

EVOLUTION MARKING SCHEME

1. 1989 Q7 P1

(a) Lamarckian

Inheritance of acquired characteristics/ Environment induces production of inheritable character which is then inherited.

Darwinian

Inheritance of genetically acquired characteristics/ character happens to appear spontaneously which then gives advantage to organisms therefore better-adaptable characters are then inherited by natural selection.

2. 1991 Q17 P1

- (a) Nature selects those individuals, who are sufficiently well adapted; reject those that are poorly adapted
- (b) – individuals of the same species show certain variations; these variation differences are caused by genes; these variations or genetic difference can be passed from parents to offspring; through genetic inheritance, some of the character of variation become more suited to the prevailing environment all conditions due to selection pressure most organisms generally produce offspring than environment can support, therefore man is always (attendance for) struggle for existence due to competition among individuals, those individuals possess characters that enable them to have (competitive) advantage to survive i.e they withstand better character to survive in the struggle; the results the well adapted individuals are able to survive and reach the reproductive age ; and hand over / grass over the favourable characteristics for the offspring, those who are poorly adapted those who do not possess the favorable genes/ traits/ characteristic fail to reach sexual maturity and therefore do not pass their genes to their offspring; and thus perish; to fittest survive;

Allow valid examples e.g.

- Peppered moths/ long necked giraffes
- Hooves of horses, evolution
- Sickle cell anaemia
- Mosquito resistance to drugs

3. 1992 Q5 P1

Adaptive radiation / divert radiation

4. 1992 Q18 P1

- For a new species to be formed, a population of organisms must become completely isolated / separated from the others; over a period of time so that any new variation that will rise not therefore flow to the other population ; isolating mechanisms
- Geographical isolation; this is due to physical barriers eg Oceans/seas /deserts
- Ecological isolation; a barrier resulting from the occupation of different types of habitats from the original type
- For reasons of feeding / predation/ breeding as well as environment changes ;(eg. Climate and vegetation which may result in population living in different habitats so becoming ecological separated from one another)
- Behavioral isolation; alteration in behavior proceeding mating; which include courtship behavior / lack of attraction between males and females in different population; due to production of different chemicals / pheromones / coloration / songs etc.
- Reproduction isolation: a barrier successful mating between individual of population; due to structural differences in reproductive organs as well as failure in fertilization / incompatibility.
- Genetic isolation: Even if fertilization takes place the zygote may be inferior / fails to develop; however, if the zygote develops the offspring may be inferior or sterile.

5. 1995 Q8 P1

Evidence does not support Lamarck's theory
Acquired characteristics are not inherited characteristics are found in reproductive cells only

6. 1996 Q11 P1

Gametes form new offspring

7. 1997 Q9 P1

Fossil (records) paleontology; geographical distribution
Comparative anatomy/taxonomy; cell biology
Comparative serology; comparative embryology
Comparative immunology

8. 1998 Q19 P1

Comparative anatomy/taxonomy.

Members of a phylum group show similarities; organisms have similar structures/similar organs performing similar functions e.g. digestive system/urinary system, nervous system. Any correct example i.e. vertebrate heart.

The pentadactyle limbs/ any correct example; these are homologous organs/structures. Homologous – same origin structure different functions. Analogous structures – different structures performing the same function e.g. wings of insects, bats and birds. Analogous different origin structure, same function convergent.

Fossil records/palaeotology

These are remains of organisms preserved in naturally occurring materials for many years show morphological changes of organisms over a long period of time.

Comparative embryology.

Acc. Any 2 names embryos > vertebrate embryos the morphologically similar; suggesting the organisms have a common origin/ancestry.

Geographical distribution.

Present conditions are thought to have been a large land mass joined together, as a result of continental drift; isolation occurred bringing about different patterns of evolution i.e. The llamas in the Amazon resemble the Camel. Any other example e.g. Kangaroos in Australia, Jaguar in South America, Camel in Africa.

Comparative serology/physiology.

Antigen/antibody reactions/Rh factor/blood group/haemoglobin structure; reveal some phylogenetic structure. Relationship among organism/common ancestry.

9. 1999 Q4 P1

- Assists to eliminate disadvantages characteristics.
- Allow better organisms to survive (adverse changes) in the environment / less adapted organisms are eliminated by (adverse changes) in the environment

10. 2000 Q7 P1

(a) Fossils records

Gives evidence of types of plants/ animals/ organism that exist at a certain geological age. Long ago

Gives evidence of morphological/ anatomical. Structure/ changes that have occurred over a long period of time.

(b) Comparative anatomy.

Gives evidence of relationship among organisms

Gives evidence of common ancestry of a group of organisms; e.g. structural/ functional relationship among organization

11. 2002 Q14 P1

- (a) Emergence of present fauna and flora/ new life
Term/ species/ organisms from pre-existing forms gradually over a long period of time.
- (b) Standing upright/ erect posture. Higher intellectual capacity/ higher brain/bigger capacity; communication through language speech.
- (c) Divergent basic structural form is modified to serve different functions; e.g. vertebrate forelimbs, break structure in birds/ feet in birds' convergent different structures are modified to pass or similar functions e.g. wings and birds and insects/ eye of human and octopus, vertebrates for humans e.g. squeal, legs of vertebrae and insects.

12. 2003 Q6 P1

Analogous structures – structures which (appear similar and) perform similar functions but have different origins.

Homologous structures – structures which have a common origin but (have evolved to) perform different functions.

13. 2004 Q14 P1

(a) Lamarckian

Inheritance of acquired characteristics/ Environment induces production of inheritable character which is then inherited.

Darwinian

Inheritance of genetically acquired characteristics/ character happens to appear spontaneously which then gives advantage to organisms therefore better-adaptable characters are then inherited by natural selection.

- (b) (i) Have a common (embryonic) origin modified to perform different functions; vertebrae for limb/ pentadactyl limb
Example
Vertebrate for limb/ pretadactyl limb; acc beaks of birds (fee of birds/ mouthparts in insects.
- (ii) Have different (embryonic) origins (but have evolved) to perform similar functions.
- (iii) Are greatly reduced in size and therefore caused to function
Acc. Third digit of wing of bird
 - Halteres in flies
 - Presence of hind limb (buds) in python
 - Human ear muscles

Example

Human appendix / kiwi (flightless bird) with reduced wings/ vestigial wings in flies human hair/ presence of hind limbs in python; reduced pelvic girdle of whale.

14. 2005 Q4 P1

- a) It is the process through which ancient simpler forms of life under went gradual series of small changes for many million years, to give rise to the modern species of life
- b) accepts as a theory formed one large single land mass, which later broke up into parts which drifted from one another forming the present day continents.

15. 2006 Q15 P1

Current continents existed as one large land mass/ Pangea/ Lareshia Guondaland; the present continent drifted leading to isolation of organisms; organism in each continent evolved along different lines hence emergence of new species,

16. 2007 Q21 P1

- (a) When organisms of the same origin become adapted (modified) in different ways in order to fit in the environment. The organisms are separated due to natural factors.
- (b) When an organism is exposed to drug for sometime it becomes modified (adapted) to living in presence of the drug. The offspring produced therefore survive in presence of the drug. Hence drug resistant.

17. 2008 Q7 P1

- (a) Premedial remains of dead organisms that lived in accent sample
- (b) When two dissimilar species/ structures/ organisms of different embryonic origin; change in same and develop similar characteristics/ or modify to perform similar function

18. 2009 Q10 P1

- (a) (i) Order: ceased to function then reduced in size
Are those structures that have ceases to be functional over a long period of time and hence reduced in size;
- (ii) Appendix / coccyx / tail (tail bone) / semi – lunar folds of cornea of eye / nictitating membrane caecum / ear muscles / body hair;/ *Acc. Post anal tail*
- (b) Disease causing organisms mutate; and become resistant;

19. 2010 Q24 P1

- (a) Use and disuse
Acquired traits can be passed on to offspring
- (b) Acquired characteristics cannot be inherited
-No evidence to support the theory

20. 2011 Q21 P1

(a) Where different structures evolve to perform the same function (e.g. wings of insects and birds are different in structure but are used for flying) (1 mark)

(b) Missing links;

- Distortion of parts during sedimentation
- Destruction of fossils by geological activities; (2 marks)

21. 2011 Q2d P2

Vertebrate embryos have similar morphological features; which suggest a common ancestry; **OR** In Invertebrates, annelids and molluscs have similar blastula trophore larvae. At least two morphological features, single circulatory system, segmental myotomes, gill slits/ visceral, notochord, tail.

22. 2012 Q22 P1

Results in adaptations that enable organisms to exploit different ecological niches; leads to the formation of new species/speciation

23. 2012 Q26 P1

(a) Charles Darwin .. Theory of natural selection;

Jean-baptiste de Lamarck;- theory of environmental influence on inherited characteristics/inheritance of acquired characteristics

(b) (i) cell organelles –similar organelles performing similar functions in different organisms suggest a common ancestor

(ii) fossils- fossil records/paleontology; Acc By comparing the fossils of different organisms it's possible that the phylogenetic relationships between organisms/common ancestry