[130] SEAT No._____ No. of Printed Pages: 02

SC

SARDAR PATEL UNIVERSITY

M. Sc. ZOOLOGY (SEMESTER II) EXAMINATIONS

Day and Date: Monday, 18th March, 2019 Time: 2:00 pm to 5:00 pm

PS02CZOO21: DEVELOPMENTAL BIOLOGY

MAXIMUM MARKS: 70

Q.1. Select the most appropriate answer. 8x1 = 8 M

1. Which of the following ligand is involved in Juxtacrine Signaling pathway?
   (a) Delta (b) FGF (c) VEGF (d) BMP
2. The ZPA region of vertebrate limb is involved in the specification of mainly ..... axis.
   (a) Proximo-Distal (b) Anterior-Posterior (c) Dorso-Ventral (d) All three axis
3. Before fertilization partitioning-proteins in *C. elegans* are distributed as
   (a) Internal cytoplasm- PAR2, PAR1; Cortical cytoplasm – PAR3, PAR6
   (b) Internal cytoplasm- PAR3, PAR6; Cortical cytoplasm – PAR2, PAR1
   (c) Internal cytoplasm- PAR1, PAR3; Cortical cytoplasm – PAR2, PAR6
   (d) Internal cytoplasm-PAR3, PAR4; Cortical cytoplasm – PAR5, PA6
4. The temperature regulation centers are located in _____.
   (a) Telencephalon (b) Diencephalon (c) Mesencephalon (d) Myelencephalon
5. Name an organism with development of mouth formed after formation of anus.
   (a) Flatworm (b) Annelids (c) Molluscs (d)Echinoderms
6. In mammals, amniotic cavity develops from _____.
   (a) Trophoblast (b) Hypoblast (c) Epiblast (d) Embryonic ectoderm
7. Ecdysone receptor binds with _____ for subsequent nuclear activities.
   (a) Omb (b) Dpp (c) Usp (d) Hid
8. High level of ecdysteroids is observed during _____ stage.
   (a) 1st instar (b) 2nd instar (c) 3rd instar (d) Pupa

Q.2. Briefly answer the following questions. (Seven out of Nine) 7x 2=14 M

1. State the major biochemical changes occurring in sperm during capacitation.
2. Enlist the major neural tube closure defects and write their reasons.
3. Explain myoblast fusion.
4. Name the homeotic selector genes in drosophila and write their significance.

(P.T.O.)

5. Name any four structures developing from endoderm and write about their specification.

6. Name different stages of heart development and mention the factors regulating those stages.

7. State the role of major factors involved in inducing apoptosis and factors also in preventing apoptosis during the development of fingers.

8. Briefly write on teratogenic agents

9. Differentiate the metamorphic changes in anuran larva and adult.

Q.3 (a) Describe the following signal transduction pathways involved in regulation of embryonic development : **6 M**

(I) FGF-RTK pathway (II) Hedgehog – Patched pathway (III) TGF-Smad Pathway

(b) Discuss axis specification in birds and mammals. **6 M**

OR

(b) Write a note on cranial neural crest and trunk neural crest cells **6 M**

Q.4 (a) Explain the following in axis specification in drosophila: **6 M**

(i) Role of maternal gradients in anterior-posterior axis specification.
(ii) Dorso-ental axis specification.

(b) Discuss blood vessel construction from lateral plate mesoderm by vasculogenesis and angiogenesis. **6 M**

OR

(b) Discuss formation and specification of somites. **6 M**

Q.5 (a) Describe the gastrulation in Sea Urchin. **6 M**

(b) Describe the cleavage pattern in amphibia, birds and mammals. **6 M**

OR

(b) Discuss different gastrulation movements and explain gastrulation process in *C. elegans*. **6 M**

Q.6 (a) Provide an overview of morphogens in insect leg and wing imaginal disc formation. **6 M**

(b) How do hormones influence the process of metamorphosis in amphibia? **6 M**

OR

(b) Give details about polyphenism as an environmental regulator. **6 M**

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(2)