Benha University
Faculty of Science
Geology Department
Date: 3-1-2019

Paleoecology (G 667)
Final Exam (80 marks)
Time Three Hours
Msc. Stratigr. & Paleontology

Answer

Paleoecology (Part 2) 40 marks

Answer four questions only from the following:

I- Write on rules of taphonomy (10 marks)

1- **Organisms have been preserved if they have hard parts**
2- **Preservation is greately enhanced by rapid burial**
3- **During the transition biocoenosis to thantocoeonsis disarticulation and chemical alteration resulting from decay, abrasion, transportion, predation, scavenging, or dissolution cause loss of information about species abundance, and community diversity and structure**
4- **Fossil assemblages consists of autochtonous remains, parautochtonous remains, alochtonous remains**
5- **Taphonomic loss especially, through dissolution and bioerosion is typically in shallow water environment.**
6- **Information loss in terrestrial and fluvial biota results from transportion, disarticulation, sorting, predators, and scavengers.**
7- **Bioturbation and physical reworking also cause time averaging.**
8- **False First and Last Appearance Datums (FADs and LADs) may result from bioturbation and reworking.**

II- Discuss the models and classifications of fossils assemblages

…… (10 marks)

There are four models
1- Johnson's model for assemblage formations
Which subdivided into three models; Model I, Model II, Model III.

2- Biostratinomic Classification
Kidwel et al. 1986 developed a descriptive nomenclature and genetic classification
The genetic classification include
a- Taxonomic composition
b- Biofabric
c- Packing
d- Internal structure
3- The R-Sediment model
4- 4- Taphofacies

III- Discuss the necrolysis, transport, and abrasion in echinoderms and vertebrates …… (10 marks)

A- Echinoderms

The trasportion of the tests may result in the fragmentation especially in the crinoids which need specific conditions to preserve their stems and crowns.
In echinoids, the first stage in the necrolysis of echinoids is losing the spines of their tests.
Excessive transport may lead to excessive fragmentation and abrasion

B-Vertebrates

1- The mammals:

The bones of mammals have been affected by all forms of diagensis before it fossilized.

2- the reptiles:

The dinasours also reject to the same manner in necrolysis andtransfers as mammals

3- The birds:

The bone of birds are hollow and are more subject to fragmentation.

IV- Write on dissolution and early diagenesis in fossil assemblages…….. (10 marks)

The dissolution of calcium carbonate that make most of the shells of invertebrates being due to high ph
$Ca\ CO3 + H2O$ ……. $HCO3+ CaOH$

and the dissolution occure to the shells, as when the shells are composed of material different than the matrix the dissolution differs than in the case of both shells and their contained sediments are from the same material.

V- Compare between Ediacaran, Burgess Shale, and Solnhofen associations…… (10 marks)

Edicara fossils: Fossils of many called animals appear near to the close of the Proterozoic (Edicaran or the last Period of

Neoproterozoic Era). They represent fossils of three phyla (Coelenterates, Annelids, and Arthropods)
Ediacara-type fossils represent a group of soft-bodied organisms, mainly known from imprints.

Burgas Shale. Rich fossil beds in British Columbia

Shale has small clay-sized grains, which means the area was low-energy - less destruction of dead organisms, even soft ones

Organic rich means the area where the organisms landed was anoxic - reduces decay and breakdown of dead organisms

The Burgess organisms represented a number of forms not seen before or since.

Solnhofen limestones are those rare fossil occurrences of soft-bodied animals which are rarely preserved in the geologic record.

Near **Solnhofen-Eichstatt area (Southern Germany), there are deposits of very fine-grained limestone (Solnhofen limestone)** was deposited in quiet broad lagoon in the Late Jurassic.

This limestone contains fishes, jellyfish, insects, pterosaurs, birds, and many other forms.

The body outlines showing jellyfish tentacles, insect wings, pterosaur wing membranes, and the feather of the oldest birds are preserved as impressions. A similar deposits were found recently in the U. S. S. R.