MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

SECOND YEAR FIRSTSEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN BIOLOGY

SZL 203: DEVELOPMENTAL BIOLOGY

DATE: 18/12/2017 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

Answer Question One and Any Other Two Questions
Use clean well labelled diagrams wherever appropriate.

1.	a)	Describe three (3) disorders that result from improper neurulation	(3 marks)
	b)	Explain "ontogenetic development"	(3 marks)
	c)	Outline the role of the hormone Oestrogen in mammalian reproduction	(3 marks)
	d)	Describe the polarity of an ovum	(3 marks)
	e)	Illustrate the structure of an insect egg before ovulation	(3 marks)
	f)	Outline three procedures of drawing fate maps	(3 marks)
	g)	Explain epimorphosis and methods in which it may occur	(3 marks)
	h)	Outline the regulation of metarmorphosis in insects	(3 marks)
	i)	Briefly explain parthenogenesis as a mode of reproduction	(3 marks)
	j)	Explain ovoviviparity in sexual reproduction	(3 marks)
2.	a)	Describe the process of gastrulation in mammals.	(10 marks)
	b)	outline the various types of cleavage in mammalian embryology	(10 marks)
3.		Discuss metamormophosis in amphibians	(20 marks)
4.		Discuss embryonic induction in vertebrates	(20 marks)
5.	a)	Discuss the function of extra-embryonic membranes during human embryology	(10 marks)
	b)	Describe the stepwise development to viviparity	(10 marks)

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SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR FIRSTSEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN BIOLOGY

SZL 305:INTRODUCTION TO MOLECULAR BIOLOGY

DATE: 14/12/2017 **TIME: 11.00-1.00 PM**

INSTRUCTIONS

Answer Question One and Any Other Two Questions
Use clean well labelled diagrams wherever appropriate.

1. a) Outline any three practcal applications of molecular techniques. (3 marks)
   b) Briefly decribe DNA cloning (3 marks)
   c) Outline reverse transcriptase (3 marks)
   d) Outline any three applications of ELISA in medical practice. (3 marks)
   e) Describe the structure of the cell nucleus (3 marks)
   f) Outline the principal uses of gel eletrophoresis (3 marks)
   g) Explain why the genetic code is described as *degenerate* (3 marks)
   h) Explain what GMOs are (3 marks)
   i) Differentiate between the following:
      i. *lytic* and *lysogenic* life cycle of a bacteriophage (2 marks)
      ii. *Plasmid* and a *transposon* (2 marks)
      iii. *Nuleoside* and *nucleotide* (2 marks)
2. Discuss the procedure of a named PCR (20 marks)
3. a) Compare the processes of transcription and translation in DNA (10 marks)
   b) Discuss the formation of a polypeptide chain in eukaryotic cells (10 marks)
4. Discuss the principle and the procedure of molecular cloning (20 marks)
5. a) Discuss the replication of a named bacteriophage (10 marks)
   b) Desribe hydrogen bonding in the structure of DNA (10 marks)

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SCHOOL OF PURE AND APPLIED SCIENCES
DEPARTMENT OF BIOLOGICAL SCIENCES
FOURTH YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF SCIENCE IN BIOLOGY
SZL406: MEDICAL HELMINTHOLOGY

DATE: 14/12/2017 **TIME: 11.00-1.00 PM**

INSTRUCTIONS

Answer Question One and Any Other Two Questions
Use clean well labelled diagrams wherever appropriate.

1. a) State the predisposing factors to infection by *Echinococcus granulosus* in man (3 marks)

   b) Explain any three methods of prevention of infection by *Trchinella spiralis* (3 marks)

   c) Outline the methods of infection to man by *Tichuris trichura* (3 marks)

   d) Explain the epidemiology of schistosomiasis in Kenya (3 marks)

   e) Briefly describe sexual reproduction in *Schistosoma mansonii* (3 marks)

   f) Explain the adaptations of trematodes to a parasitic mode of life (3 marks)

   g) Illustrate the structure of a mature proglottid of a tape worm (3 marks)

   h) Explain the pathogenicity of the following disease conditions in Kenya:

      i. Schistosomiasis (3 marks)

      ii. Hydatidosis (3 marks)

   i) Describe the modes of reproduction in tape worms (3 marks)

2. a) Outline the general life cycle of nematodes (8 marks)

   b) Trace the migratory life cycle of a named nematode (12 marks)

3 Discuss the lifecycle of *Fasciola hepatica* (20 marks)

4 Classify the phylum Platyheminthes using appropproprite examples and state the economic importanceof each taxon. (20 marks)

5 Compare the management approaches to Filariasis and Schistosomiasis in Kenya (20 marks)

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SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR OF ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT

ERC 411:BIOLOGICAL CONTROL AND THE ENVIRONMENT

DATE: 6/12/2017 **TIME: 2.00-4.00 PM**

INSTRUCTIONS

Answer Question One and Any Other Two Questions
Use clean well labelled diagrams wherever appropriate.

1. a) Briefly explain the concept of IPVM (3 marks)

   b) Differentiate between the following biological concepts:

      i. Insect rearing and insect mass rearing (2 marks)

      ii. Control and eradication (3 marks)

      iii. Parasites and parasitoids (3 marks)

   c) Justify the need for tsetse control in Kenya. (3 marks)

   d) Explain why rangelands are described to have fragile environments (4 marks)

   e) Explain the possible consequences to the environment of elimination of East Coast Fever in Kajiado County; Kenya (3 marks)

   f) Justify the eradication of *Cochliomyia Hominivorax* (3 marks)

   g) Explain any three constraints to tsetse mass rearing in Kenya. (3 marks)

   h) Explain the biological control of a named fruit fly (3 marks)

2. a) Discuss the use of biological control of weeds in Kenya. (10 marks)

   b) Describe the control of spidermite aphids in kenya. (10 marks)

3. Discuss using specific examples, the types of biological control (20 marks)

4. a) Discuss the components of an insect control program (10 marks)

   b) Explain the role of research in an insectt control program (10 marks)

5. Discuss the principle of 'SIT', its requirements, and procedure for the eradication of a tsetse fly infestation (20 marks)