Internal Assessment Examination (2023)

Dept: CSE   Semester: 5th

Sub: Software Engineering(PCC-CS501)

1. What are the different parameters of a software product? Write down the problems with using Lines of Code to measure the size of a product. What is the importance of SRS documents? 1+2+2

2. Explain prototyping model. Does the construction of prototype always increase the overall cost of software development? Write down the differences between prototyping model and evolutionary model. 2+1+2

3. A device driver software is to be developed of size 60,000 LOC. The following cost drivers are considered: low reliability: 0.88, high product complexity:1.15, low application experience : 1.13, other cost drivers assumed to be nomial:1.00. Calculate Effort, Development Time and number of engineers required. 2+2+1

3.6 a(60)

1.2

2.5

$E = a_i (KLOC)^{b_i} \cdot EAF$

$D = c_i (E)^{d_i}$. $P = \frac{E}{D}$

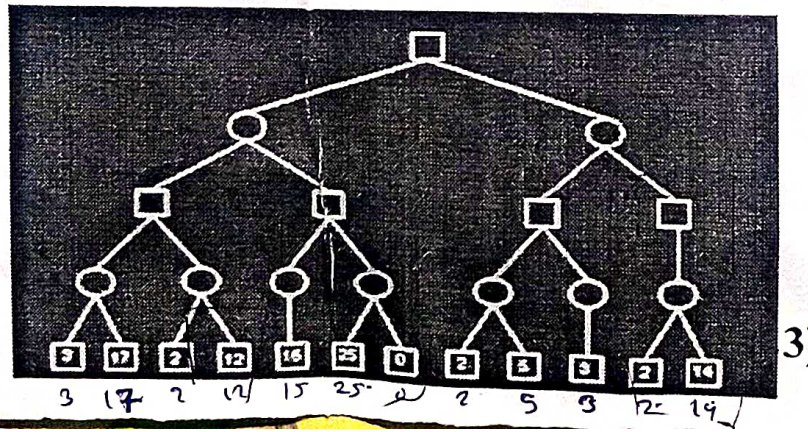
Dept: CSE **Semester: 5th**

Sub: Artificial Intelligence(PEC-CS502)

1. Define Rational Agent? Explain utility-based agent with block diagram. Write down the difference between utility-based agent and goal-based agent. 1+3+1

2. Explain generation cost and heuristic cost, where are they used? Write down the limitations of Hill climbing algorithm. 2+3

3. Write down the differences between informed search and uninformed search. Apply alpha-beta pruning algorithm for the given graph and show the pruned vertices. 2+3



JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
JGEC/B.TECH./CSE /PCC-CS502/2023
DISCRETE MATHEMATICS (FIRST CLASS TEST)

Full Marks: 15 Time: 45 Minutes

Answer any ***three*** questions 3x5=15

1. iii) Define Cartesian Product of sets, power set of a set, and Partition with the help of suitable examples. 3
   iv) Prove that $[\bar{A} \cap (\bar{B} \cup \bar{C})] \cap [\bar{A} \cup (B \cap \bar{C})] = \emptyset$ 2

2. iii) Define Binary relation and equivalence relation with example suitable examples. 3
   iv) A relation ρ is defined on the set Z by aρb if and only if a-b is divisible by 5, $for\ a, b \in Z$. Examine if ρ is an equivalence relation on Z. 2

3. iii) Define Partial order relation (***Poset***) with example. 2
   iv) Let S be the set of all positive divisor 30. $S = \{1, 2, 3, 5, 6, 10, 15, 30\}$. 2+1
   Prove that $(S, \leq)$ is a Poset, where $a \leq b$ means a is a divisor of b, $for\ a, b \in S$.
   Draw the covering diagram of the poset $(S, \leq)$.

4. iii) Define Group, Ring and Field with examples. 3
   iv) Examine if the following system is group 2
   $(Z, o), where\ a\ o\ b = a + b + ab, where\ a, b \in Z$

5. iii) Find $f.g,\ g.f,\ f^{-1} and\ g^{-1}$ where 4
   $$f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 2 & 4 & 3 & 5 & 6 & 1 \end{pmatrix} \text{ and } g = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 1 & 6 & 4 & 5 & 3 & 2 \end{pmatrix}$$
   iv) Prove that the following mapping is bijection. 1
   $f: Z \times Z \to Z\ defined\ by\ f(m, n) = mn, where\ (m, n) \in Z \times Z$

JALPAIGURI GOVERNMENT ENGINEERING COLLEGE
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ODD SEM 2023

Paper Name: Operating System
Full Marks: 15
Paper code: PCC-CS504
Class Test: 1ST
Time: 40 minutes
Date: 13/09/2023

Answer any three questions.

1. What is semaphore? Give a solution of second reader-writers problem with semaphore. (1 + 4)
2. What is indefinite postponement? What is the solution of it? If a computer has six tape drives, with n processes competing for them and each process may need two drives, what is the maximum value of n for the system to be deadlock free? (2 + 1 + 2)
3. Given that at a particular time of computation, the value of a counting semaphore is 7, then if 20 P operations and 15 V operations were completed on this semaphore, what is the resulting value of the semaphore? Write an algorithm to find out safe sequence of a system when several process request for several resources. (2 + 3)
4. "Context switching is a pure overhead to the system" -Justify the statement. What are the necessary and sufficient conditions for deadlock? (2 + 3)

DATABASE MANAGEMENT SYSTEMS (PCC-CS503) CSE, Internal-1 Date of Exam-12.09.23

Full Marks: 15 Time: 45 Minutes

Answer any three questions: (3 X 5 Marks = 15 Marks)

1) What is Foreign key? Describe the concept of specialization and generalization in context of E-R data model. What do you mean by data independence? 1+3+1

2) a) Explain in brief 3-schema architecture of DBMS. 2+3

b) Let the following relation schemas be given:

Sailors(sid, sname, rating, age)

Boats(bid, bname, color)

Reserves(sid, bid, day)

Perform the following queries on the tables in relational algebra:

i) Find the color of the boats reserves by Rohit.

ii) Find the name of the sailors who have reserves boat 1019(bid).

3) Find the canonical cover of the following Functional Dependency Set, F={AB→CD, A→E, E→C} 5

4) Explain Different Anomalies that can arise while designing relations in a Database. 5

4425
4925

Operation Research PEC-CS501D CSE, 3rd Year, 1st Semester, 2023 Class test 1, Full Marks-15 ,Time- 45 minutes , Date: 13.09.23

(1). Solve the given transportation table using N/W Corner , Least Cost Method and VAM .Calculate the transportation cost in each **3X3=9**

	1	2	3	4	5	Availability
A	55	30	40	50	50	40
B	35	30	100	45	60	20
C	40	60	95	35	30	40
Requirement	25	10	20	30	15	

or (1) (Solve using simplex method) Maximize $z = 3x_1 + 2x_2$, subject to $5x_1 + x_2 \leq 10$, $4x_1 + 5x_2 \leq 60$, $x_1, x_2 \geq 0$ **9**

2. Using the following cost matrix, determine (a) optimal job assignment (b) the cost of assignments **5+1**

Mechanic		JOB				
		1	2	3	4	5
	A	30	25	33	35	36
	B	23	29	38	23	26
	C	30	27	22	22	22
	D	25	31	29	27	32
	E	27	29	30	24	32