ECOLOGY MARKING SCHEME

1. 1989 Q4 P1

May kill soil micro-organisms that decompose humus to release mineral salts. In this way they interfere with nutrient cycling

2. 1989 Q8 P1

Disease	**Causative agent**
Ringworm	Fungus
Tuberculosis	Bacteria
Yellow fever	Virus
Bilharzia	Schistosoma/fluke/platyhelmintes
Trypanosomiasis(sleeping sickness)	Trypanosoma

3. 1989 Q15 P1

- Drought or fire
- Emigration
- Food shortage/overgrazing

4. 1989 Q17 P1

(a) **-** The fish were caught, their age determined and the two year old were obtained
and their lengths measured and recorded.
- This was done repeatedly until a large enough number (more than thirty) were
measured. Calculation was done by dividing the total length of all fish by the total
number of fish.

(b) **-** Lake A has hard water/ more calcium while Lake D has soft water/ less calcium.
Calcium is needed for bone formation. Thus the fish in Lake A will grow faster
and have greater bone length and body length than fish in Lake D.

(c) Lakes C and D have very little / no calcium which is necessary for the formation of shell in snails.

(d) i) Light, temperature, carbon dioxide concentration, oxygen concentration, PH,
and salinity.

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ii) - Light: Determine the rate of photosynthesis hence the primary production of the lake

-Temperature: rate of enzyme action in photosynthesis and other Metabolic reactions in plants and animals

- Carbon dioxide: determine the rate of photosynthesis / productivity (since it is a raw material).it also determines the ph of water.

- Oxygen: affects respiration in plants and animals
- Salinity: some ions are needed for plants and animal nutrion. Osmoregulation in plants and animals is affected by salinity.

- Ph: Affects enzyme reactions in metabolism.

5. 1990 Q6 P1

Measles, chickenpox, herpes simplex, poliomyelitis

6. 1990 Q14 P1

(a)(i) 1968

(i) Hot water/ temperature, sewage and industrial waste

(ii) Temperature:

High temperature reduces the amount of dissolved oxygen in water. This cause the suffocation of fish.

Sewage:

- Decomposition of organic matter in sewage reduces oxygen concentration in the lake. Sewage provide food for bacteria (aerobic) increasing their population and demand for oxygen; leading to depriving fish for oxygen.
- The carbon dioxide and ammonia produced by decomposition of sewage changes PH of water in lake and hence interferes with photosynthesis.
- Pathogenic bacteria in sewage may kill fish.

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- Sewage blocks light penetration into the the lake. This interferes with producers / photosynthesis thus decreasing available.

Industrial waste:

Toxic substances in industrial waste kill producers and fish substance in wastes may clog fish gills and may change PH of water and oxygen solubility is reduced; oil in surface may reduced oxygen availability to fish.

(b) (i) population of species A recovers at a faster rate than species D

(ii) - Reproductive rate/ fecundity higher in A and B
- Less competition for food in A in absence of C.
- C feeds on A: therefore A increased faster in absence of C.
- More predation of D than A
- Waste contained toxic substances with longer terms effect in D than A

(c) (i) Capture/ Recapture method

(ii) Marks may have disappear/death may interefere

7. 1991 Q7 P1

- Generate oxygen
- Remove carbon dioxide

8. 1991 Q8 P1

- Vaccination/ Immunization;
- Proper hygiene

Acc. Any example of proper hygiene.

9. 1991 Q10 P1

(a) - Reduced leaf surface/ needle like / spine / scales; thickened / waxy / shiny cuticles; Sunken stomata; reduced number of stomata; hairy leaves.
- Succulent / fleshy leaves to store water.

(b) – Wave length / colour / quality of light.
- Duration / period of light
- Light intensity

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10. 1992 Q3 P1

Cholera/ dysentery/ typhoid/ hepatitis; clean sanitary conditions/ personal hygiene/ drinking boiled water / cook food well.

11. 1993 Q3 P1

Oil cuts the supply of air / suffocates / kills mosquito larvae: Thus breaking the life cycle / reducing population of mosquito

12. 1993 Q8 P1

(a) Elephantiasis / Filariasis
(b) Potato/ tomato blight

13. 1993 Q15 P1

(a) X

(i) Thick / waxy (and impervious) to prevent water loss.
(ii) Transparent to allow light; tough for protection against mechanical injury / infection; shiny to reflect heat / light preventing leaf from heating up.

Y

(i) Cell closely packed/ vertically elongates to trap light
(ii) Positioned on upper side trap light; has chloroplast for photosynthesis

(c) Large air space/ closely packed mesophyll tissue/ aerenchyme stomata on upper epidermis/ no stomata on lower epidermis; reduced muscular bundles; presence of scheroids; reduced/ thin cuticle; chloroplast on epidermis
Acc. Stomata on top/upper side or surface but Rej. Upper part
Acc. poorly developed vascular bundles
Rej. Reduced number of vascular bundles

14. 1993 Q19 P1

(a) A lot of food cause population to increase due high rate of reproduction an immigration hence competition for food, death, emigration thus reducing the population, little food leads to stiff competition, hence emigration, death reducing population.
(b) Energy from the sun is trapped by green plants, in the process of photosynthesis when chemical energy/ starch/ food is produced; the green plants are the producer/ are the 1st trophic level ; the plants are eaten by herbivore, which are primary consumers/ occupy the 2nd trophic level; the herbivores are then

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eaten by carnivores which are the secondary consumers/ the 3rd trophic level when the plants and animqls / organism die; saprophytic organisms/fungi/bacteria feds them into simple substance/ mineral, the fungi/ bacteria are the decomposers / dentritivores/ dentritors as the energy flows to various trophic levels some energy is lost through respiration.

15. 1994 Q5 P1

Energy to sustain primary consumers is obtained from primary producers(who must also sustain themselves).Energy lost from one trophic level to the next

16. 1994 Q19 P1

(a) Pollution in any process which leads to adverse/ harmful spoiling changes in the environment

(b) (i) Air

Air pollution is caused by pollutants such as dust, smoke, and fumes of engines, harmful gases / aerosols / sulphur dioxide / oxides of nitrogen / CO_2 / CO noise / loud explosion / bomb explosion

Sources

Factories/industries heavy traffic/ motor vehicles/ plains/ fire/ burning charcoal.

Volcanoes bomb explosion.

Control of air pollution

- Use of lead free petrol in motor vehicles
- Smokeless fuel/ electricity / solar energy
- Filtration of waste gases to remove harmful gases
- Factories to be elected away from residential area
- Reduced volume/ intensity of sound/ use ear miffs

(ii)Water

- Causes of water water pollution
- Agrochemical/silting/ dust/excessive fertilizers/ pesticides/ herbicides
- Industrial/ domestic waste/ efficient
- Untreated sewage/human feaces
- Sillage of oils/ chemicals

Control of water pollution

- Treatment of industrial wastes before discharge in water

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- Educating farmers on use of controlled amounts of insects/ pesticides/ herbicides/ weed killers/ fertilizerts / orgarnic farming controlled soil erosion
- Avoid spillage of oils/ chemicals

17. 1995 Q13 P1

(a) - Green plants – Grasshoppers – Lizards – snakes
- Green plants – Grasshoppers – Lizards – Cats
- Green plants – Mice – Snakes – Hawkers
- Green plants – Mice – Snakes – cats

(b) – Mice

(c) Lizards eat Hawk snakes, Rej. If any primary, tertiary consumer is given

(d) (i) Most plants will die / dry

(ii) (same) organisms may starve to death

(iii) (same) organisms may migrate

18. 1996 Q15 P1

(a) $\frac{374 \times 400}{80}$

(b) - There was even distribution of crabs
- No movement in and out of regions; no migration
- There was random distribution of errors after the first capture.

(c) – Capture/ recapture; capture release recapture.

19. 1996 Q20 P1

(a) 10 HRC and 31 HRC

(b) (i) A and B

The numbers of bacteria dividing are few: bacteria are adjusting conditions: few are dying therefore high increase in population

(ii) B and C

More cells are dividing due to suitable environment/ favorable conditions; few are dying; therefore high increase in population

(iii) C and D

No population change; number produced is equal to number dying.

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(c) Accumulation of toxic wastes; that kills bacteria; depletion of nutrients
leading to competition of space.

(d) (i) The population will remain the same
(ii) Temperature not conclusive for division
(e) – Food to be sufficient for population
- Social amenities/ education; health services

20. 1997 Q6 P1

(a) Mosquito larvae/ Pupae are killed; Accept suffocation/ Breaking life cycle of mosquitoes

(b) Pollution of environment/ oil expensive, other aquatic are killed; accept Contamination.

21. 1997 Q11 P1

(a) Grass→ Grasshoppers → Guinea fowls
Grass→ Termites → Guinea fowls

(b) Lions would compete with leopards
Gazelle numbers would reduce
Grass would increase

(c) Grass; rej. Plants

22. 1997 Q14 P1

(a) E- Denitrifying bacteria; e.g. pseudomonas denitrifications
J- Nitrifying bacteria; Nitrobacteria reject nitrosamines

(b) H- Death decay/ decomposition; excretion/ Aminonification putrefaction egestion.
F- Nitrogen fixation

(c) Plants

23. 1997 Q19 P1

(a) An association between two organisms; where one benefits; and the other is adversely affected. Or an association where an organism lives in or on another living or organism: obtaining from it and causing harm without necessary killing it.

(b) Has hooks/suckers: for attachment to wall of intestines: long; to increase surface area for absorption of food: award increase in S.A for absorption once. Secretes enzymes/to neutralize digestive enzymes; (mucus inhibitor substance/anti enzymes)

Hermaphroditic: to ensure reproductive/ self fertilization.

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Production of many eggs: to ensure survival

Segment for egg dispersal:

More than one host; for transmission: e.g T solium – pig (Intermediate host) T. Saginata. Long to fit in the intestine/ increase surface area for (flatten) Absorption of food; Anaerobic survive in the gut with low O_2.

24. 1998 Q5 P1

Symbiotic/ both benefit/ mutual benefit; correct description of mutual benefit

25. 1998 Q10 P1

–Light intensity decreases with depth light limiting
- Temperature decreases with depth

26. 1998 Q15 P1

(a) (i) Species A;

(ii) The rate of multiplication/ growth in A is faster than of species B

(b) (i) One year and three years

1-3 years shortage of resources more suitable environmental

Conditions/ such as food space e.t.c resource were not limiting hence the population increased exponentially rapidly; acc correctly named resource e.g food space.

(ii) Three years and seven years

3-7 years shortage of resources/ limiting/ birth rate equals death rate; hence the

population had become stagnant/ constant; acc;

Environmental resistance has set in rej. Incorrect resources e.g PT and T.

(c) Species A would decrease (because of there is less competition with species A/ More resources available.

27. 1999 Q13 P1

a) A community consists of all members of a given spaces ina particular habitat at a particular time.

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b) Use the capture and recapture methods; Catch the grasshoppers count and mark using permanent ink; record and release; and allow time 1 to 2 hours; recapture and count the marked and the unmarked; total population is equal to the number of marked and unmarked grasshoppers in the second sample multiplied by number marked grasshoppers in the first sample; divided by the number of grasshoppers marked in the second sample that were recaptured.

28. 1999 Q17 P1

Sulphur based chemicals e.g. sulphure dioxide gas H_2S Cl_2 HCl_2 produced by (food preventing) industries /sewages matter, Affect gaseous exchange/makes acid rain /damages plants leaves.

Acc. Pesticides, Herbicides, Insecticides, Acaricides, paint sprays, Aerosols

CFCs sprayed to control (plant) disease and pests, also affect respiratory organs of animals; the chemicals are residuals and persistent (not easily) broken down deplete.

Ozone layers; smoke/fumes produced in areas with (heavy) industries and (high density of motor vehicles / fire which burn fuel/oils wood coal; These visibility; fumes also settle on leaves and stop photosynthesis (excessive) production of carbon dioxide causes the green house effect/Temp. inversion as a result of heating in lower layers of atmosphere; sound /noise produced incessantly b machines/ heavy vehicles/aircraft; affects hearing in animals; Dust, industrial production of (cement) generates dust; which finally settles on plants leaves limiting photosynthesis; removal of vegetation/cutting of trees; interferes with.

The carbon cycle; radioactive emissions; from nuclear reactors/mines/ x-rays machines bombs cause mutation/cancer/death.

29. 2000 Q2 P1

Due to stiff competition of resources leading to elimination/ exclusion of one
species; acc. currently named example food

30. 2000 Q10 P1

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- Curved/ sharp/ hooked strong beaks for killing / tearing/ ripping off flesh from
bones
- Curved/ strong/ sharp claws for grabbing/ holding prey

31. 2000 Q14 P1

(a) Crop
Potatoes / tomato
Disease
Tomato/potato bright/ Acc. Tomato rot

(b) Use of fungicides
Eradication of infected crop/ uprooting/ burning of infected plants
Use biological control
Use of disease resistant varieties
Crop rotating

32. 2000 Q17 P1

(a) (i) Goat
(ii) It is a grazer and a browser
(b) Insufficient grass in bush/ aren't adapted to eating twigs/ not browsers/ are grazers

(c) (i) Domestic animals - total counts
Wild animals – total counts; aerial counts/ quadrant/ Belt transect/ capture/ recapture
(ii) Analyzing gut counts, studying dentition/ breaks/ claws/ parts
(d) Observation
Examine droppings
Dissecting a sample of animals/ study structure/ nature of digestive
System/ size of caecum/ length of intestine/ chamber
(e) Irrigation
Competition; diseases
Predation; human activity/ man accept any correct
Parasitism

(f) Poaching, cropping/ culling/ licensed spot hunting
(g) Pollution; translocation
Burning trees, charcoal- deforestation

33. 2000 Q19 P1

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Broad/ wide/ flat lamina provides large surface area for absorption of (O) and sunlight, thin to ensure short distance of CO_2 reach photosynthesis/ palisade cells; presence of stomata guard cells for efficient diffusion of O_2 gaseous exchange / H_2O vapour transpiration/ CO_2 into the leaf transparent cuticle epidermal cells; for light penetration into palisade cell which contains chloroplast next to upper epidermis; these receives maximum light for photosynthesis. Chloroplasts have chlorophyll, which traps light energy.
Leaves have vein, xylem and phloem to transport products of photosynthesis to other part of the plant.

Air spaces on spongy mesopyll, easily circulates gases/ CO_2 diffuse into palisade cells.

Mosaic arrangements of leaves; enable leaves to trap sunlight.

34. 2001 Q2 P1

Utilize energy from the sun to manufacture food/ photosynthesis; for subsequent tropic level/ consumers/ other organisms

35. 2001 Q13 P1

(a) A – Nitrogen fixation
D – Absorption

(b) Nitrate/ nitrates/ NO_2

(c) Denitrifying bacteria/ Denitrifiers

(d) (i) Leguminous plants, (acc. Legume/ acc examples e.g beans peas)

(ii) Roots nodules; rej root or nodules alone; acc; root

(e) – Killing / reducing of composers
- Killing/reduction of nitrogen fixing bacteria/ nitrogen fixing microorganisms
- Destruction of leguminous plants

36. 2002 Q2 P1

a) Rhizobium Nitrogen fixing bacteria

b) Symbiosis / mutualism

37. 2002 Q7 P1

Cattle are mainly grazers while others are browser.

38. 2002 Q12 P1

a) A A photosynthesis
B Decomposition / decay

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C Respiration

b) X Bacterial
Y Fungi
c) Regulate the CO2 in the atmosphere.

39. 2002 Q15 P1

(a) Genus

(b) Ileum/ colon/ duodenum/ intestines/ of humans or intestines of pig

(c) Lack of elaborate elementary canal (simple guts) can tolerate raw corn

Thick cuticle pellicle, reject the outer covering lays many eggs

Mouthparts for sucking partly digested food

By pollen tube that grows through style

40. 2003 Q4 P1

a) Rhizobium

b) Convert nitrogen into nitrates / convert nitrogen into proteins / convert N2 into nitrogenous Compounds / foxed N2 into nitrates.

41. 2003 Q10 P1

- Numerous chloroplasts to absorb light / epidermis have chloroplasts to absorb light.
- Deeply divided / truncated leaves / branched leaves to increase surface area.
- Large air spaces for storage of air / buoyancy; acc parenchyma tissue for storage of air
- Have no cuticle to facilitate exchange of gases

42. 2003 Q11 P1

Salmonella typhi; Acc.Bacteria / salmonella alone

43. 2003 Q16 P1

a) i) study of a single species within a community / ecosystem / habitat / environment.

ii) Synecology?

Study of natural communities within an ecosystem

b)	**Leaf**	**Habitat**
	A	aquatic / fresh water
	B	Forest; Terrestrial

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C Arid / semi arid; desert.

c) Sunken
Hairy
Reserved rhythm
Small stomatal pore

44. 2004 Q19 P1

Wind.

In windy conditions the rate of transpiration increases; wind disperses fruits/ seeds; is an agent of pollination; acc. Spores for seed.

Temperature

Changes in temperatures affects the rate of photosynthesis and other biochemical reactions/ metabolic reactions/ enzymatic reactions/ enzymatic reactions, temperature increases rate of transpiration;

Lights

Plants need light for photosynthesis, some plants need light for flowering/ photoperiodism/ seeds like lettuce require light for germination.

Humidity

When humidity is low, the rate of transpiration increases;

PH

Each plant requires a specific pH to grow well/ acidic/ alkalinity/ neutral;

Salinity

Plants with salt tolerant tissues grow in saline area, plants in estuaries adjust to salt fluctuations;
Topography
North facing slopes in temperature lands have more plants than south facing slope
Plants on windward side have stunted/ distorted growth;
Acc. Comparisons of mountains and valleys
Acc. Description of other areas with other topographies e.g. River valley rainfall/ water

- Fewer plants in areas/ semi arid and

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- Water is needed for germination/ is a raw material for photosynthesis/ dissolves/ minerals salts/ provides turgidity for support/ fruits/ seeds

Pressure;

Variation in atmospheric pressure affect availability of CO+2+ which affects photosynthesis and low pressure increase rate of transpiration; and affect amount of oxygen; for respiration

Mineral salts/ trace elements
- Affects distribution of plants in the soils
- Plants thrive well where there are mineral salts in the soil
Plants living in the soil deficient in particular mineral element have special
methods obtaining it; for example legumes obtaining from nitrogen by fixation or
carnivorous.

45. 2005 Q10 P1
Entamoeba hystolystica

46. 2005 Q16 P1
a) - Fungus
-Bacteria

b) Refrigeration
-It inactivates disease causing organisms/micro-organisms.
Irridation –The radiation kills/destroys the micro-organism.
Pasteurization (for milk only)
Canning-Kills the micro – organisms.

47. 2005 Q17 P1
a)Photosynthesis
b)Heterotrophic – holozoic

c) Small fish pond / dam, rain forests.
d) Algae → Zoo plankton → smallfish → bird large bird.

e)-Snails would increase in number
-Bird M would increase in number.
-Green plants would decrease in number

f) The energy to be passed on from one trophic level to the next is

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contained in food materials. Most of the food taken in by consumers passed on from one trophic level to the next is consumers passes through the digestive track as undigested matter that is removed as faeces. The digested materials are absorbed in to the bloodstream and conveyed to various tissues of the body. Most of the absorbed food materials are used in respiration, to Produce is lost as heat during sweating, evaporation and transpiration in plants.

g) i) Scavengers e.g. vultures
Decomposers e.g. bacteria

ii) Scavengers feed on dead bodies of herbivores and carnivore // the consumers.
-Decomposers act upon the remains of the producers, consumers, &
Scavengers causing decay, to release inorganic materials, which are later re-used by producers to make new organic compounds.

h) i) -Deforestation
-Overgrazing
-Soil erosion
-Hunting, poaching
-Over fishing
-Poor waste disposal // Environmental pollution

ii) **Deforestation**
Lack of trees leads to reduced number producers in an ecosystem.

Overgrazing
Many animals eat away and trample the vegetation hence reducing / depleting the number of producers.
-Lead to gully erosion hence carrying away some of the underground and
crawling animals (Consumers)

48. 2006 Q16 P1

(a) Decomposer – recycling of nutrients
(b) Predation – regulation of numbers/ population

49. 2006 Q26 P1

X- Denitrifying bacteria/ denitrification
Y- Animals/ Herbivores; accept primary consumers
Z- Nitrogen fixing bacteria (in soil) accept Azotobacter.

50. 2006 Q3 P2

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(a) Pyramid of numbers is a diagrammatic representation of the number of organism, at each trophic level in a food chain; While biomass is a diagrammatic representation of dry weight organism at each trophic level in a food chain.

(b) Insufficient utilization of food resource/ wastage
Through respiration
Though excretion

51. 2007 Q15 P1

(a) Population – It is all members of a given species in particular habitat at a particular time.

Community- all organisms belonging to different species interact in the same habitat.

(b)(i) Capture and recapture method
(ii) Line transect

52. 2007 Q16 P1

- - Produce large number of eggs for increased survival
- Produce enzymes to digest human skin when penetrating
- Can withstand low oxygen concentration
- Have hooks – like structures to attach to the intestinal walls

53. 2007 Q8 P2

It is addition of substance into water that may cause harm to organisms and are disruptive to ecosystem.

The causes of water pollution include:

- Industrial effluents that may be toxic chemicals which may kill the aquatic organisms. It can be controlled by treating the effluents before discharging them.
- Hot water that reduces concentration of oxygen killing the animals. It is controlled by placing high penalties on factories discharging hot water.
- Oil spillage from oil tankers that reduces oxygen in water, penetration of light intensity and clog feathers of marine birds. It can be controlled by regular servicing of oil tankers.

Domestic effluents that include:

- Untreated sewerage that causes water borne diseases. It can be controlled by treating sewerage before being discharged.

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- Detergents that cause eutrophication causing reduced oxygen concentration. It is controlled by banning phosphate based detergents.
-

Agricultural effluents that include:

- Pesticides and herbicides that have heavy metals that they may cumulates along the food chain killing the higher animals. It is controlled by use of biological control of pests.
- Inorganic fertilizers that have nitrates and sulphates that cause eutrophication is controlled by use of organic fertilizers.

Silting due to soil erosion reduces penetration of light to the plants and clog respiratory surfaces of animals. It is controlled by proper methods of soil erosion and proper farming methods.

54. 2008 Q3 P1

(a) Hepatitis (A- E lipids)

(b) (i) Vibria chlerae

(ii) Canida/ candida albinism

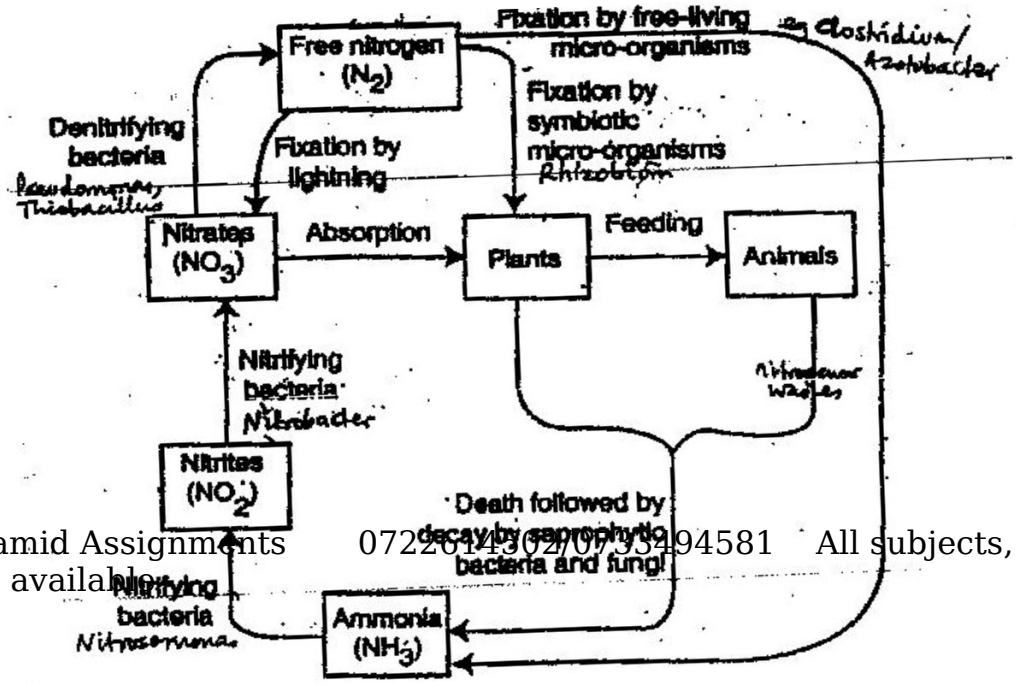
55. 2008 Q14 P1

Growth – increase/ decrease in numbers/ change in numbers

Dispersion – Spread/ distribution of organisms in a habitat

Density – Number of individual per unit area

56. 2008 Q7 P2



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During thunderstorm/ lightning; nitrogen gas combines with O_2 to form nitrogen oxides; nitrogen oxides dissolve in water to for nitric acid; acid is deposited in the soil by rain, nitric acid combines with chemical substance to form nitrates/ nitric acids dissolves to form nitrates which are absorbed by plants symbiotic bacteria/ such as rhizobium; which are found in root nodules of leguminous plants, fix free nitrogen to nitrates.

Free living bacteria/ clatridium/ azotobacteria fix nitrogen to all rates Nostoc algae/ chlorella/ anaemia/ ix nitrogen to nitrates.

Plants use Nitrates to form plant proteins
Animals feed on plants and convert plant proteins into animal proteins
Plants/ animals die and decomposed by bacteria/ saprophytes/ fungi decomposing plants/ animals/ release ammonia which is covered to nitrates/ by nitrosomomes nitrococcus bacteria
Nitrates are converted to nitrates; by nitrobacteria
Nitrates in the soil can be converted to free nitrogen/ denitrification by some fungi; pseudomonas/ hulobacillus denitrifying bacteria.

57. 2009 Q2 P1

- Obtains food/nutrients
- Shelter *Acc. Habitat* *Ref: Protection*

58. 2009 Q9 P1

(a) (i) Salmonella typhi; *Ignore underlining but must be written correct*.

(ii) Entamoeba hystolystica

(b) Malaria

59. 2009 Q19 P1

(a) – Leads to eutrophication; causes water borne disease
- Kills organisms in water; / reduce amount of oxygen in the water; / reduce the quality of water for consuming change water PH; / interferes with food charus / trophic levels

(b) Respiration / defecation / excretion;

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60. 2009 Q20 P1

– Belt transect;/
- Line transect

61. 2009 Q3 P2

(a) (i) Using a living organism to regulate / control / reduce / check the population of another organism

(ii) - Lady bird (Beetles) used to control Aphids in coffee
- Cats used to control rats in the store / snakes
- Wasps used to control coffee mealy bugs

(b) (i) Enrichment of water bodies with nitrates / phosphates / sulphate *accept* NO_3 $_{(aq)}NHT^+$ due to discharge of sewage / domestic effluent kitchen water containing water detergents / runoff water fertilizer; leading to rapid growth of aquatia plants / phytoplankton's ;

Accept: nutrients for nitrates phosphates

(ii) (Proliferation of plants) block light from reaching plants underneath which will not photosynthesize; the plants die and decompose leading to lack / depletaion of O2; animals also die/suffocate

(c) nitrogen iv oxide /sulphur iv oxide; *accept nitrogen dioxide sulphur dioxide*

62. 2010 Q13 P1

(a) Place / environment in which specified organisms live
(b) A natural unit with abiotic and biotic factors

63. 2010 Q25 P1

- Overcrowding
- Accumulation of toxic wastes
- Limited resources such as nutrients.

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64. 2010 Q3 P2

a) i) Primary consumer

ii) Primary consumer / Secondary consumers;

b) Green plants → Caterpillars → Small insects → lizard

Decaying leaves → Caterpillars → Small insects → lizard

c) i) Hawks;

ii) At each trophic level energy is lost as heat / respiration; and during decomposition; or lost in defecation/ feces/ waste products of metabolism/ excretion; some parts of the organism are not eaten; (hence less biomass as one moves up the tropic levels.

65. 2011 Q5 P1

(a) Grass → Grasshopper → Lizards;

(1mark)

(b)(i)Chicken;

(ii)Grass

(2marks)

66. 2011 Q6 P1

(a) This is the study of the inter-relationship between organisms and their environment;

(b) The maximum population of a species that a particular habitat can support.

67. 2011 Q3c P2

Grow into the air above mud / water; have lenticels for gaseous exchange;

68. 2012 Q5 P1

(a) plant C

(b)This cuticle reduces water loss;

Low number on upper surface reduces water loss;

Large root surface area enhances water absorption;

NB; (b) tied to (a)

69. 2012 Q21 P1

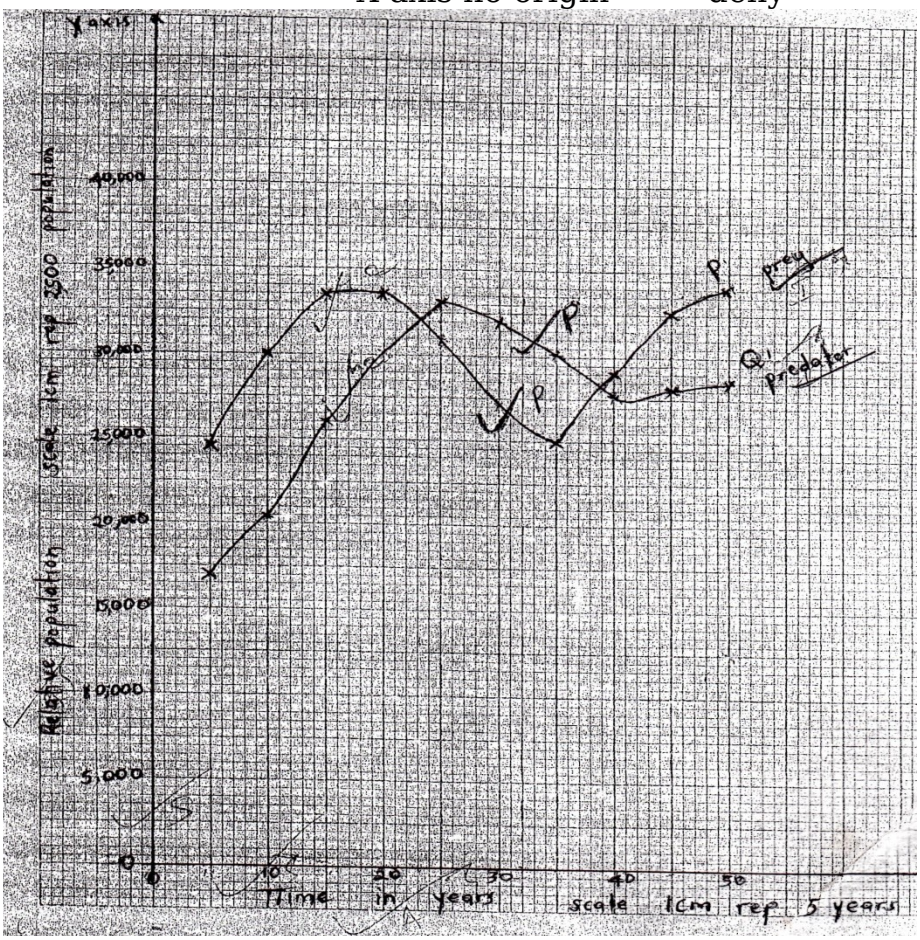
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Nitrogen fixation

70. 2012 Q6 P2

(a) (i) Scale = Y axis no scale

X axis no origin = deny



(ii) Curve P; Prey population is initially higher/prey population usually starts falling earlier.

(iii) Both populations decrease,because prey is not enough to sustain

predator Population/environmental stress limit population of

(iv) At 23 ±0.5; 22.5,23.5

39±0.5; 38.5,39.5

(v) Human activities; Acc pollution/deforestation/translocation

/culling/hunting/Poaching/afforestation.

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Competition; for mates/space/water
Less food for prey/competition for food;
Diseases causing death of prey
Emigration of prey Acc migration out of habitat.
Parasitism Acc parasite,pathogens

b) Sulphur IV oxide in the air causes respiratory diseases;in high concentration it can kill
humans/damage plants. Acc aggravates asthma, causes bronchitis/pneumonia/emphyserna
Forms acid rain; which decreases soil PH;corrodes metals/buildings/machines/stones/sculptures
acid rain poisons/damages/kills plants/kills animals;
acid rain causes leaching of magnesium mg^{2+}/calcium ca^{2+}/aluminum Al^{3+}

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