1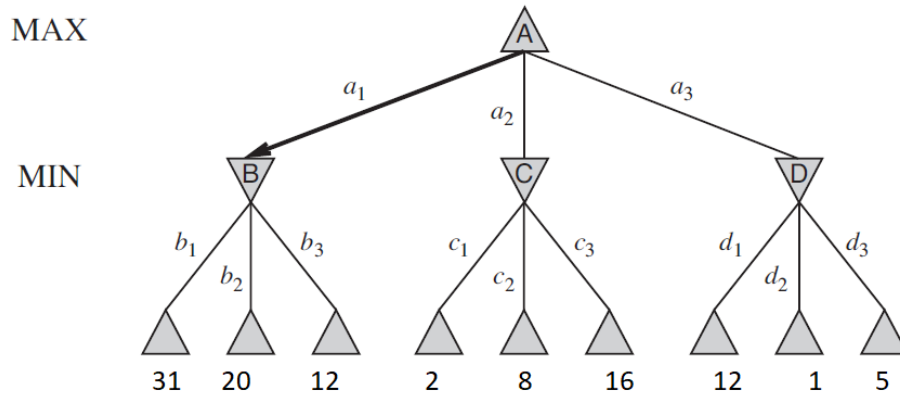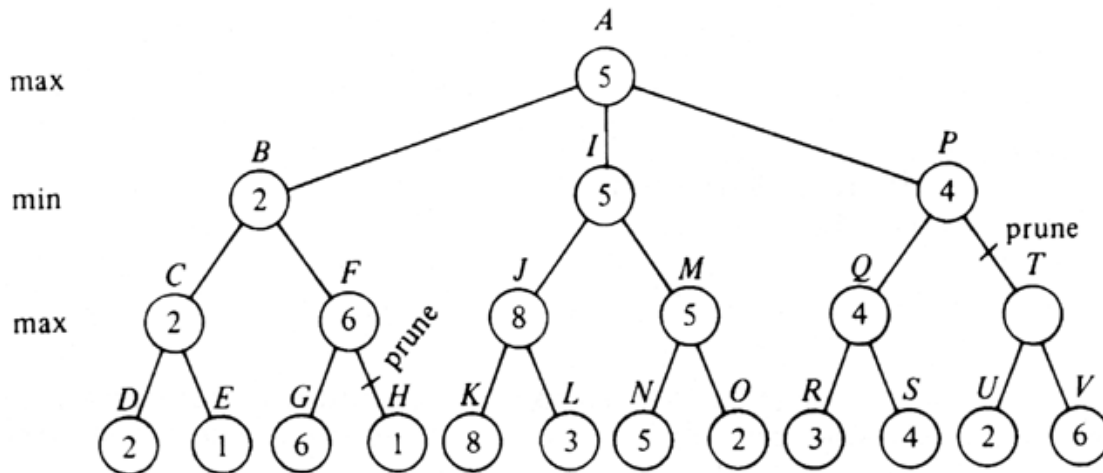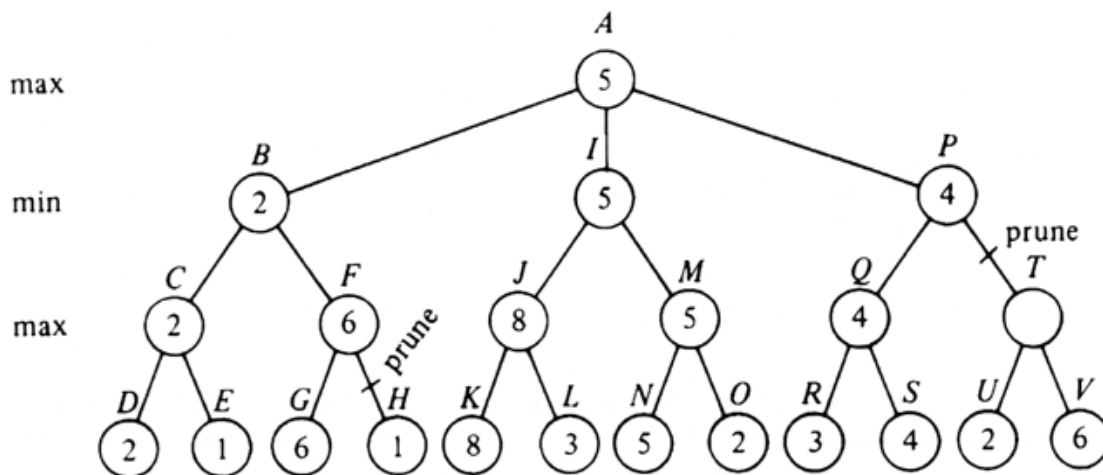. Calculate the minimax values at nodes A, B, C, and D for the player MAX given the game tree below. The numbers at the leaf nodes represent the values of Utility (leafnode, MAX).

MAX

a_1

a_2

a_3

MIN

B

C

D

b_1

b_2

b_3

c_1

c_2

c_3

d_1

d_2

d_3

31	20	12	2	8	16	12	1	5

2. In the following tree, apply the Alpha-beta pruning algorithm. Which of the following nodes will be pruned - T, U, V? Assume that the nodes are processed from left to right.

A

max

5

B

I

P

min

2

5

4

prune

T

C

F

J

M

Q

max

2

6

8

5

4

D

E

G

H

K

L

N

O

R

S

U

V

2

1

6

1

8

3

5

2

3

4

2

6

prune

3. What will be the values of "alpha" and "beta" at the nodes J, M, Q, and T after the Alpha-beta pruning is executed on the graph aside? Assume that the nodes are processed from left to right.

A

max

5

B

I

P

min

2

5

4

prune

T

C

F

J

M

Q

max

2

6

8

5

4

D

E

G

H

K

L

N

O

R

S

U

V

2

1

6

1

8

3

5

2

3

4

2

6

prune

4. For the following game tree, show which nodes/sub-tree will be pruned by the Alpha-Beta pruning algorithm. Assume that the nodes are processed from left to right.