process of Organizing. Explain the Principles to be followed while creating an Organization Structure. | 12M | 1 | L2 |
|---|-----|---|----|

UNIT-II

- | | | | |
|---|----|---|----|
| 4. a) Discuss the factors which dictate the choice of Plant Location. | 6M | 2 | L3 |
| b) Distinguish between Product Layout and Process Layout. | 6M | 2 | L2 |

OR

- | | | | |
|---|-----|---|----|
| 5. Derive an equation for EOQ and solve the following problem. XYZ Company buys its annual requirement of 36,000 units in 6 installments. Each unit cost Rs1/- and the Ordering Cost is Rs 25/- per order. The inventory carrying cost is estimated as 20% of unit cost per annum. Find the total Annual cost of the existing inventory policy. How much money can be saved by EOQ? | 12M | 2 | L5 |
|---|-----|---|----|

UNIT-III

6. What are the different types of Charts and Diagrams used in Work Study Investigations? Explain. 12M 3 L5

OR

7. a) Explain various Functions of Marketing in detail. 6M 3 L2
b) Outline various types of Channels of Distribution. 6M 3 L4

UNIT-IV

8. a) Explain various Norms for drawing Network Diagram. 8M 4 L1
b) List out the Applications of PERT and CPM. 4M 4 L2

OR

9. A small engineering project is composed of seven activities as given below:

S.No	Activity	Optimistic Time(t_o) days	Most Likely Time(t_m) days	Pessimistic time(t_p) days
1	1-2	1	1	7
2	1-3	1	4	7
3	1-4	2	2	8
4	2-5	2	2	2
5	3-5	2	5	14
6	4-6	2	5	8
7	5-6	3	6	15

- a) Draw the Network Diagram for the given Project
b) Identify the Critical Path.
c) Find the Total Project Duration
d) Find the Slack at each Event

12M 4 L5

UNIT-V

10. a) Discuss the functions of Human Resource of Management. 6M 5 L2
b) Define Job Evaluation. Explain various methods of Job Evaluation. 6M 5 L2

OR

11. What do you understand by SWOT Analysis? Discuss how it can be carried out for Universities in general and a technological University in particular? 12M 5 L3

*** End ***

Hall Ticket Number :

R-20

Code: 20A352T

III B.Tech. I Semester Supplementary Examinations June 2024

Machining Processes
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | CO | BL |
|---|----|----|
| 1. Answer all the following short answer questions (5 X 2 = 10M) | | |
| a) Draw the nomenclature of cutting tool geometry or cutting tool signature | 1 | L2 |
| b) Explain the any one of the operation on lath | 2 | L1 |
| c) What are the main parts of shaper? | 3 | L2 |
| d) Define lapping | 4 | L1 |
| e) Define clamping. | 5 | L2 |

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT-I

- | | | | |
|---|-----|---|----|
| 1. Draw a Merchants circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting. | 12M | 1 | L3 |
|---|-----|---|----|

OR

- | | | | |
|--|-----|---|----|
| 2. List various types of chip breakers and explore their significance. | 12M | 1 | L2 |
|--|-----|---|----|

UNIT-II

- | | | | |
|---|-----|---|----|
| 3. With a neat sketch mark and describe the parts of the engine lathe, briefly. | 12M | 2 | L4 |
|---|-----|---|----|

OR

- | | | | |
|---|----|---|----|
| 4. a) Describe turning process of Lathes | 6M | 2 | L2 |
| b) Sketch and explain single spindle automate lathe | 6M | 2 | L2 |

UNIT-III

- | | | | |
|---|----|---|----|
| 5. a) Explain the working of radial drilling machine with a neat sketch | 6M | 3 | L2 |
| b) Show and describe various machining applications of slotting machine | 6M | 3 | L2 |

OR

6 Sketch and explain hydraulic drive of a horizontal shaper. 12M 3 L2

UNIT-IV

7. a) Explain Centreless grinding with a neat sketch 6M 4 L2

b) Explain various types of surface finishing processes 6M 4 L2

OR

8. What is broaching? What are its advantages? What are the principle types of broaching machines? 12M 4 L1

UNIT-V

9. Describe how the designs for jigs and fixtures are planned? 12M 5 L2

OR

10. Explain about how work pieces are located? 12M 5 L2

*** End ***

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R-20

Code: 20A351T

III B.Tech. I Semester Supplementary Examinations June 2024

Applied Thermodynamics

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. Answer *all* the following short answer questions (5 X 2 = 10M)
- | | | |
|--|-----|----|
| | CO | BL |
| a) What is the difference between fire tube and water tube boilers? | CO1 | L1 |
| b) What is the significance of critical pressure ratio of a steam nozzle? | CO2 | L2 |
| c) Differentiate impulse and reaction turbines. | CO3 | L1 |
| d) What are the advantages of closed-cycle over open-cycle gas turbine plant? | CO4 | L1 |
| e) Write two differences between vapour compression and vapour absorption refrigeration systems. | CO5 | L1 |

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT-I

2. a) Draw a neat schematic layout of Rankine cycle and derive an expression for its thermal efficiency. 6M CO1 L2
- b) Explain with a neat sketch the working principle of any one fire tube boiler. 6M CO1 L2

OR

3. In a Rankine cycle, the steam at inlet to turbine is saturated at a pressure of 30 bar and the exhaust pressure is 0.25 bar. Draw the T-S diagram and determine (i) the pump work, (ii) the turbine work, (iii) the Rankine efficiency, (iv) the condenser heat flow and (v) the dryness at the end of expansion. Assume a steam flow rate of 10 kg/s. 12M CO1 L4

UNIT-II

4. Derive expressions for critical pressure ratio and maximum discharge of a steam nozzle. 12M CO2 L2

OR

5. a) Explain the operation of counter flow type jet condenser with a schematic. 6M CO2 L2
- b) What are the sources and effects of air leakage in a steam condenser? 6M CO2 L2

UNIT-III

6. Steam enters the blade row of an impulse turbine with a velocity of 600 m/s at an angle of 25° to the plane of rotation of the blades. The mean blade speed is 255 m/s. The blade angle on the exit side is 30° . The blade friction coefficient is 10%. Determine (i) the angle of the blade on the entry side, (ii) the work done per kg of steam, (iii) the diagram efficiency and (iv) axial thrust per kg of steam/second.

12M CO3 L4

OR

7. In a 50 percent reaction turbine stage running at 3000 rpm, the exit angles are 30° and inlet angles are 50° . The mean diameter is 1 m. The steam flow rate is 10,000 kg/min and the stage efficiency is 85%. Determine (i) the power output of the stage, (ii) the specific enthalpy drop in the stage, (iii) the % increase in the relative velocity of steam when it flows over the moving blades.

12M CO3 L4

UNIT-IV

8. Derive an expression for optimum pressure ratio of constant pressure closed cycle gas turbine for maximum specific work output. Draw the thermodynamic cycle on both p-v and T-S planes.

12M CO4 L2

OR

9. An open cycle gas turbine plant works between the pressure range of 1 bar and 6 bar and temperature range of 300 K and 1023 K. The CV of the fuel used is 4200 kJ/kg. Find (i) air-fuel ratio, (ii) thermal efficiency of the plant and (iii) kW generating capacity of the plant if the flow of air is 10 kg/s. Assume the compression and expansion are isentropic and pressure losses are neglected. Draw the T-S diagram representing cycle of operation.

12M CO4 L3

UNIT-V

10. Explain in detail the working of vapour compression refrigeration system with a neat diagram. Show its thermodynamic cycle on T-S and p-H planes.

12M CO5 L2

OR

11. The sling psychrometer reads 40°C DBT and 28°C WBT. Calculate: (i) specific humidity (ii) relative humidity (iii) vapour density in air (iv) dew point temperature (v) enthalpy of the mixture per kg of dry air. Assume the atmospheric pressure to be 1.03 bar. Also define these properties.

12M CO5 L3

*** End ***