**AGRICULTURAL ECONOMICS III**

**(PRODUCTION ECONOMICS)**

1. four ways of increasing labour efficiency on the farm

* Training them
* Giving incentives
* Supervision
* Good operator – worker relationship
* Farm mechanization
* Assigning tasks according to skills & specialization
* Proper remuneration : Attractive salaries

2. a) graph representing the total egg production per week.

b) - Increasing returns production function.

3. (a) - Help to determine the value of the farm/ determine assets and liabilities.

- Provide history of the farm.

- Assist in planning and budgeting in various fields.

- Helps to detect losses or theft in the farm.

- Assists when sharing losses or profits (dividends)for communal owned farms/ partnership.

- Help to settle disputes in the farm among heirs.

- Help to support insurance claim e.g. against fire and theft.

- Provide labour information like terminal benefits, NSSF due, Sacco dues for all employees.

- Help to compare the performance of different enterprises within a farm or other farms.

- Help in the assessment of income tax to avoid over or under taxation.

- Records, helps to show whether the farm business is making profit or losses. This information

helps in obtaining credit. (10 x 1 = 10 mks)

(b) - Training worker e.g. in F.T.C’s, during field days, Agricultural shows, through

demonstrations and workshops.

* Measuring farm operations to supplement the labour force.
* Providing incentives to workers such as attractive wages, free protective wear, housing, medical facilities, proper feeding, rewarding good workers. Et.c
* Supervising and counseling workers.
* Creating good operator - worker relationships.
* Assigning specific tasks to the labor force.

(c) - Establishment of land ownership.

- Measurement of land size.

- Description of the land.

- Recording and mapping of the surveyed land.

- Solving objections if any.

- Submission of the maps and records to the district land office registration

4. Three types of agricultural services available to the farmer

* Credit
* Extension and training
* Agricultural research
* Banking
* Artificial insemination

- Veterinary

5. Four management guideline questions which assist a farm manager in making accurate

farm decisions

* What product to produce?
* How much to produce?
* What to produce?

- For whom to produce?

6. - Training

* Farm mechanization
* Labor supervision
* Giving incentives and improving terms and conditions of service

Assign specific tasks

7. - Fertilizers - Seeds

* Pesticides -Casual labor

8. - Banking

* Extension and training
* Credit facility
* Agricultural research
* Marketing
* Farm input supplies

Tractor hire service

9. (a) Is the sum total of goods and services produced by a country within a period of one year (b) -Per capital income: Is the gross national income divided by the number of people living

in a country

10. -Diversification- Setting up several and different enterprises on the farm. If one fails the

farmer cannot incur total loss.

* Contracting- farmers can enter into contract with consumers. It guarantees a constant fixed market for goods/services
* Insurance- Taking an insurance cover to compensate them incase of loss
* Input rationing- Farmers can control the quantities of inputs used in various enterprises to reduce losses
* Flexibility in production methods- Ability to change from one enterprise to another in response to demand changes
* Adopting modern methods of production e.g. disease control, irrigation, mechanization e.t.c.

11. Application of fertilizer

|  |  |  |  |
| --- | --- | --- | --- |
| Input 50kg bag fertilizer | Out put 90kg bag maize | Average product (AP) | Marginal product (MP) |
| 0  1  2  3  4  5  6  7  8 | 6  10  24  31  36  40  43  43  40 | -  10  12  10.33  9  8  7.18  6.14  5 | 0  4  14  7  5  4  3  0  -3 |

(ii) The best level of production in relation to the inputs and out put is level 3

(b) (i) Gross margins for the crops

(i) Maize

|  |  |
| --- | --- |
| Value of maize/incomve | 5,500 x 15 = 82,500/= (1mk) |
| Cost of labour | 50x 150 = 7,500/= (1mk) |
| Cost of cultivation /ha | 1 x 3,000 = 3,000/= (1mk) |
| Cost of seed | 25 x 100 = 2,500/= (1mk) |
| Cost of DAP fertilizer | 3 x 1,500 = 4,500/= (1mk) |
| Cost of C.AN fertilizer | 3 x 1000 = 3,000/= (1mk) |
| Total variable costs | 20,500/= (1mk) |
| GM for maize | 82,500 – 20,500 = 62,000 (1mk) |

(ii) Beans

|  |  |
| --- | --- |
| Value of beans/income | 5,000 x 500 = 250,000/= (1mk) |
| Cost of labour | 75 x 200 = 15,000/= (1mk) |
| Cost of cultivation /ha | 1 x 3,600 = 3,600/= (1mk) |
| Cost of seed | 20 x 80 = 1,600/= (1mk) |
| Cost of DAP fertilizer | 2 x 1,500 = 3,000/= (1mk) |
| Cost of C.AN fertilizer | 1 x 1000 = 1,000/= (1mk) |
| Total variable costs | 27,200/= (1mk) |
| GM for beans | 250,000 – 27,200 = 222,800 (1mk) |

(b) (ii) The crop which is profitable from the calculation is that : (1mk)

* It is more profitable to grow beans than maize

12. a) ZONE I

- For each additional unit of input applied the output of maize increased at an increasing

rate because the fertilizer resources are underutilized √1 (1x2=2 mks)

ZONE II

- For each additional unit of input applied the output of maize increased at a decreasing

rate because the resources are used to the maximum√1 (1x2=2 mks)

ZONE III

- For each additional unit of input applied the output of maize decreases because

the fertilizer/ resources are excessively applied√1 (1x2=2 mks)

b) ZONE II

13. Give four variable costs in maize production

* Cost of fertilizer
* Cost of seeds
* Cost of pesticide
* Cost of weeding
* Cost of harvesting
* Cost of casual labour
* Cost of fuel

14.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | QUANTITY | NO. OF UNITS | COST PER UNIT | TOTAL VARIABLES  COST |
| Weeding  Seeds  Irrigation  Ploughing  Clearing land  Planting  Harvesting  DAP fertilizer  DAN fertilizer  Gunning bags  transport | -  20kg  -  -  -  -  -  2bags  2bags  32  - | -  2  2ha  2ha  -  2ha  2ha  2  2  32  - | -  300  600  500  -  400  1 200  10 000  700  40  - | 800 00  600 00  1200 00  1000 00  1200 00  800 00  2400 00  20 000 00  1400 00  1280 00  2000 00 |
| Total variable cost |  |  |  | 32 680 00 |
| income | | 32bags | 1200 | 38 400 00 |

Gross margin=total revenue-total variable cost

= 38400-32680 = 5720.00

15.

* Profit maximization is the profit in a production process where the highest net returns (Net revenue) on invested capital is realized/ when the difference between total revenue (TR) and total cost (TC) is the highest point in a production process/ where profit is highest
* Is where marginal revenue (MR) is equal to or almost equal to marginal costs

16. a) i) Gross margins for the crops

|  |  |  |
| --- | --- | --- |
| Value of maize/ income | 55000 X 15 = 82500 | 1 mark |
| Cost of labour | 50 X 150 = 7500 | 1 mark |
| Cost of cultivation/ ha | 1 X 3000 = 3000 | 1 mark |
| Cost of seed | 25 X 100 = 2500 | 1 mark |
| Cost of DAP fertilizer | 3 X 1500 = 4500 | 1 mark |
| Cost of CAN fertilizer | 3 X 1000 = 3000 | 1 mark |
| Total variable costs | 20500 | 1 mark |
| GM for maize | 82500- 20500 = 62000 | 1 mark |

ii) Beans

|  |  |  |
| --- | --- | --- |
| Value of beans/ income | 5000 X 500 = 250000 | 1 mark |
| Cost of labour | 75 X 200 = 15000 | 1 mark |
| Cost of cultivation/ ha | 1 X 3600 = 3600 | 1 mark |
| Cost of seed | 20 X 80 = 1600 | 1 mark |
| Cost of DAP fertilizer | 2 X 1500 = 3000 | 1 mark |
| Cost of CAN fertilizer | 1 X 1000 = 1000 | 1 mark |
| Cost of sprays | 3000 | 1 mark |
| Total variable costs | 27200 | 1 mark |
| GM for beans | 250000 – 27200 = 222800 | 1 mark |

iii) It is more profitable to grow beans than maize 1 mark

b)

* Size of the farm
* Climatic conditions
* Fairness objectives and preferences
* Existing market conditions
* Available resources
* Expected returns

17. - The farmer should grow groundnuts;

- The crop has a higher gross margin than cotton;

18. – The farmer may be able to estimate the required production resource e.g labour capital e.t.c

- Assists farmer when e.g. labour capital etc

- Assists farmer in making management decisions;

- Helps to reduce uncertainties in the production process;

- Shows progress or lock of progress in farm business;

19. (a) (i) See the graph paper

(ii) 56 bags; (1x1=1mk)

(b) Table – ( 16x ½ =8mks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Fertilizer applied (bags) | Maize output (bgs) | Marginal product | Average product |
| 1995  1996  1997  1998  1999  2000  2001  202  2003 | 0  2  4  6  8  10  12  14  16 | 4  10  28  42  52  60  66  66  64 | -  6  18  14  10  8  6  0  -2 | -  5  7  7  6.5  6  5.5  4.7  4 |

(c) (i) 4 bags (1x1=1mk)

(ii) MP is maximum; AP is maximum; (2x1=2mks)

(d) Gross income = Total output x price per unit

in 2002 66 x 1000 = 66000/= (1x1=1mk

in 2003: 64 x 1000 = 64000/= (1x1=1mk)

(ii) Net income = Total income – Total cost

in 1999: Total income was 52 x 1000 = 52000/=

total cost was 8 x 1200 = 9,600/=

Hence 5200/= - 9600; (1mk)

= Shs. 42,400/= (1mk)

21.

* Flood costs (F.C)
* Variable costs (V.C)
* Total costs (T.C)
* Average costs (A.C)
* Marginal costs (M.C)

22.

* Co-operative societies
* Crop boards
* Commercial banks
* Agricultural finance corporation (A.F.C)
* Settlement fund trustees
* Hire purchase companies
* Insurance companies. (Any 4 )

23. three ways in which labour peaks can be overcome in the farm

* Overtime working for casual labourers
* Greater use of casual workers
* Mechanization
* Use of contractors who may be engaged to do some work at a fee
* Cropping system devised such that ripening of crops could be at different times

Work study to devise new techniques of doing work more quickly and efficient

24 . - training

-giving incentives/motivation

-farm mechanization

-labour

25. (a) 1000kg of NAP con 46kg P2O5S

150 x 100 – 150

50

300kg of DAP per hectar

1ha = 300kg of DAP

5ha x 300

1 = 1500g of DAP

1 bag = 50kg

1500 x 1 = 1500kg

50 = 30bags pf DAP

N/B Approximation = 3obags

CAN

100kg contain 20kg of price N

200x 100 = 200kg

30 = 1000kg

I ha = 1000kg

5ha = 1000 x 5 = 5000kg

1bag = 50kg

5000 x 1 = 5000kg

50

= 100bags of CAN

(b) (i) – cross margin is variable cost – total revenue

Gross margin of irish potatoes

Cost of fert = shs 10000 x 5 = 50000

Cost labour requirement = 50 x 200 x 5 = 50,000

Cost of seed potatoes 20,000 x 5 = 100000

Cost of fungicides 5000 x 5 = 25000

Cost of ploughing 400 x 5 = 50,000

Total variable cost shs.145,000

Total revenue = shs.50,000 x 50 = shs.1,500,00

Gross margin shs. 1,500,000 – shs.145,000 =shs.1,255,100

(i) Maize

Cost of fert. shs 10000 x 5 = shs.50000

Cost of fert. shs. 4800 x 5 = shs.24000

Cost of maize seed shs.3000 x 5 = shs.15000

Cost f labour shs.200 x 150x 5 = shs.150000

Cost of ploughing shs.4000 x 5 = shs.20000

Total cost = shs.259000

Revenue 750000 X 5 X 20= Shs.750000

Gross margin = 750000

- 259000

Shs.481000

(ii)He should grow potatoes

- pests

Diseases

Unreliable rainfall

Change in temperature

Strong wind

Light aspect

Infertile soils