RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES
2021-2022
Department of Computer science and Engineering
21CSE01-Computational Complexity

MARK SHEET

Sl. No	Register Number	Student Name	MARKS
1	18TB1203	DEVA.R	92
2	18TB1205	DINESH.T	92
3	18TD1401	ADARSH.S	96
4	18TD1402	ANITHA.I	96
5	18TD1403	ANITHA.R	92
6	18TD1404	ARTHI.K	92
7	18TD1405	DEEPA.S	96
8	18TD1406	FAVAZ AHAMED M	96
9	18TD1407	GNANADISHALI.P	92
10	18TD1408	GOPINATH.N	92
11	18TD1409	GUNA PRIYA.M	96
12	18TD1410	IMMANUEL PAUL.S	96
13	18TD1411	KEERTHIGA.K	92
14	18TD1412	KOWSALYA.M	92
15	18TD1413	MADHAVA KUMARAN.P	92

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

16	18TD1414	MADHU BALA.R	96
17	18TD1415	MANIKANDAN.P	96
18	18TD1416	MEHARIN BEGAM.M	92
19	18TD1417	PAVITHRA.K	92
20	18TD1418	PREETHA.R	96
21	18TD1419	PREMKUMAR M	96
22	18TD1420	PRIYADHARSHINI.P	92
23	18TD1421	PUSHPA.R	92
24	18TD1422	RIFATH ALMAS.S	96
25	18TD1423	SANDHIYA.E	96
26	18TD1424	SENBAGAM.B	92
27	18TD1425	SHANTHINI.A	92
28	18TD1426	SIVASAKTHI.C	92
29	18TD1427	SOORIYA MOORTHY.G.B.	96
30	18TD1428	SUGANYA.P	96
31	18TD1429	SUGUMARAN.M	92
32	18TD1430	SUMITHRA S	92
33	18TD1431	SUNITHA.C	96
34	18TD1432	VIJAY.V	96

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.,
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road.
Sulthanpet P
Puducherry - 6

35	18TD1433	VINODHINI.M	92
36	18TH1007	KAVIYA.K	92
37	18TH1011	MONISHA.M	96

HOD

PRINCIPAL

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK
COLLEGE OF ENGINEERING AND TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES

2021-2022

Department of Computer science and Engineering
21CSE01-Computational Complexity

NAME:

CLASS:

DATE:

1. What does P stand for in computational complexity theory?
   a) Polynomial time
   b) Parallel time
   c) Probabilistic time
   d) Primitive time

   Answer: a) Polynomial time

2. Which class represents problems that can be solved in polynomial time by a non-deterministic Turing machine?
   a) P
   b) NP
   c) NP-hard
   d) NP-complete

   Answer: b) NP

3. What is the main difference between P and NP problems?
   a) P problems are solvable in polynomial time, NP problems are verifiable in polynomial time
   b) P problems are verifiable in polynomial time, NP problems are solvable in polynomial time
   c) P problems are unsolvable, NP problems are solvable
   d) P problems are exponential, NP problems are polynomial

   Answer: a) P problems are solvable in polynomial time, NP problems are verifiable in polynomial time

RAAK College of Engineering & Technology

Dr. S. SELVAVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

4. Which of the following is an NP-complete problem?
   a) Sorting a list
   b) Finding the shortest path in a graph
   c) The Traveling Salesman Problem
   d) Multiplying two numbers

   Answer: c) The Traveling Salesman Problem

5. What does it mean if a problem is NP-hard?
   a) It is at least as hard as the hardest problems in NP
   b) It can be solved in polynomial time
   c) It cannot be verified in polynomial time
   d) It is easier than NP problems

   Answer: a) It is at least as hard as the hardest problems in NP

6. Which complexity class contains problems that can be solved in polynomial space?
   a) P
   b) NP
   c) PSPACE
   d) EXP

   Answer: c) PSPACE

7. What is the significance of the P vs NP problem?
   a) It questions whether every problem whose solution can be verified quickly can also be solved quickly
   b) It determines if all polynomial problems can be solved in exponential time
   c) It relates to the halting problem
   d) It deals with parallel processing capabilities

   Answer: a) It questions whether every problem whose solution can be verified quickly can also be solved quickly.

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

8. What does it mean for a problem to be in class EXP?
   a) It can be solved in exponential time
   b) It can be solved in polynomial time
   c) It can be solved in logarithmic time
   d) It can be solved in constant time

   Answer: a) It can be solved in exponential time

9. Which of the following is a common method to show a problem is NP-complete?
   a) Reduction from an NP problem
   b) Reduction from an NP-hard problem
   c) Reduction from a P problem
   d) Reduction from a PSPACE problem

   Answer: b) Reduction from an NP-hard problem

10. Which of the following is true for an NP-complete problem?
    a) It is in NP and all problems in NP can be reduced to it
    b) It is in P and all problems in NP can be reduced to it
    c) It is not in NP but all problems in NP can be reduced to it
    d) It is neither in P nor in NP

    Answer: a) It is in NP and all problems in NP can be reduced to it

11. What does the class co-NP consist of?
    a) Problems whose complements are in NP
    b) Problems that are both in P and NP
    c) Problems that are neither in P nor NP
    d) Problems that can be solved in constant time

    Answer: a) Problems whose complements are in NP

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

12. What is the time complexity of the Bubble Sort algorithm?
    a) O(nlog n)O(n \log n)O(nlogn)
    b) O(n)O(n)O(n)
    c) O(n2)O(n^2)O(n2)
    d) O(2n)O(2^n)O(2n)

    Answer: c) O(n2)O(n^2)O(n2)

13. Which algorithm has a time complexity of O(nlog n)O(n \log n)O(nlogn)?
    a) Insertion Sort
    b) Merge Sort
    c) Bubble Sort
    d) Selection Sort

    Answer: b) Merge Sort

14. What is the space complexity of Depth-First Search (DFS) in a graph with VVV vertices?
    a) O(V+E)O(V + E)O(V+E)
    b) O(V)O(V)O(V)
    c) O(E)O(E)O(E)
    d) O(V2)O(V^2)O(V2)

    Answer: b) O(V)O(V)O(V)

15. What is the worst-case time complexity of Quick Sort?
    a) O(nlog n)O(n \log n)O(nlogn)
    b) O(n)O(n)O(n)
    c) O(n2)O(n^2)O(n2)
    d) O(2n)O(2^n)O(2n)

    Answer: c) O(n2)O(n^2)O(n2)

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

16. Which complexity class represents problems solvable in exponential space?

a) P

b) NP

c) PSPACE

d) EXPSPACE

Answer: d) EXPSPACE

17. Which of the following problems is known to be undecidable?

a) Sorting a list

b) Multiplying two numbers

c) The Halting Problem

d) Finding the shortest path in a graph

Answer: c) The Halting Problem

18. What does the term "polynomial-time reduction" mean?

a) Transforming one problem into another in polynomial time

b) Reducing the size of a dataset in polynomial time

c) Solving a problem in polynomial time

d) None of the above

Answer: a) Transforming one problem into another in polynomial time

19. What is the Big-O notation used for?

a) To describe the worst-case complexity of an algorithm

b) To describe the best-case complexity of an algorithm

c) To describe the average-case complexity of an algorithm

d) To describe the exact running time of an algorithm

Answer: a) To describe the worst-case complexity of an algorithm

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.,
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

20. Which complexity class represents problems that are solvable in non-deterministic polynomial time and verifiable in polynomial time?

a) P

b) NP

c) NP-complete

d) NP-hard

Answer: b) NP

21. What is the purpose of the Cook-Levin theorem?

a) To show that SAT is NP-complete

b) To prove P ≠ NP

c) To establish the concept of polynomial time

d) To demonstrate the equivalence of different models of computation

Answer: a) To show that SAT is NP-complete

22. What does it mean for a problem to be in class BPP (Bounded-error Probabilistic Polynomial time)?

a) It can be solved by a probabilistic Turing machine in polynomial time with error probability less than 1/3

b) It can be solved by a deterministic Turing machine in polynomial time

c) It can be solved by a probabilistic Turing machine in exponential time

d) It can be solved by a non-deterministic Turing machine in polynomial time

Answer: a) It can be solved by a probabilistic Turing machine in polynomial time with error probability less than 1/3

23. What is the time complexity of the Fast Fourier Transform (FFT)?

a) O(n2)O(n^2)O(n2)

b) O(nlog n)O(n \log n)O(nlogn)

c) O(nlog n2)O(n \log n^2)O(nlogn2)

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.,
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

d) O(n)O(n)O(n)

Answer: b) O(nlog n)O(n \log n)O(nlogn)

24. Which of the following is a common characteristic of NP-complete problems?

- a) They are all in NP
- b) Any NP problem can be reduced to them in polynomial time
- c) They are the hardest problems in NP
- d) All of the above

Answer: d) All of the above

25. What does it mean if P = NP?

a) Every problem that can be verified in polynomial time can also be solved in polynomial time

b) Every problem that can be solved in polynomial time can also be verified in polynomial time

c) Polynomial time problems cannot be solved

d) Non-deterministic polynomial time problems cannot be verified

Answer: a) Every problem that can be verified in polynomial time can also be solved in polynomial time

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES

2021-2022

Department of Computer science Engineering
21CSE01-Computational Complexity

NAME: DEVA.R
CLASS: IV / CSE
DATE: 20/08/2021

1. What does P stand for in computational complexity theory?
   a) Polynomial time
   b) Parallel time
   c) Probabilistic time
   d) Primitive time

23/25 92%

2. Which class represents problems that can be solved in polynomial time by a non-deterministic Turing machine?
   a) P
   b) NP
   c) NP-hard
   d) NP-complete

3. What is the main difference between P and NP problems?
   a) P problems are solvable in polynomial time, NP problems are verifiable in polynomial time
   b) P problems are verifiable in polynomial time, NP problems are solvable in polynomial time
   c) P problems are unsolvable, NP problems are solvable
   d) P problems are exponential, NP problems are polynomial

4. Which of the following is an NP-complete problem?
   a) Sorting a list
   b) Finding the shortest path in a graph

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

c) The Traveling Salesman Problem

d) Multiplying two numbers

5. What does it mean if a problem is NP-hard?

a) It is at least as hard as the hardest problems in NP

b) It can be solved in polynomial time

c) It cannot be verified in polynomial time

d) It is easier than NP problems

6. Which complexity class contains problems that can be solved in polynomial space?

a) P

b) NP

c) PSPACE

d) EXP

7. What is the significance of the P vs NP problem?

a) It questions whether every problem whose solution can be verified quickly can also be solved quickly

b) It determines if all polynomial problems can be solved in exponential time

c) It relates to the halting problem

d) It deals with parallel processing capabilities

8. What does it mean for a problem to be in class EXP?

a) It can be solved in exponential time

b) It can be solved in polynomial time

c) It can be solved in logarithmic time

d) It can be solved in constant time

9. Which of the following is a common method to show a problem is NP-complete?

a) Reduction from an NP problem

RAAK College of Engineering & Technology

Dr. S. SEENIVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

b) Reduction from an NP-hard problem

c) Reduction from a P problem

d) Reduction from a PSPACE problem

10. Which of the following is true for an NP-complete problem?

a) It is in NP and all problems in NP can be reduced to it

b) It is in P and all problems in NP can be reduced to it

c) It is not in NP but all problems in NP can be reduced to it

d) It is neither in P nor in NP

11. What does the class co-NP consist of?

a) Problems whose complements are in NP

b) Problems that are both in P and NP

c) Problems that are neither in P nor NP

d) Problems that can be solved in constant time

12. What is the time complexity of the Bubble Sort algorithm?

a) O(nlog n)O(n \log n)O(nlogn)

b) O(n)O(n)O(n)

c) O(n2)O(n^2)O(n2)

d) O(2n)O(2^n)O(2n)

13. Which algorithm has a time complexity of O(nlog n)O(n \log n)O(nlogn)?

a) Insertion Sort

b) Merge Sort

c) Bubble Sort

d) Selection Sort

14. What is the space complexity of Depth-First Search (DFS) in a graph with VVV vertices?

a) O(V+E)O(V + E)O(V+E)

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK College of Engineering & Technology

b) O(V)O(V)O(V)

c) O(E)O(E)O(E)

d) O(V2)O(V^2)O(V2)

15. What is the worst-case time complexity of Quick Sort?

a) O(nlog n)O(n \log n)O(nlogn)

b) O(n)O(n)O(n)

c) O(n2)O(n^2)O(n2)

d) O(2n)O(2^n)O(2n)

16. Which complexity class represents problems solvable in exponential space?

a) P

b) NP

c) PSPACE

d) EXPSPACE

17. Which of the following problems is known to be undecidable?

a) Sorting a list

b) Multiplying two numbers

c) The Halting Problem

d) Finding the shortest path in a graph

18. What does the term "polynomial-time reduction" mean?

a) Transforming one problem into another in polynomial time

b) Reducing the size of a dataset in polynomial time

c) Solving a problem in polynomial time

d) None of the above

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

19. What is the Big-O notation used for?

a) To describe the worst-case complexity of an algorithm

b) To describe the best-case complexity of an algorithm

c) To describe the average-case complexity of an algorithm

d) To describe the exact running time of an algorithm

20. Which complexity class represents problems that are solvable in non-deterministic polynomial time and verifiable in polynomial time?

a) P

b) NP

c) NP-complete

d) NP-hard

21. What is the purpose of the Cook-Levin theorem?

a) To show that SAT is NP-complete

b) To prove $P \neq NP$

c) To establish the concept of polynomial time

d) To demonstrate the equivalence of different models of computation

22. What does it mean for a problem to be in class BPP (Bounded-error Probabilistic Polynomial time)?

a) It can be solved by a probabilistic Turing machine in polynomial time with error probability less than 1/3

b) It can be solved by a deterministic Turing machine in polynomial time

c) It can be solved by a probabilistic Turing machine in exponential time

d) It can be solved by a non-deterministic Turing machine in polynomial time

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

23. What is the time complexity of the Fast Fourier Transform (FFT)?

a) O(n2)O(n^2)O(n2)

b) O(nlog n)O(n \log n)O(nlogn)

c) O(nlog n2)O(n \log n^2)O(nlogn2)

d) O(n)O(n)O(n)

24. Which of the following is a common characteristic of NP-complete problems?

- a) They are all in NP

b) Any NP problem can be reduced to them in polynomial time

c) They are the hardest problems in NP

d) All of the above

25. What does it mean if P = NP?

a) Every problem that can be verified in polynomial time can also be solved in polynomial time

b) Every problem that can be solved in polynomial time can also be verified in polynomial time

c) Polynomial time problems cannot be solved

d) Non-deterministic polynomial time problems cannot be verified

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

Certificate of Completion

2021-2022

This is to certify that Mr/Ms .....PUSHPA.R.....

Year...IV.... Department...CSE... has successfully Completed the Value added course.

SCORE: ...92.....

COURSE TITLE: ...COMPUTATIONAL...COMPLEXITY.....

COURSE DURATION: ..9/8/21...to 13/8/21.

HOD

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110.

PRINCIPAL

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES
2021-2022
Department of Computer Science and Engineering
21CSE02- Game Theory

MARK SHEET

Sl. No	Register Number	Student Name	Marks
1	19TD1501	ABARNA .V	92
2	19TD1502	ABDUL RAHMAN .MA	92
3	19TD1503	ABIRAMI .K	96
4	19TD1504	BALAJI .K	96
5	19TD1505	BHARATHKUMARAN .M	92
6	19TD1506	CHARUMATHY .K	92
7	19TD1507	DHAKSHAYINI .S	96
8	19TD1508	DHANUSHKODI. P	96
9	19TD1509	GOUTHAM .G	92
10	19TD1510	GOWTHAM .V	92
11	19TD1511	JEEVANDHAMANI .M	96
12	19TD1512	JOTHI .M	96
13	19TD1513	KARTHI .P	92
14	19TD1514	KAVIARASAN .K	92
15	19TD1515	KARMALAJAY	92
16	19TD1516	KESHOR .M	96
17	19TD1517	MALLIGA .B	96

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

18	19TD1518	MANIKANDAN.R	92
19	19TD1519	MARZIA.M	92
20	19TD1520	MUKTHAR SHAKIR. K	96
21	19TD1521	NAMBIRAJU .P	96
22	19TD1522	NAVEENKUMAR .C	92
23	19TD1523	PAVITHRA .P	92
24	19TD1524	PRAISEN .B	96
25	19TD1525	PRAVEENKUMAR .A	96
26	19TD1526	PREETHA .K	92
27	19TD1527	RICHARD ANTONY .C	92
28	19TD1528	MONISHA. S	92
29	19TD1529	SABANA BANU. S	96
30	19TD1530	SAKTHIBALAN .V	96
31	19TD1531	SANDHIYA. A	92
32	19TD1532	SATHISHKUMAR .S	92
33	19TD1533	SENTHAMIZHAN .S	96
34	19TD1534	SHAMILI. B	96
35	19TD1535	SHIFANA FERVEEN .I	92
36	19TD1536	SHIYAMKUMAR .V	92
37	19TD1537	SOWMIYA .J	96
38	19TD1538	SUBASRI .S	96

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

39	19TD1539	SWETHA .T	92
40	19TD1540	SYED VAHITH. V	92
41	19TD1541	VIJAY .N	96
42	19TD1542	VINODHINI .B	96
43	19TD1543	VINOTHBABU	92
44	19TD1544	YOGESH .V	92
45	19TD1545	YOVEL MISONRAJ .D	92
46	19TDL011	JAFFERSET.S	92

HOD

PRINCIPAL

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK
COLLEGE OF ENGINEERING AND TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES

2021-2022
Department of Computer Science and Engineering
21CSE02- Game Theory

NAME:

CLASS:

DATE:

1. What is game theory primarily concerned with?
   a) The study of random events
   b) The study of decision-making in competitive situations
   c) The study of cooperative behavior
   d) The study of physical games
   Answer: b) The study of decision-making in competitive situations

2. Who is considered the founder of modern game theory?
   a) John Nash
   b) John von Neumann
   c) John Maynard Keynes
   d) Adam Smith
   Answer: b) John von Neumann

3. What is a Nash equilibrium?
   a) A situation where players do not reach an optimal outcome
   b) A situation where each player's strategy is optimal given the strategies of all other players
   c) A situation where players change their strategies continuously
   d) A situation where only one player benefits
   Answer: b) A situation where each player's strategy is optimal given the strategies of all other players

4. Which of the following is an example of a zero-sum game?
   a) Prisoner's Dilemma
   b) Chess
   c) Stag Hunt
   d) Public Goods Game
   Answer: b) Chess

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

5. In game theory, what is a "strategy"?
   a) A player's plan of action for all possible scenarios in a game
   b) A random choice made by a player
   c) The outcome of a game
   d) The rules governing a game
   Answer: a) A player's plan of action for all possible scenarios in a game

6. What does "dominant strategy" mean in game theory?
   a) A strategy that always results in the highest payoff for a player
   b) A strategy that results in the lowest payoff
   c) A strategy that is better than any other strategy for one player, regardless of what the other players do
   d) A strategy that is never used
   Answer: c) A strategy that is better than any other strategy for one player, regardless of what the other players do

7. What is the key feature of a zero-sum game?
   a) The sum of the payoffs to all players is zero in every possible outcome
   b) Only one player can win
   c) The game cannot be solved
   d) Cooperation between players is required
   Answer: a) The sum of the payoffs to all players is zero in every possible outcome

8. In the context of the Prisoner's Dilemma, what is the best outcome for both players collectively?
   a) Both players confess
   b) Both players remain silent
   c) One player confesses, and the other remains silent
   d) Both players refuse to play
   Answer: b) Both players remain silent

9. Which concept explains why players might not cooperate even if it is in their best interest?
   a) Dominant strategy
   b) Nash equilibrium
   c) Pareto efficiency
   d) Prisoner's Dilemma
   Answer: d) Prisoner's Dilemma

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK College of Engineering & Technology

10. What is Pareto efficiency?
    a) A situation where it is impossible to make one player better off without making another player worse off
    b) A situation where one player wins everything
    c) A situation where cooperation leads to worse outcomes for all
    d) A situation where all players receive equal payoffs
    Answer: a) A situation where it is impossible to make one player better off without making another player worse off

11. What is a mixed strategy in game theory?
    a) A strategy that involves randomizing over different actions
    b) A strategy that involves always choosing the same action
    c) A strategy that changes based on past outcomes
    d) A strategy that only one player uses
    Answer: a) A strategy that involves randomizing over different actions

12. Which of the following best describes a cooperative game?
    a) A game where players can form binding agreements
    b) A game where players act independently
    c) A game where the sum of payoffs is zero
    d) A game without any Nash equilibrium
    Answer: a) A game where players can form binding agreements

13. What is the Minimax theorem associated with?
    a) The optimal strategy in zero-sum games
    b) The formation of Nash equilibrium
    c) The strategies in cooperative games
    d) The outcomes in non-zero-sum games
    Answer: a) The optimal strategy in zero-sum games

14. In a repeated game, what is a "trigger strategy"?
    a) A strategy that is always used
    b) A strategy that punishes opponents for deviating from a cooperative strategy
    c) A strategy that involves random actions
    d) A strategy that cannot be used more than once
    Answer: b) A strategy that punishes opponents for deviating from a cooperative strategy

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

15. Which game theory concept is used to model evolutionary processes?
    a) Nash equilibrium
    b) Dominant strategy
    c) Evolutionarily Stable Strategy (ESS)
    d) Zero-sum game
    Answer: c) Evolutionarily Stable Strategy (ESS)

16. In a game tree, what do the nodes represent?
    a) The decisions or moves of the players
    b) The outcomes of the game
    c) The payoffs for the players
    d) The rules of the game
    Answer: a) The decisions or moves of the players

17. Which of the following is an example of a non-cooperative game?
    a) Prisoner's Dilemma
    b) Public Goods Game
    c) Bargaining Game
    d) Coalition Game
    Answer: a) Prisoner's Dilemma

18. What is backward induction used for in game theory?
    a) To determine the optimal strategy in sequential games
    b) To find Nash equilibria in simultaneous games
    c) To analyze mixed strategies
    d) To form coalitions in cooperative games
    Answer: a) To determine the optimal strategy in sequential games

19. Which of the following is true for an Evolutionarily Stable Strategy (ESS)?
    a) It cannot be invaded by a small number of mutants
    b) It maximizes the payoff for all players
    c) It is always a mixed strategy
    d) It is not affected by mutations
    Answer: a) It cannot be invaded by a small number of mutants

20. In a game with perfect information, what is known to all players?
    a) The payoffs for each outcome
    b) The strategies of each player
    c) All previous actions and moves

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

d) The optimal strategy
Answer: c) All previous actions and moves

21. What does the "Folk Theorem" pertain to in game theory?
a) Equilibria in repeated games
b) Strategies in zero-sum games
c) Payoffs in cooperative games
d) Equilibria in one-shot games
Answer: a) Equilibria in repeated games

22. Which game theory concept deals with how to distribute payoffs in cooperative games?
a) Shapley value
b) Nash equilibrium
c) Dominant strategy
d) Mixed strategy
Answer: a) Shapley value

23. What is a "Bayesian game"?
a) A game in which players have incomplete information about other players
b) A game that can be solved using backward induction
c) A game with perfect information
d) A zero-sum game
Answer: a) A game in which players have incomplete information about other players

24. In a sequential game, what does a "subgame perfect equilibrium" ensure?
a) Optimal strategies at every stage of the game
b) A single Nash equilibrium
c) Randomization of strategies
d) A non-cooperative outcome
Answer: a) Optimal strategies at every stage of the game

25. What is "common knowledge" in the context of game theory?
a) Information that all players know, and they all know that the others know it as well
b) Information that is known to at least one player
c) Strategies that all players use
d) Payoffs that are the same for all players
Answer: a) Information that all players know, and they all know that the others know it as well

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES

2021-2022

Department of Computer Science Engineering

21CSE02- Game Theory

NAME: MARZIA.M
CLASS: III | CSE
DATE: 20/08/2021

23/25 92%

1. What is game theory primarily concerned with?
   a) The study of random events
   b) The study of decision-making in competitive situations
   c) The study of cooperative behavior
   d) The study of physical games

2. Who is considered the founder of modern game theory?
   a) John Nash
   b) John von Neumann
   c) John Maynard Keynes
   d) Adam Smith

3. What is a Nash equilibrium?
   a) A situation where players do not reach an optimal outcome
   b) A situation where each player's strategy is optimal given the strategies of all other players
   c) A situation where players change their strategies continuously
   d) A situation where only one player benefits

4. Which of the following is an example of a zero-sum game?
   a) Prisoner's Dilemma
   b) Chess
   c) Stag Hunt
   d) Public Goods Game

5. In game theory, what is a "strategy"?
   a) A player's plan of action for all possible scenarios in a game
   b) A random choice made by a player
   c) The outcome of a game
   d) The rules governing a game

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

6. What does "dominant strategy" mean in game theory?
   a) A strategy that always results in the highest payoff for a player
   b) A strategy that results in the lowest payoff
   c) A strategy that is better than any other strategy for one player, regardless of what the other players do
   d) A strategy that is never used

7. What is the key feature of a zero-sum game?
   a) The sum of the payoffs to all players is zero in every possible outcome
   b) Only one player can win
   c) The game cannot be solved
   d) Cooperation between players is required

8. In the context of the Prisoner's Dilemma, what is the best outcome for both players collectively?
   a) Both players confess
   b) Both players remain silent
   c) One player confesses, and the other remains silent
   d) Both players refuse to play

9. Which concept explains why players might not cooperate even if it is in their best interest?
   a) Dominant strategy
   b) Nash equilibrium
   c) Pareto efficiency
   d) Prisoner's Dilemma

10. What is Pareto efficiency?
    a) A situation where it is impossible to make one player better off without making another player worse off
    b) A situation where one player wins everything
    c) A situation where cooperation leads to worse outcomes for all
    d) A situation where all players receive equal payoffs

11. What is a mixed strategy in game theory?
    a) A strategy that involves randomizing over different actions
    b) A strategy that involves always choosing the same action
    c) A strategy that changes based on past outcomes
    d) A strategy that only one player uses

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

12. Which of the following best describes a cooperative game?
a) A game where players can form binding agreements
b) A game where players act independently
c) A game where the sum of payoffs is zero
d) A game without any Nash equilibrium

13. What is the Minimax theorem associated with?
a) The optimal strategy in zero-sum games
b) The formation of Nash equilibrium
c) The strategies in cooperative games
d) The outcomes in non-zero-sum games

14. In a repeated game, what is a "trigger strategy"?
a) A strategy that is always used
b) A strategy that punishes opponents for deviating from a cooperative strategy
c) A strategy that involves random actions
d) A strategy that cannot be used more than once

15. Which game theory concept is used to model evolutionary processes?
a) Nash equilibrium
b) Dominant strategy
c) Evolutionarily Stable Strategy (ESS)
d) Zero-sum game

16. In a game tree, what do the nodes represent?
a) The decisions or moves of the players
b) The outcomes of the game
c) The payoffs for the players
d) The rules of the game

17. Which of the following is an example of a non-cooperative game?
a) Prisoner's Dilemma
b) Public Goods Game
c) Bargaining Game
d) Coalition Game

18. What is backward induction used for in game theory?
a) To determine the optimal strategy in sequential games
b) To find Nash equilibria in simultaneous games
c) To analyze mixed strategies
d) To form coalitions in cooperative games

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK College of Engineering & Technology

19. Which of the following is true for an Evolutionarily Stable Strategy (ESS)?
a) It cannot be invaded by a small number of mutants
b) It maximizes the payoff for all players
c) It is always a mixed strategy
d) It is not affected by mutations

20. In a game with perfect information, what is known to all players?
a) The payoffs for each outcome
b) The strategies of each player
c) All previous actions and moves
d) The optimal strategy

21. What does the "Folk Theorem" pertain to in game theory?
a) Equilibria in repeated games
b) Strategies in zero-sum games
c) Payoffs in cooperative games
d) Equilibria in one-shot games

22. Which game theory concept deals with how to distribute payoffs in cooperative games?
a) Shapley value
b) Nash equilibrium
c) Dominant strategy
d) Mixed strategy

23. What is a "Bayesian game"?
a) A game in which players have incomplete information about other players
b) A game that can be solved using backward induction
c) A game with perfect information
d) A zero-sum game

24. In a sequential game, what does a "subgame perfect equilibrium" ensure?
a) Optimal strategies at every stage of the game
b) A single Nash equilibrium
c) Randomization of strategies
d) A non-cooperative outcome

25. What is "common knowledge" in the context of game theory?
a) Information that all players know, and they all know that the others know it as well
b) Information that is known to at least one player
c) Strategies that all players use
d) Payoffs that are the same for all players

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

Certificate of Completion

2021-2022

This is to certify that Mr/Ms .....SWETHA..T.....

Year...III... Department....CSE... has successfully Completed the Value added course.

SCORE: .....92.....

COURSE TITLE: .....GAME...THEORY.....

COURSE DURATION: 9/8/21...to.14/8/21

HOD

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

PRINCIPAL

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES
2021-2022

Department of Computer Science and Engineering

21CSE03-Functional Programming Languages

MARK SHEET

Sl. No	Register Number	Student Name	MARKS
1	20TD0902	ARAVIND. V	92
2	20TD0903	ASRAF ALI. A	96
3	20TD0904	BHARATHI. S	96
4	20TD0905	BHUVANESWARAN. U	92
5	20TD0906	DINESH KUMAR. T	92
6	20TD0907	FAHMETHA. J	96
7	20TD0908	FROSE. S	96
8	20TD0909	GNANAMOORTHI. E	92
9	20TD0910	HEMALAKSHMI. J	92
10	20TD0911	JASMEEN. O	96
11	20TD0912	JAYASUDHA. S	96
12	20TD0913	KARTHIKA. K	92
13	20TD0914	KAVIARASAN. S	92
14	20TD0915	KAVIYA. K	92

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road
Sulthanpet Post,
Puducherry - 605 110

15	20TD0916	MALAVIKA. K	96
16	20TD0917	MARIMUTHU. N	96
17	20TD0918	MERVIN IMMANUVEL. S	92
18	20TD0919	NATRAJAN. R	92
19	20TD0920	PARKAVI. S	96
20	20TD0922	RANJITH. A	96
21	20TD0923	SATCHIDHANANDHAM. A	92
22	20TD0924	SNEGA. G	92
23	20TD0925	VIJAYA LAKSHMI. L	96
24	20TD0926	VISHNU PRIYA. V	96
25	20TD0927	YASMIN. A	92
26	20TDL047	MOHANRAJ. D	92
27	20TDL048	OVIYA P	92
28	20TDL049	PATCHAIAPPAN. M	96
29	20TDL050	PAVITHRA P	96
30	20TDL051	REENA KUMARI. J	92

HOD

RAAK College of Engineering & Technology

PRINCIPAL

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK
COLLEGE OF ENGINEERING AND TECHNOLOGY
(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES

2021-2022

Department of Computer Science and Engineering

21CSE03-Functional Programming Languages

NAME:
CLASS:
DATE:

1. What is a key characteristic of functional programming languages?
   a) Imperative state changes
   b) Mutable data
   c) First-class functions
   d) Loop constructs
   Answer: c) First-class functions

2. Which of the following is a pure functional programming language?
   a) Python
   b) Haskell
   c) Java
   d) C++
   Answer: b) Haskell

3. In functional programming, what does immutability refer to?
   a) Variables that can be changed after they are initialized
   b) Variables that cannot be changed after they are initialized
   c) Functions that cannot be reused
   d) Functions that change their behavior
   Answer: b) Variables that cannot be changed after they are initialized

4. Which concept is central to functional programming and refers to the use of functions as values?
   a) Recursion
   b) Higher-order functions
   c) Looping
   d) Mutable state
   Answer: b) Higher-order functions

5. What does "referential transparency" mean in the context of functional programming?
   a) Functions always produce different outputs for the same inputs
   b) Functions always produce the same output for the same inputs
   c) Variables can be changed at any time

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 11(

d) The order of function calls affects the result
Answer: b) Functions always produce the same output for the same inputs

6. Which functional programming language is known for its lazy evaluation?
   a) Haskell
   b) Scheme
   c) Lisp
   d) Erlang
   Answer: a) Haskell

7. What is a lambda expression in functional programming?
   a) A way to define a named function
   b) A way to define an anonymous function
   c) A method for debugging code
   d) A loop construct
   Answer: b) A way to define an anonymous function

8. Which of the following is a common feature in functional programming languages to handle operations like map, filter, and reduce?
   a) Loop constructs
   b) Higher-order functions
   c) Conditional statements
   d) Mutable variables
   Answer: b) Higher-order functions

9. What is "currying" in functional programming?
   a) Transforming a function that takes multiple arguments into a series of functions that each take a single argument
   b) Combining two functions into a single function
   c) Creating a function that returns a constant value
   d) Executing a function with default arguments
   Answer: a) Transforming a function that takes multiple arguments into a series of functions that each take a single argument

10. In functional programming, what is a "monad"?
    a) A design pattern for encapsulating behavior
    b) A way to handle side effects
    c) A type of loop construct
    d) A data structure for storing elements
    Answer: b) A way to handle side effects

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

11. Which language feature allows functions to be passed as arguments to other functions or returned as results?
    a) Polymorphism
    b) Encapsulation
    c) First-class functions
    d) Inheritance
    Answer: c) First-class functions

12. What is the purpose of a "pure function"?
    a) To modify global state
    b) To perform I/O operations
    c) To ensure consistent output for the same input without side effects
    d) To execute in constant time
    Answer: c) To ensure consistent output for the same input without side effects

13. In the context of functional programming, what is "pattern matching"?
    a) A way to iterate over collections
    b) A mechanism to check a value against a pattern
    c) A method for optimizing performance
    d) A technique for sorting data
    Answer: b) A mechanism to check a value against a pattern

14. Which of the following languages was one of the first to support functional programming concepts?
    a) Java
    b) Lisp
    c) C++
    d) Pascal
    Answer: b) Lisp

15. What does "lazy evaluation" mean in functional programming?
    a) Computing values as soon as they are bound to a variable
    b) Deferring computation until the value is needed
    c) Evaluating expressions in a strict order
    d) Ignoring computations that are not needed
    Answer: b) Deferring computation until the value is needed

16. What is "tail recursion" in functional programming?
    a) A recursion where the recursive call is the last operation in the function
    b) A recursion that occurs only at the beginning of a function
    c) A recursion that does not use a base case
    d) A recursion that handles infinite loops

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

Answer: a) A recursion where the recursive call is the last operation in the function

17. Which functional programming language was specifically designed for concurrent and distributed systems?
    a) Scala
    b) Erlang
    c) Haskell
    d) F#
    Answer: b) Erlang

18. What is the result of applying the "map" function to a list?
    a) A single aggregated value
    b) A transformed list where each element is the result of applying a function to the original elements
    c) A sorted version of the list
    d) A filtered list based on a condition
    Answer: b) A transformed list where each element is the result of applying a function to the original elements

19. Which of the following best describes "functional composition"?
    a) Combining multiple functions to form a single function
    b) Dividing a function into multiple sub-functions
    c) Iterating over elements of a list
    d) Storing functions in a data structure
    Answer: a) Combining multiple functions to form a single function

20. What does "idempotent" mean with respect to a function in functional programming?
    a) A function that can be called multiple times without changing the result beyond the initial application
    b) A function that returns a different result each time it is called
    c) A function that modifies global state
    d) A function that always returns a constant value
    Answer: a) A function that can be called multiple times without changing the result beyond the initial application

21. Which functional programming language is a dialect of ML and developed by Microsoft?
    a) Haskell
    b) F#
    c) Scheme
    d) Clojure
    Answer: b) F#

22. In functional programming, what is a "functor"?

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

a) A data structure that can be mapped over
b) A function that performs side effects
c) A type of loop
d) A variable that changes state
Answer: a) A data structure that can be mapped over

23. What is "memoization" in the context of functional programming?
a) Storing results of expensive function calls and reusing the results when the same inputs occur again
b) Breaking a problem into sub-problems
c) Combining multiple functions into one
d) Performing I/O operations
Answer: a) Storing results of expensive function calls and reusing the results when the same inputs occur again

24. Which of the following best describes the term "closure" in functional programming?
a) A function along with its lexical environment
b) A function that never returns
c) A function that only works with numbers
d) A loop that terminates early
Answer: a) A function along with its lexical environment

25. Which functional programming language is built on the JVM and interoperates with Java?
a) Erlang
b) Scala
c) Haskell
d) F#
Answer: b) Scala

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

VALUE ADDED COURSES
2021-2022
Department of Computer Science Engineering
21CSE03-Functional Programming Languages

NAME: FROSE. S
CLASS: II / CSE
DATE: 20/08/2021

1. What is a key characteristic of functional programming languages?
   a) Imperative state changes
   b) Mutable data
   c) First-class functions
   d) Loop constructs

24/25 96%

2. Which of the following is a pure functional programming language?
   a) Python
   b) Haskell
   c) Java
   d) C++
3. In functional programming, what does immutability refer to?
   a) Variables that can be changed after they are initialized
   b) Variables that cannot be changed after they are initialized
   c) Functions that cannot be reused
   d) Functions that change their behavior

4. Which concept is central to functional programming and refers to the use of functions as values?
   a) Recursion
   b) Higher-order functions
   c) Looping
   d) Mutable state
5. What does "referential transparency" mean in the context of functional programming?
   a) Functions always produce different outputs for the same inputs
   b) Functions always produce the same output for the same inputs
   c) Variables can be changed at any time
   d) The order of function calls affects the result

6. Which functional programming language is known for its lazy evaluation?
   a) Haskell
   b) Scheme
   c) Lisp
   d) Erlang

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

7. What is a lambda expression in functional programming?
   a) A way to define a named function
   b) A way to define an anonymous function
   c) A method for debugging code
   d) A loop construct
8. Which of the following is a common feature in functional programming languages to handle operations like map, filter, and reduce?
   a) Loop constructs
   b) Higher-order functions
   c) Conditional statements
   d) Mutable variables

9. What is "currying" in functional programming?
   a) Transforming a function that takes multiple arguments into a series of functions that each take a single argument
   b) Combining two functions into a single function
   c) Creating a function that returns a constant value
   d) Executing a function with default arguments

10. In functional programming, what is a "monad"?
    a) A design pattern for encapsulating behavior
    b) A way to handle side effects
    c) A type of loop construct
    d) A data structure for storing elements

11. Which language feature allows functions to be passed as arguments to other functions or returned as results?
    a) Polymorphism
    b) Encapsulation
    c) First-class functions
    d) Inheritance

12. What is the purpose of a "pure function"?
    a) To modify global state
    b) To perform I/O operations
    c) To ensure consistent output for the same input without side effects
    d) To execute in constant time

13. In the context of functional programming, what is "pattern matching"?
    a) A way to iterate over collections
    b) A mechanism to check a value against a pattern
    c) A method for optimizing performance
    d) A technique for sorting data

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

14. Which of the following languages was one of the first to support functional programming concepts?
    a) Java
    b) Lisp
    c) C++
    d) Pascal

15. What does "lazy evaluation" mean in functional programming?
    a) Computing values as soon as they are bound to a variable
    b) Deferring computation until the value is needed
    c) Evaluating expressions in a strict order
    d) Ignoring computations that are not needed

16. What is "tail recursion" in functional programming?
    a) A recursion where the recursive call is the last operation in the function
    b) A recursion that occurs only at the beginning of a function
    c) A recursion that does not use a base case
    d) A recursion that handles infinite loops

17. Which functional programming language was specifically designed for concurrent and distributed systems?
    a) Scala
    b) Erlang
    c) Haskell
    d) F#

18. What is the result of applying the "map" function to a list?
    a) A single aggregated value
    b) A transformed list where each element is the result of applying a function to the original elements
    c) A sorted version of the list
    d) A filtered list based on a condition

19. Which of the following best describes "functional composition"?
    a) Combining multiple functions to form a single function
    b) Dividing a function into multiple sub-functions
    c) Iterating over elements of a list
    d) Storing functions in a data structure

20. What does "idempotent" mean with respect to a function in functional programming?
    a) A function that can be called multiple times without changing the result beyond the initial application
    b) A function that returns a different result each time it is called
    c) A function that modifies global state
    d) A function that always returns a constant value

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK College of Engineering & Technology

21. Which functional programming language is a dialect of ML and developed by Microsoft?
    a) Haskell
    b) F#
    c) Scheme
    d) Clojure

22. In functional programming, what is a "functor"?
    a) A data structure that can be mapped over
    b) A function that performs side effects
    c) A type of loop
    d) A variable that changes state

23. What is "memoization" in the context of functional programming?
    a) Storing results of expensive function calls and reusing the results when the same inputs occur again
    b) Breaking a problem into sub-problems
    c) Combining multiple functions into one
    d) Performing I/O operations

24. Which of the following best describes the term "closure" in functional programming?
    a) A function along with its lexical environment
    b) A function that never returns
    c) A function that only works with numbers
    d) A loop that terminates early

25. Which functional programming language is built on the JVM and interoperates with Java?
    a) Erlang
    b) Scala
    c) Haskell
    d) F#

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110

RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
An ISO 9001:2015 Certified Institution

Certificate of Completion

2021-2022

This is to certify that Mr/Ms .....SNEGA.S.....

Year...II.... Department...CSE... has successfully Completed the Value added course.

SCORE: .....92.....

COURSE TITLE: .....FUNCTIONA PROGAMMING LANGNAGE.....

COURSE DURATION: ..9.1.8.21..to..14.1.8.21

J. Anil.

HOD

RAAK College of Engineering & Technology

Dr. S. SEENUVASAMURTHI, M.E., Ph.D.
PRINCIPAL
RAAK College of Engineering & Technology
No.1, Muthupillai Palayam Road,
Sulthanpet Post,
Puducherry - 605 110.

PRINCIPAL