ARTIFICIAL INTELLIGENCE (PEC-IT501B)

Full Marks : 25 **Time : 60Min.**

GROUP-A

1. Answer the following. **5*1=5**

a. Artificial Intelligence is _____.

b. When do we call that the states can be explored safely?

c. Uninformed search is also known as blind _____.

d. _____type of mathematical problems are defined as a set of objects, whose state must satisfy a number of constraints or limitations.

e. _____search agent operates by interleaving computation and action.

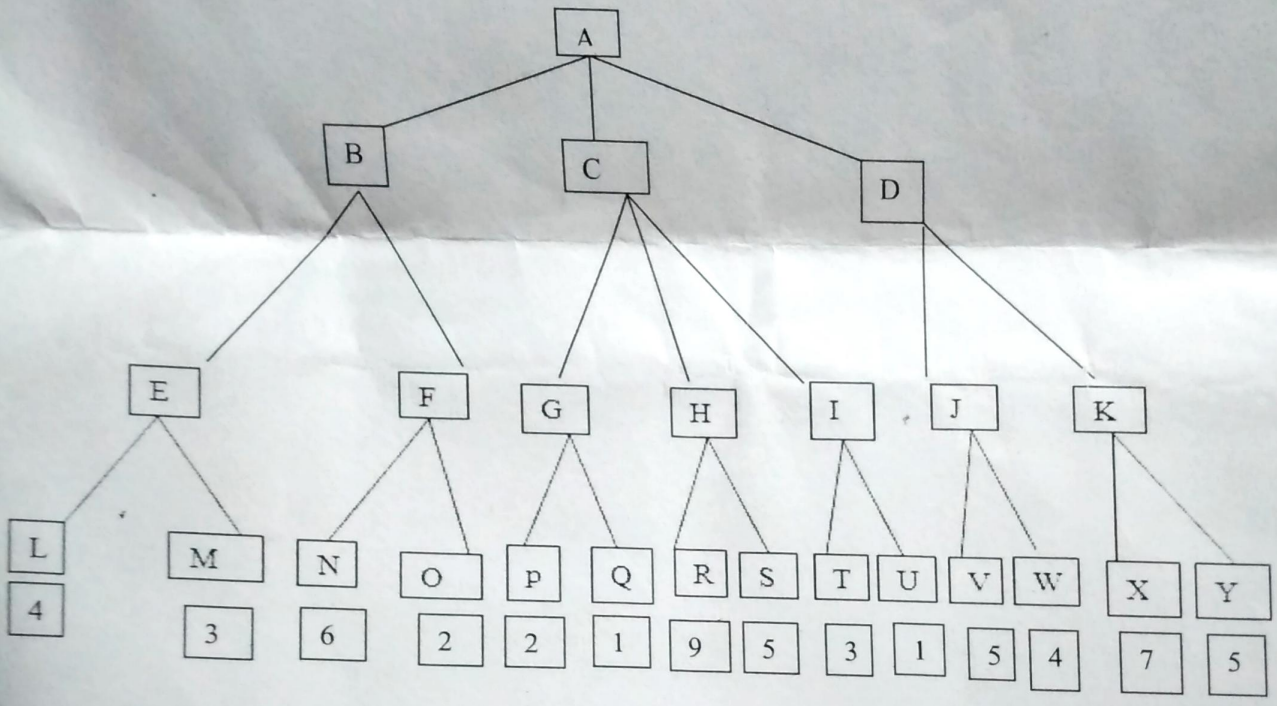
GROUP-B

Short answer type question. **4*5=20**

2. a. When does BFS give optimal solution?

b. What are the three major problems of Hill Climbing Technique? 2+3

3. Consider the following game tree.



Using MINIMAX procedure, determine what moves should be chosen by the maximizer in his first turn?

4. Explain the working principal of simulated annealing algorithm. 5

5. Distinguish between declarative and procedural language. Explain production system. 5

3+2

Q. No.	1A	1b	1c	1d	1e	2	3	4	5
Course Outcome	CO1	CO1	CO1	CO1	CO1	CO2	CO3	CO4	CO5
Bloom's Level (in fig.)	2					1	5	4	4

Bloom's Level: Remember = 1, Understand = 2, Apply =3 Analyze = 4 Evaluate = 5, Create = 6

B. Tech. 5th Semester, Internal Examination, Dept. ...

Constitution of India[MCCS501]

Full Marks : 25 **Time : 60 Min.**

GROUP-A

(Answer all the questions)

1. Which Act provided Governor-General's Executive Council for the first time? [1]
2. State one of the main features of the Government of India Act, 1935. [1]
3. What is the meaning of 'Fraternity' according to the Constitution of India? [1]
4. What does Article-18 of the Constitution deals with? [1]
5. State one function of the Vice President of India. [1]

GROUP-B

6. Differentiate between Indian Councils Act, 1861 and Indian Councils Act, 1892. [5]

OR

Differentiate between Government of India Act, 1935 and Indian Independence Act, 1947. [5]

7. Explain the following-
   a) Liberty
   b) 'India is a Secular State'

OR

Explain the following-
   a) Articles- 20 and 21
   b) Articles- 22 and 23

8. Critically analyze in detail Article- 32 of the Indian Constitution. [5]

OR

Critically analyze the provisions under Articles-25 to 28 of the Indian Constitution.

9. Write notes on the following- [5]
   a) Qualifications required to be elected as the President of India
   b) The election process of the President of India

OR

Write notes on the following-
   a) Impeachment process of the President of India
   b) Legislative function of the President of India

Compiler Design [PCC-CS501]

Full Marks : 25 **Time : 60 Min.**

Group A

1. Objective type questions: $5\times1=5$

(i) Recursive descent parser is _____ parser.

(ii) Relatively, the number of states is high in _____ parser.

(iii) A set of LR(1) items produce in _____ parser.

(iv) _____ has multiple transitions on a state for the same input symbol.

(v) _____ regular expression operators have the least precedence.

Group B

$4\times5=20$

2. Design a DFA directly from the following regular expression.
   a* (a|b)

3. Draw a transition diagram to identify the keywords IF, THEN, ELSE, DO, WHILE, BEGIN, END.

4. Construct the sets of LR (0) items for the following grammar: E→ E + E | E * E | (E) | id

5. Compute the FIRST and FOLLOW sets for each nonterminal of the grammar given below:
   S→Aba | bCA
   A →cBCD | ϵ
   B → CdA | ad
   C →eC | ϵ
   D → bSf | a

OUTCOME BASED EDUCATION (OBE)					
CO mapping With Bloom's Level					
Question No.	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Course Outcome	**CO1**	**CO2**	**CO2**	**CO3**	**CO3**
Bloom's Level	**1**	**4**	**3**	**3**	**4**

Bloom's Level: Remember = 1, Understand = 2, Apply =3 Analyze = 4 Evaluate = 5, Create

B. Tech. 5th Semester, Internal Examination, September 2022

Operating Systems [PCC-CS502]

Full Marks: 25 **Time: 60 Min.**

Group A

1) Objective type questions: 1X5= 5

i) Aging is associated with starvation – True or False

ii) Monitors are used for _____

iii) Banker's algorithm is used to _____

iv) In operating system, each process has its own _____

v) Transient operating system code is a code that _____

Group B

Short Answer type questions: 5X4=20

2) For the processes listed in the table, calculate the average turnaround time and average waiting time, for RR (Quantum=2) and SRTF. 5

Process	Arrival Time	Burst Time
P1	0	3
P2	1	6
P3	4	4
P4	6	2

3) Consider the memory Fragment at any instant of time:

Used	Hole	Used	Hole	Used	Hole	Used	Hole	Used	Hole	Used	Hole
10K	10K	20K	30K	10K	5K	30K	20K	10K	15K	20K	20K

Additional requests for 20K, 10K and 5K are received in this order. At what starting address will these requests be allocated using First Fit, Best Fit and Worst Fit algorithms?

4) 5 processes P_0 through P_4; 3 resource types A (10 instances), B (5instances, and C (7 instances). snapshot at time T_0:

	Max	*Available*	
	A B C	*A B C*	*A B C*
P_0	0 1 0	7 5 3	3 3 2
P_1	2 0 0	3 2 2	
P_2	3 0 2	9 0 2	
P_3	2 1 1	2 2 2	
P_4	0 0 2	4 3 3	

Calculate the Need matrix and check whether the system is in safe state.

5) On a system using Round Robin Scheduling, let s represent the time required to perform a process switch, q represent the RR time quantum, and r represent the average time a process runs before blocking on I/O. Compute formula for CPU efficiency given the following:

i) $q=\infty$ ii) $q>r$ iii) $s<q<r$ iv) $s=q<r$ v) q nearly 0

OUTCOME BASED EDUCATION (OBE)					
CO mapping With Bloom's Level					
Question No.	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**
Course Outcome	**CO2,CO3,CO 4**	**CO2**	**CO4**	**CO3**	**CO2**
Bloom's Level	**1**	**3**	**3**	**3**	**3**

Bloom's Level: Remember = 1, Understand = 2, Apply =3 Analyze = 4 Evaluate = 5, Create

Introduction to Industrial Management (Humanities III)

Full Marks : 25 **Time : 60 Mins.**

SECTION – A

1. Answer all the questions in not more than one or two words. (5x1)

I. Leadership is the element of ________ function of management.

II. The ________ of an event is the difference between the latest time (Li) and the earliest time (Ei).

III. In this organizational structure team member report to several managers at once.

IV. Morals refer to rules provided by an external source. True/False

V. An activity is represented by an ________ and ________ represent start and finish of an activity.

SECTION-B

2. Consider the following table and answer the questions given below:

Activity	Immediate Predecessors	Completion Time
A		2
B		9
C		4
D	A	5
E	D	8
F	E	3
G	B	4
H	G, I	11
I	C	5
J	C	7
K	J	5

a) Draw a network diagram. (1)

b) Compute the LOT and EOT of each event (in the diagram itself) (3)

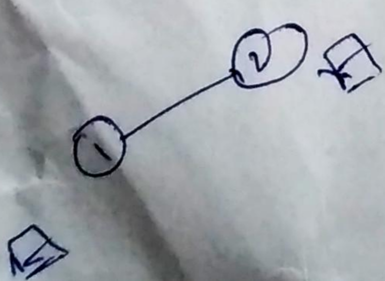
c) Find out the Critical Path and Project Duration. (1)

3. Briefly explain management as a system with an example of your choice. (5)

4. If the employees are satisfied in their workplace, it will lead to greater creativity or if the employees are allowed to be creative, it will lead to greater satisfaction- Justify. (5)

5. Explain the types of floats. (5)

OUTCOME BASED EDUCATION (OBE)					
CO MAPPING WITH BLOOM'S LEVEL					
QNO	1	2	3	4	5
COURSE OUTCOME	CO1	CO4	CO1	CO2	CO1
BLOOM'S LEVEL	UNDERSTAND L2	ANALYZE L4	UNDERSTAND L2	ANALYZE L4	UNDERSTAND L2



B. Tech. 5th Semester, [illegible]

Object Oriented Programming (PCC-CS503)

Full Marks : 25 **Time : 60 Min.**

Group – A

1×5=5

1. ***Fill in the blanks.***
   a) In case of the principles of object-oriented systems, one of the _____ elements is Hierarchy.
   b) In case of the principles of object-oriented systems, one of the _____ elements is Concurrency.
   c) In case of the principles of object-oriented systems, one of the _____ elements is Typing.

   Mark the following statements as either TRUE or FALSE.
   d) As per Grady Booch, the definition of Modularity is "Modularity is the property of a system that has been decomposed into a set of cohesive and tightly coupled modules."
   e) As per Grady Booch, the definition of Hierarchy is "Hierarchy is the ranking or ordering of abstraction".

Group - B

Attempt all questions.

2. With the help of a concrete example, demonstrate the significance of static methods in the context of execution of Java programs. 5
3. Explain the concept of Run-time Polymorphism in Java. 5
4. Write a simple program in Java to demonstrate the concept that one interface can extend another one. 5
5. Discuss the concept of checked & unchecked exceptions in Java with proper examples. 5