A.1 **(a)** Completeness, transitivity and more is better than less.
Completeness – Preferences are assumed to be complete. Consumers can compare and bank all possible baskets. A consumer might prefer steak to hamburgers, but hamburgers are cheaper.

Transitivity – means that if a consumer prefers basket A to basket B and basket B to basket C, then the consumer also prefers A to C. e.g. Porsche is preferred to Cadillac and a Cadillac to Chevrolet, then a Porsche is also preferred to Chevrolet. Normally regarded as necessary for consumer consistency.

More is better than less – goods are assumed to be desirable, i.e. to be good. Consumers always prefer more of any good to less. In addition, consumers are never satisfied or satiated: more is always better, even if just a little better.

A.1 **(b)** The consumer is initially at X on the budget line RS. With a decrease in the price of rice, the consumer moves to Y. The resulting change in rice purchased can be broken down into a substitution effect, AC (associated with a move from Z to Y). In this case, rice is an inferior good because the income effect is negative. Because the substitution effect exceeds the income effect, the decrease in the price of rice leads to an increase in the quantity of rice demanded.

A.1 **(c)** When food is an inferior good, and when the income effect is large enough to dominate the substitution effect, the demand curve will be upward-sloping. The consumer is initially at Point X, but after the price of potatoes decreases, moves to Y and consumes less food. Because the income effect CA is larger than the substitution effect BC the decrease in the price of potatoes leads to a lower quantity of potatoes demanded.

A.2 **(a)** Marginal rate of technical substitution is the amount by which the quantity of one input can be reduced when one extra unit of another input is used so that input remains constant. In terms of cows and land, as more cows are added to the production process, the resulting effect would be a reduction of land in the production process.

A.1 **(b)** MRTS = Change in land / Change in cows input

Additional input from increased use of cows = $(MP_C)(\Delta C)$
Reduction output from decreased use of land = $(MP_L)(\Delta L)$

(MPc) (ΔC) + (MPL) (ΔL) = O
Now by rearranging terms we see that
(MPc) / (MPL) = ō (ΔL) / (ΔC) = MRTS

A.1 **(c)** Minimise C = wL + rK
The total cost of producing any particular output is given by the sum of the firm's labour cost wL and it's capital, rK.

A.1 **(d)** Ac = wL + rK
= 5000 (10) + 1000 (20)
= 50 000 + 20 000
= 70 000

Bc = wL + rK
= 5000 (14) + 1000 (70)
= 70 000 + 70 000
= 140 000

Cc = wL + rK
= 5000 (14) + 1000 (70)
= 70 000 + 70 000
= 140 000

Dc = wL + rK
= 5000 (34) + 1000 (170)
= 170 000 + 170 000
= 340 000

Points A and B illustrate the lowest-cost combination of labour and capital that can be used to produce each level of output. Points C and D measure the least cost of producing each level of output.

B.1 **(a)** Pareto Efficiency is the efficient allocation of goods in which no one can be made better off unless someone else is made worse off. If the labour and capital markets are perfectly competitive, then the wage rate (w) will be the same in all industries. Likewise, the rental of capital (r) will be the same whether capital is used in the production of cars or computers.

B.1 **(b)** Contract Curve

A & B

Point P represents the point where production is inefficient, while Point D represents an efficient allocation. A movement from A to D is as a result of bargaining between two industries. The computer industry would benefit from the movement from point A to D, as their position has changed from inefficient production to a more efficient production point.

The Computer Industry.

B.2 Total Revenue ➢ $R_1 = PQ_1 = (20 - Q)(Q_1)$

$20Q_1 - (Q_1 + Q_2)Q_1$

$20Q_1 - Q^2_1 - Q_2Q_1$

Marginal Revenue ➢ $MR_1 = \Delta R_1 / \Delta Q_1$

$20 - 2Q_1 - Q_2$

Firm 1: reaction curve: $Q_1 = 10 - \frac{1}{2}Q_2$

$Q_1 = 10 - \frac{1}{2}(1Q - \frac{1}{2}Q_1)$

$Q_1 = 10 - 10/2 + \frac{1}{4}Q_1$

$Q_1 - \frac{1}{4}Q_1 = 5$

$\frac{3}{4}Q_1 = 5$

$Q_1 = 6\frac{2}{3}$

Firm 2's reaction curve: $Q2 = 10 - \frac{1}{2}Q1$

$6\frac{2}{3}$ (same as Firm 1's)

Output Equilibrium – $Q1 = Q2 = 6\frac{2}{3}$

Total Quantity produced is therefore $Q = Q1 + Q2$

$6\frac{2}{3} + 6\frac{2}{3}$

$20/3 + 20/3$

$40/3$

$13\frac{1}{3}$

$P = 20_1 - Q$

$P = 20 - 13\frac{1}{3} = 6\frac{2}{3} = K\ 6.66$

Te $= Q1*P$

$= 6\frac{2}{3} \times 6\frac{2}{3}$

$= 20/3 \times 20/3$

$= 400/9$

= R 44.44 profit earned.