**Econ 316**

Student’s Name

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**Question 1**

1. Given C(.) satisfies WARP

When C(.) meets WARP with the axiom of Houthaker, C(.) meets Sen's β and Ωconcrete according to which, C(.)=C (.,>) the preference relationship > is respected.

1. v, w, x is contained in C(B1,>)

Because C(B1) includes x. A preferred relationship exists between x, v, w. C(B1) comprises v and w.

1. (b) v, w, x, y, z is C(B,>), where > is preference and negatively transitive.

**Question 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Function of Utility | ∂U /∂x1 | ∂U /∂x2 | MRS (x1, x2) | MRS (2,3) |
| U (x1, x2) = x1x2 | x2 | x1 | − x2 /x1 | − 3/ 2 |
| U (x1, x2) = 3 ln x1 + 5 ln x2 | 3/ x1 | 5/ x2 | − 3x2/ 5x1 | − 9/ 10 |
| U (x1, x2) = x 3 1x 5 2 | 3x 2 1x 5 2 | 5x 3 1x 4 2 | − 3x2/ 5x1 | − 9/ 10 |

CDs,x2

DVDs, x1

**Question 3**

3a) f(x) = µ(x) +{µ (x)}7

df/dµ = 1+ 7 µ6

Hence, f is monotonic transformation of µ, therefore, f and µ exhibit same preferences.

3b) f(x) = µ(x) + { µ(x) }2

df/dµ = 1+ 2µ

Hence, f is monotonic transformation of µ, two shows same preferences

3c) f(x) = µ(x) +

df/dµ= 1>0

Hence, f and µ exhibit same set of preferences

**Question 4**

M(x) =X1αX21-α, P= (1, 1), W=64

Marshallian demand function

Given the budget constraints

X1+ X2= 64 …………………. (i)

dµ(x)/d X1=αX21-αX1α-1

= αX21-αX1-(1-α)

=α(X2/ X1)1-α

dµ/dx2= (1- α) x21-α-1X1α

= (1- α) (X2/ X1) α

At equilibrium

µx1/Px1= µx1/Px2

α(x2/ x1)1-α/1 = (1- α)(x1/ x2)α/1

α/1- α=(x1/ x2) α/(x1/ C)(x2/ x1)α =x1/ x2

x1= α/1- αx2……………………... (ii)

α/1- αx2+x2=64

α+(1­-α)/1-αx2 =64

x2=(1-α)64

x1=α/(1-α) \* (1-α)64

x1= α64

hence the Marshallian demand is

x1= α64 and

x2=(1-α)64

**Answer 4b**

When α=1/2 yields this values

x1=x2=1/2 (64) = 32

Therefore, the budget constraints at p(1,1)

1. 32+(1)32=64

x2

64

A

32 μ=32

0

32 64 x2

So, the new budget constraints will be

x1 + 2x2=64

x2= 64/3

x2=21.3

Substituting the value in equation (2)

x1=21

x2

64

21.3

21.3

0

21.3 64 x1

x2>10, p2=4 and t=3 per unit

the budget constraints is

p1x1+ p2x2=64

atx2=10

x1+ 1(10)=64

x1=54

atx2=11; x1+4(11)=64

x1=64-44

x1=20

atx1=12; x1+4(12)=64

x1+48=64

x1=64-48

x1=16

atx2=13; x1=64-(13)4

=12

At x2=14; x1=64-(14)4

=8

At x2=15; x1=64-(15)4

x1=4

at x1=16 x1=64-(16)4

x1=0

hence consumers can have maximum of

x2=16 and x1=64

**Answer 4d**

yes:Marshallian demand is obviously single valued because is already known the quantities of x1and x2demanded.

This means that knows the utility given the market priors of the goods.

**Question 5**

µ x = ( xp1 + 3/2 x p2) 1/p where p ≠ 0

**Answer (5a)**

marshallian demand fuction

µ (x)/ dx1 = 1/p. p { x1 + 3/2 x p2 } 1/p – 1

= ( x1 + 3/2 x p2 ) 1-p/p . p x 1 p-1

µ (x)/ dx2 = 3/2 p. 1/p (x p1 + 3/2 x p 2) 1- p/ p . px p-12

= 3p/2 x p-12 ( x p1 + 3/2 x2p) 1-p/p

Budget constraints

x1 p1 + x2p2 = w ……………………. 1

at equilibrium

µx/ px = µy/ py

(x1 + 3/2 x p2 ) 1- p/ p . p p-1x1 = 3/2 pp-12 ( x p1 + 3/2 x p2 ) 1-p/p

Px py

P x= 2/3 py ( x1/ x2 )p . x2 / x1 ………………………………. 2

Since

x1p1 + x2p2 = w

x1{2/3 p2 (x1/ x2 )p x2 / x1 } + x2 p2 = w

2/3p2 x2 ( x1/ x2) p + x2 p2 = w

P2 =3wx 1p

2x1 p + x2 p+1 …………………………………………… 3

Hence marshallan demand equation function

P1 = 3wx1p and

(2x1+ x2p ) x1

P2 = 3wx1p

2x1p + x2p+1

**Question 5b**

Indirect utility function

P2 = 3wx2 p

x2(2x1 p + x2p )

p2 {x2(2x1p + x2p)} = 3wx2p

2x1p = 3wx2p – x2p

x2p

x1= {1/2 (3wx2p – p2 x2p )}

p1= 2wx1p

(2x1p + x2p ) x1

x 2 = 2{wx1p – 2x1p p1 }1/7

p1

Hence indirect utility function

µ (x)= {(1/3(3wx2 p – p2x 2 p+1 )} + { 3/p1 (wx1p + 2x1pp1) } 1/p

**Question 5 c**

W= 24, p= (1,1) and p= 0.5

µ(x)= (x10.5 +3/2 x2 0.5 )2

p1/ p2 = 2/3(x1/ x2) 0.5

1/1 = 2/3 (x1 /x2)0.5

x1 = ( 2/3 x20.5 )1/ 0.5

x 1 = ( 2/3) 1/0.5 x2

budget constraints

p1 x1 + p2 x2 = w

x1 = 24-x2 = (2/3) 1/0.5 x2 + x2

24= x2 {1+ (2/3) 1/0.5

x2 = 24/1.444

x2= 16.16

x1= 24-16.16

x1 = 7.384

**question 5d**

p= -1. W= 24,p= (½,1)

½ = 2/3 (x2/ x1)

1

1/2= 2/3 (x1/ x2)

X 2 = 4/3 x 1

X 1(1+4/3) = 48

X 1 = 48(3/13)

X 1 = 11.076

X2 = 4/3 (11.076)

= 14.76

Therefore x1, x2 = (11, 15)

**Question 6**

α=(xp1+3/2 xp2)

expenditure, e =px1x1+px2x2

minimize :px1x1+px2x2

subject to (xp1+3/2 xp2)1/p

langragia function α=(objective function)+(constraints function)

α=px1x1+px2x2+λ[μx1p+3/2xp2)1/p

Չα/Չx1=px1+λ[-1/p(xp1+3/2 xp2)1-p/p

px1-λ[x1p-1(x1p+3/2 xp2)1-p/p] = 0

Չα/Չx1=px2+λ[-1/p(xp1+3/2 xp2)1-p/p(3/2p)xp2

px2-3/2λ(xp-12)(xp1+3/2xp2)1-p/p=pα2

αx1p-2(xp1+3/2xp2)1-p/p=px1/px2

3/2λp-12(xp1+3/2xp2)1-p/p

6b

2/3(x1/ x2)1-p = px1/px2

x2/ x2 = (3/2- px1/ px2)1/1-p

x2 = (3/2 x px1/px2) 1/1-p α1

utility function

µ= x1p + 3/2 x2p) 1/p

µ= x1p + 3/2{(3/2-px1/ px2)1/1-p x2p} 1/p

µ= x1{1+3/2 p x1/px2) p/1-p}p

therefore, hickson demand function is

x1h = µ/{1+3/2(3/2 px1/px2) p/1-p }1/p

x2h = (3/2 px1/px2) 1/1-p µ

{1+3/2(3/2 . px1/px2) p/1-p}1/p

**Question 6 c**

Putting value of hickgian demand in expenditure equestion

e= px1 x1 h + px1 x 2 h

e= px1 µ + px2 (3/2 px1/p x2) 1/1-p µ

{1+3/2(3/2 p x1/p x2)p/1-p } 1p

Question 6 d

Expenditure fuction (e) is homogeneous of degree 1 in place

Proof

e( ƛpx1 , ƛpxe , µ)

= ƛpx1 + ƛpx2 ( 3/2ƛpx1/ ƛpx2 ) p/1-p µ

{1+3/2(ƛpx1/ ƛpx2)p/1- ƛ } ½

ƛe(px1, px2, µ)

Therefore, expenditure fuction is homogeneous degree 1, hence proved.

**Question 7**

Results from 5a,

P1=2wx1p/(2x1+x2p)x1and

P2=3wx1p

Deriving the hicksian demand function using the slutsky equation written as

1. Չμ(x)/Չpx=Չμh/Չpx-x1Չμ/Չi=cross price effect
2. Չμ/Չpx2=Չμh/Չpx2-x2Չμ/Չi=own orice effect

Lets verify

L.T.S

Չp/ՉpX1=2PWX1/(ՉX1)=2PW/2X1+x2p

R.H.S

2p/dp2α=3wxp1/2xp1+xp+12

=3pwx1/2px1+xp2

L.H.S = R.H.S, hence, proved.