

10×2=20

questions:

উত্তর দাও :

relationship between Human capital
development.

ন ও অর্থনৈতিক উন্নয়নের মধ্যে সম্পর্কটি

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the conflict between (i) employment
and (ii) employment and savings,
in the choice of technique in the
developing countries.

দেশে উৎপাদন কৌশল নির্বাচনের সঙ্গে জড়িত (i)
উৎপাদন এবং (ii) নিয়োগ ও সঞ্চয়ের মধ্যে সংঘাত
গণনা কর।

explain the possible sequences of
an unbalanced growth strategy. What
is the most efficient sequence for
induced decision making? 7+3

উন্নয়ন কৌশলে বিভিন্ন প্রকল্পের ক্রমিক পর্যায়গুলি
কর। 'প্রগোদিত সিদ্ধান্ত গ্রহণ' সর্বোচ্চ করার ক্ষেত্রে
ক্রমিক পর্যায় কি হতে পারে।

base their migration decision on their
and income'—explain this proposition
table model.

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তাদের অনুমিত আয়ের উপর ভিত্তি করেই প্রচরণ
গণ করে'—একটি উপযুক্ত মডেলের সাহায্যে উক্তিটি

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602/Zool UG/6th Sem/ZOOL-H-CC-T-14/23

U.G. 6th Semester Examination - 2023

ZOOLOGY

[HONOURS]

Course Code : ZOOL-H-CC-T-14

(Evolutionary Biology)

Full Marks : 40

Time : 2½ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in
their own words as far as practicable.

1. Answer any five questions of the following:

2×5=10

- Write down any two characteristics of modern man.
- What is meant by neutral theory of evolution?
- What are the factors that must hold true for a population to be in H-W equilibrium?
- What is the cause and effect of an evolutionary bottleneck?
- What is a phylogenetic tree? Write down one disadvantage of parsimony.

c) i) Define and differentiate between monophyly, paraphyly and polyphyly. Which one is less important in the context of constructing a phylogeny? Why?

ii) What is meant by the term 'polytomy'? $(3 + \frac{1}{2} + \frac{1}{2}) + 1$

d) What are the five major types of selection noted? Explain with diagrams wherever needed. 5

3. Answer any two questions of the following: $10 \times 2 = 20$

a) i) Maroon body colour in mature sea urchins is dependant upon a dominant allele M and black colour upon its recessive allele m . If 14 black urchins are detected in a population of 900, estimate the allelic frequencies. 4

ii) What is meant by a fossil? Describe the path of evolution of *Sahelanthropus* to *Homo erectus*. 6

b) Elucidate the concept of adaptive radiation in the light of evolution in the Geospizinae. Give examples. 6+4

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[Turn Over]

f) When does neanderthal man appear in the fossil records? Write one distinguishing feature of Neanderthals.

g) Write down two specific points of similarity between hominid and primate skeletons.

h) What is the significance of synapomorphy in phylogeny?

2. Answer any two questions of the following: $5 \times 2 = 10$

a) Write short notes on (any two): $2 \frac{1}{2} + 2 \frac{1}{2}$

i) Effects of divergence in evolution

ii) Genetic drift

iii) Explanation of the statement of Hardy-Weinberg law

b) i) Explain advantages and disadvantages of Biological Species Concept (two of each).

ii) Explain the concept of molecular clock.

iii) Differentiate (any two) between *Eohippus* and *Merychippus*.

$(1+1)+1+(1+1)$

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- c) i) Explain the concepts of Natural Selection, Selection Coefficient and Hetrozygous superiority. 6
- ii) Explain the advantages and disadvantages of construction of phylogenetic trees using distance methods. 4
- d) i) Given gene *A* is at frequency 0.23 and gene *B* is at frequency 0.16, find the equilibrium frequencies of the gametes AB, Ab, aB, ab. 4
- ii) Given that in a set of five species A, B, C, D and E
- B and C are more closely related to each other than to any other species
 - A is related to B and C, but not as closely as B and C are related to each other
 - D and E are more closely related to each other than to A, B or C.
- Construct a phylogenetic tree based on relatedness. 6

