U.G. 4th Semester Class test (NEP)
Department of Zoology
Raghunathpur College
Course Title: Molecular Biology and Developmental Biology
Course code -BZOOMAJ04C (Major)

Full Marks: 60 **Time: 3 hours**

1 Answer any **ten** questions from the following: 2×10=20

a) What is primary organizer? Give example in case of chick and frog.
b) Differentiate between meroblastic and holoblastic cleavage.
c) What is Mid Blastula Transition (MBT)?
d) What is a TATA Box?
e) What is the role of cAMP in lac operon?
f) Differentiate between BER and NER.
g) Why replication is a bidirectional process?
h) Define differentiation.
i) Name the germ layers formed during gastrulation.
j) Mention two applications of PCR.
k) What is cortical reaction?
l) What is a spliceosome? Mention the significance of RNA splicing.
m) Mention two functions of mRNA.
n) What are the roles of Mut-S, Mut-H and Mut-L in DNA repair?
o) What do you mean by cephalic and cervical flexures?

2. Answer any **six** questions from the following: **5×6= 30**

a) Distinguish between epimorphosis and morphallaxis with suitable examples
b) Discuss in brief miRNA-mediated gene silencing.
c) Explain different types of blastula with examples.
d) What is epigenetic regulation? Describe DNA methylation process and its significance.
e) Briefly describe the development of eye in chick with diagram. 3+2
f) Draw and describe the ultrastructure of a sperm. What is fate map? What is vital dye? 3+1+1
g) What is Nieukoop center? Briefly describe the role of dorsal lip of blastopore as primary organizer with the help of Spemann and Mangold's experiment. 1+4
h) Write the role of beta-clamp loader in DNA replication. Briefly describe the 5' capping in mRNA. 2.5 +2.5
i) Distinguish between prokaryotic and eukaryotic transcription. Describe histone acetylation and its significance. 2.5 +2.5

3. Answer any **one** question from the following: 1×10=10

a) Discuss implantation of human embryo and explain types based on distribution of chorionic villi and functions of placenta. 5+5
b) List the enzymes involved in prokaryotic DNA replication and mention their functions. Add a note on telomere replication.
c) Describe the expression of Y, Z and a gene in the presence and absence of lactose in the medium.

Genotype
$i^+ p^+ o^+ z^- y^- a^+ / i^+ p^+ o^+ z^+ y^- a^+$
$i^s p^+ o^+ z^+ y^- a^- / i^+ p^+ o^+ z^- y^+ a^+$
$i^{-d} p^+ o^+ z^- y^- a^- / i^+ p^+ o^+ z^+ y^- a^+$
$i^+ p^+ o^+ z^- y^- a^+ / i^+ p^+ o^c z^+ y^- a^+$
$i^s p^- o^c z^- y^- a^+ / i^- p^+ o^+ z^+ y^- a^+$