密 封 线 内 不 要 答 题

**课程名称：** 系统工程

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**北京邮电大学自学考试**

**答 题 纸**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 题号 | 一 | 二 | 三 | 四 | 五 | 六 | 七 | 总分 |
| 得分 |  |  |  |  |  |  |  |  |

注意事项：1. 考生答题前，请在顶端方框内填写姓名和准考证号

2. 所有解题过程做在答题纸上，写清题号，按顺序作答

3. 答题纸不够用时，可下拉加页

4. 字号为四号、宋体

一、解：设甲产品为x千克，乙产品为y千克。

Max = 8x+13y

s.t 10x+5y370

5x+6y220

4x+11y330

x0

y0

二、解：

悲观准则

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | 50 | 30 | 10 |
|  | 20 | 25 | 10 |
|  | -20 | -10 | 10 |
| Min | -20 | -10 | 10 |

Max(-20,-10,10)=10,所以选择方案。

乐观准则

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | 50 | 30 | 10 |
|  | 20 | 25 | 10 |
|  | -20 | -10 | 10 |
| Max | 50 | 30 | 10 |

Max(50,30,10)=50,所以选择方案。

等可能性准则

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | 50 | 30 | 10 |
|  | 20 | 25 | 10 |
|  | -20 | -10 | 10 |
|  | 16.7 | 15 | 10 |

Max(16.7,15,10)=16.7,所以选择方案。

最小机会损失准则

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | 0 | 20 | 40 |
|  | 5 | 0 | 15 |
|  | 30 | 20 | 0 |
| Max | 30 | 20 | 40 |

min(30,20,40)=20,所以选择方案。

1. 解：

利用方根法：

第一个矩阵

W(B1) = )=0.87

W(B2) = =2.47

W(B3) = =0.46

归一化处理

WO(B1)=0.87/(0.87+2.47+0.46)=0.23

WO(B2)=2.47/(0.87+2.47+0.46)=0.65

WO(B3)=0.46/(0.87+2.47+0.46)=0.12

权重W=(0.23,0.65,0.12)

1 = (1)/0.23=2.99

2 = (3)/0.65=2.98

3 = (0.5)/0.12=3.04

max=3.04

CI = 0.02<0.1检验符合要求；

CR=0.02/0.52=0.038<0.1 不一致性程度在容许范围内；

第二个矩阵

W(C1) = =0.41

W(C2) = )=1

W(C3) = =2.47

归一化处理

WO(C1)=0.41/(0.41+1+2.47)=0.11

WO(C2)=1/(0.41+1+2.47)=0.25

WO(C3)=2.47/(0.41+1+2.47)=0.64

权重W=(0.11,0.25,0.64)

1 = (1)/0.11=2.92

2 = (3)/0.25=3.17

3 = (5)/0.64=3.03

max=3.17

CI = 0.085<0.1检验符合要求；

CR=0.085/0.52=0.16>0.1 不一致性程度不在容许范围内；

第三个矩阵

W(C1) = =2.41

W(C2) = =1.36

W(C3) = =0.31

归一化处理

WO(C1)=2.41/(2.41+1.36+0.31)=0.59

WO(C2)=1.36/(2.41+1.36+0.31)=0.33

WO(C3)=0.31/(2.41+1.36+0.31)=0.08

权重W=(0.59,0.33,0.08)

1 = (1)/0.59=3.07

2 = ()/0.33=3.11

3 = ()/0.08=2.89

max=3.11

CI = 0.055<0.1检验符合要求；

CR=0.055/0.52=0.11>0.1 不一致性程度不在容许范围内；

第四个矩阵

W(C1) = =0.75

W(C2) = =0.33

W(C3) = =3.98

归一化处理

WO(C1)=0.75/(0.75+0.33+3.98)=0.15

WO(C2)=0.33/(0.75+0.33+3.98)=0.07

WO(C3)=3.98/(0.75+0.33+3.98)=0.78

权重W=(0.15,0.07,0.78)

1 = (1)/0.15=3.14

2 = ()/0.07=2.95

3 = ()/0.78=3.15

max=3.15

CI = 0.075<0.1检验符合要求；

CR=0.075/0.52=0.14>0.1 不一致性程度不在容许范围内；

WD1=0.230.11+0.650.4268

WD2=0.230.2804

WD3=0.230.2978

所以是最好的方案。

四、解：

邻接矩阵

A =

A1 = + =

A2=A1A1 =

A3=A2A1=

A3=A2

可达矩阵R = A3

缩减可达矩阵= R

五、解：

方案1

CPV = 30+50/(1+10%)+20/ = 91.98

BPV = 80/+90/+100/+110/=245.76

NPV = BPV-CPV=153.78

方案二

CPV = 80+40/(1+10%)=116.36

BPV = 90/++90/+90/=259.35

NPV=BPV-CPV=142.99

方案三

CPV = 50+50/(1+10%)+50/

BPV = 100/+120/+120/+120/=299.34

NPV = BPV-CPV=162.56

通过计算可知方案三净现值162.56最大，所以应该选择方案三。

六、解：



计算期望值

E2=0

E3=-60000

E4=-600000

选择损失最小方案

搬走期望值E=-1800元

不搬走做好防护措施E=-1200-500=-1700元

不搬走不做防护措施E=-3700元

所以不搬走做好防护措施最为合算。

七、解

填写矩阵图可知：

利用方根法求解

W(B1) = =0.87

W(B2) = =2.47

W(B3) = =0.46

归一化处理

WO(B1)=0.87/(0.87+2.47+0.46)=0.23

WO(B2)=2.47/(0.87+2.47+0.46)=0.65

WO(B3)=0.46/(0.87+2.47+0.46)=0.12

权重W=(0.15,0.07,0.78)

1 = (1)/0.23=2.96

2 = ()/0.65=2.98

3 = ()/0.12=3.04

max=3.04

CI = 0.02<0.1检验符合要求；