UNIVERSITY OF MUMBAI
No.UG./ 407 of 2006

CIRCULAR :-

A reference is invited to the Ordinances, Regulation and Syllabi relating to the Master of Science (M.Sc.) (Parts I & II) degree examination *vide* Pamphlet No.175 and to this office circular No.UG/195 of 1998 dated 2nd June, 1998 and the Directors/Heads, recognized Institutions concerned and the Principals of the affiliated colleges in the faculty of Science are hereby informed that the recommendation made by the Board of Studies in Zoology at its meeting held on 1st August, 2006 has been accepted by the Academic Council at its meeting held on 18th August, 2006 *vide* item No.4.15 and that in accordance therewith the Pattern of question paper for Theory and Practical examination in the subject of Zoology at the M.Sc. (Part-II) examination is as per Appendix and that the same has been brought into force from the examination to be held in the first half of 2007

MUMBAI-400 032
4th October, 2006

for REGISTRAR

To,

The Directors/Heads, recognized Institutions concerned and the Principals of the affiliated colleges in the faculty of Science

AC/4.15/18.08.2006

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No.UG/ 407-A of 2006, MUMBAI-400 032 4th October, 2006.

Copy forwarded with compliments for information to :-

1)The Dean, Faculty of Science.
2) The Chairman, Board of Studies in Zoology

for REGISTRAR

Copy to :-

The Director, Board of College and University Development, , the Deputy Registrar (Eligibility and Migration Section), the Director of Students Welfare, the Personal Assistants to the Vice-Chancellor, the Pro-Vice-Chancellor, the Registrar and the Assistant Registrar, Administrative sub-center, Ratnagiri for information .

The Officer on Special Duty-cum- Controller of Examinations (10 copies), the Finance and Accounts Officer (2 copies), Record Section (5 copies), Publications Section (5 copies), the Deputy Registrar, Enrolment, Eligibility and Migration Section (3 copies), the Deputy Registrar, Statistical Unit (2 copies), the Deputy Registrar (Accounts Section),Vidyanagari (2 copies), the Deputy Registrar, Affiliation Section (2 copies), the Director, Institute of Distance Education,(10 copies) the Director University Computer Center (IDE Building), Vidyanagari, (2 copies) the Deputy Registrar (Special Cell), the Deputy Registrar,(PRO) , the Assistant Registrar, Academic Authorities Unit (2 copies)and the Assistant Registrar, Executive Authorities Unit (2 copies) . They are requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to in the above Circular and that no separate Action Taken Report will be sent in this connection the Assistant Registrar Constituent Colleges Unit (2 copies), BUCT(1 copy), the Deputy Account, Unit V(1 copy), the In-charge Director, Centralize Computing Facility (1 copy), the Receptionist (1 copy), the Telephone Operator (1 copy), the Secretary MUASA (1 copy), the Superintendent, Post-Graduate Section (2 copies), the Superintendent, Thesis Section (2 copies)

Cir-III/Nnm/03.10.06.

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Enclosure to Item No. 4.15
18/08/06

UNIVERSITY OF MUMBAI

Pattern of question paper For Theory & Practical Examination of M.Sc.Part-II in Zoology

(With effect from the examination to be held in the first half of 2007)

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University Of Mumbai
Question Paper Pattern (Practical) Of M.Sc. II Zoology (Revised 2006-2007) For the Examination to be Held in the First Half of 2007

M.Sc. Part II Zoology (Revised Course)

Theory (Papers V, VI, VII & VIII)

Duration: 3Hrs **Marks: 75**

Q1.	Unit I or Unit I	15
Q2.	Unit II or Unit II	15
Q3.	Unit III or Unit III	15
Q4.	Unit IV or Unit IV	15
Q5.	Three Short Answers from Unit I to Unit IV	15
	Or	
Q5.	Three Short Notes from Unit I to Unit IV	15

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical V & VI Biotechnology
(Two Days)

Duration: 5Hrs (with additional 30 min lunch break) Marks: 100

Q1. Major Experiment

Q2. Major Experiment

Q3. Minor Experiment

Q4. Minor Experiment

Q5. *Viva-voce*

Q6. Journal

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII & VIII (Animal Physiology)

Duration: 5Hrs (with additional 30 min lunch break) **Marks: 50**

Day I

Q1. Major Question: (Submit a report to the examiner) 20

From the animal provided prepare an extract of salivary glands/stomach/intestine/liver. Using this extract as Enzyme source determine the level of activity of amylase/ Trypsin/pepsin/lipase.

OR

Determine the Km of salivary amylase and demonstrate the effect of pH/temperature/activator/inhibitor on the activity of salivary amylase.

OR

Set up an experiment to demonstrate the effect of different concentrations of sodium chloride on the diameter of RBCs, from the sample of blood provided. Plot a graph of diameter of RBCs, as a function of concentration of sodium chloride. Determine which is isotonic to the blood. [N.B.:- 3 concentrations less than and 3 concentrations more than isotonic concentration and one with isotonic value should be used to set up the experiment]

OR

Calculate and compare total RBC/total WBC/ Differential WBC of any two animals (belonging to different classes) you have studied.

OR

Demonstrate the effect of insulin/glucagon on the glycemic level/hepatic glycogen content in rat/mice.

OR

Using the material provided, set the gel, load the sample and carry out electrophoresis to test the purity of the antibody. Show the results to the examiner.
[N.B. :- Results to be observed on the subsequent day]

OR

Using the material provided, set the gel, load the sample and carry out the experiment to demonstrate single radial immunodiffusion of antigen and antibody. Plot a graph and show results to the examiner.
[N.B. :- Results to be observed on the subsequent day]

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Q2. Minor Question: 15

Estimate content of urea/uric acid/creatinine/bilirubin/cholesterol/inorganic phosphate from the sample fluid (plasma/serum/urine) provided.

OR

Prepare a glycerinated muscle fiber. Demonstrate the effect of ATP and Mn^{++}/ATP and Mg^{++}/ATP and KCl /ATP and $CaCl_2$ and NaCl on the muscle fiber. Submit a report.

OR

Demonstrate Ouchterlony technique to show immunodiffusion. Show the results to the examiner.

[N.B. :- Results to be observed on the subsequent day]

OR

Estimate the amount of carboxyhaemoglobin/Paracetamol/salicylic acid/Glycosylated haemoglobin from the human blood provided.

OR

Estimate salt loss and salt gain by fish provided when it is transferred to a salt free medium and to natural medium respectively.

OR

Determine the amount of oxygen consumed by the animal provided and calculate the R.Q.

OR

Determine the level of activity of acetyl-cholinesterase from the specimen provided.

Q3. ***Viva-voce*** 10

Q4. Journal 05

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII & VIIi (Animal Physiology)

Duration: 5Hrs (with additional 30 min lunch break) Marks: 50

Dav II

1. **Major Question:** 20

Set up an experiment to demonstrate the effect of decreasing PO_2 of water on the respiratory rate of a fish by counting opercular movements. Estimate the lactate content from the muscle of the fish exposed to decreased PO_2 of water for a known period of time and compare it with that of a control fish.
Tabulate the readings and submit a report.

OR

Fish exposed to sublethal ambient Ammonia for 3/5/7/15 days and a control fish have been provided to you. Estimate the following parameters and explain the results obtained to show the effect of exposure of the fish to sublethal ambient Ammonia.
(a) The level of excretory ammonia and amino acid content of the gills.

OR

(b) The level of hepatic glutamate dehydrogenase.

OR

(c) The level of brain glutamine synthatase.

OR

(d) The level of amino acid in the brain/liver/muscle.
Submit a report.

OR

Of the two specimens (rat/mice) provided to you, one (marked) has been administered CCl_4. Estimate the following parameters and compare the results with that of the control provided. Submit a report on the toxicity of CCl_4 in the light of the results obtained.

(a) The FFA content of liver and the plasma.

OR

(b) The hepatic content of FFA and total lipids.

OR

(c) The level of hepatic AST and ALT.

OR

(d) The level of hepatic ALP and ACP.

OR

(e) The level of hepatic LDH and SDH.

2. Project 15

3 *Viva-Voce* 10

4 Journal 05

5

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII (Oceanography, Fishery Science, Aquaculture)

Duration: 5Hrs (with additional 30 min lunch break) Marks: 50

Q1.	Estimate _____ from the given water sample ($D.O./NO_3$-N/SiO_3/Zinc/Copper/Lead/Primary Productivity	07
Q2a.	Estimate _____ of the sample water (Salinity/Carbon-dioxide/Phosphate-phosphorus)	05
Q2b.	Make temporary mountings of Foraminiferans and Radiolarians from the sample provided.	04
	Or	
	Analyse and make a report of the gut contents of the fishes provided.	
Q3.	Identification [3-Oceanographic instruments, 3-intertidal organisms (2marks each) 1-craft, 1-net (1 mark each)]	14
Q4.	*Viva-voce*	10
Q6.	Journal	10

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VIII (Oceanography, Fishery Science, Aquaculture)

Duration: 5Hrs (with additional 30 min lunch break) **Marks: 50**

Q1. Identify and assign the given fishes and prawn to their respective genera And species 15
[1-fish with Day's volume (5 marks), 2-fishes without Day's volume (3 marks each), 1-prawn (4 marks)]

Q2a. Identify and make temporary mounting of at least 5 different planktonic forms. 05

Or

Measure the ova diameter and plot a frequency polygon for the given fish.

Or

Estimate the fecundity of the given fish.

Or

From the data provided present an account of biometric parameters of the given fish.

Q2b. Demonstrate the culinary expertise on pickle making 05

Or

Estimate quantitatively the density of the planktonic sample by a suitable method.

Q3. Identification 05
(1-Alga, 1-fouler or borer, 1-freshwater fish, 1- from Molluscan fishery, 1- from Crustacean fishery)

Q4. *Viva-voce* 10

Q5. Journal, Herbaria & Plankton submission 10

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII & VIII (Endocrinology)
(Two Days)

Duration: 5Hrs (with additional 30 min lunch break) **Marks: 100**

Day I

Q1. Perform the ectomy in a suitable animal (rat/mice) and show the results to the examiners. (Thyroid/Adrenal/Ovary/Testis) 15

Q2. Demonstrate the effect of insulin administration on the blood sugar level/ hepatic glycogen in mice/rat. 10

Or

Q2. Demonstrate the effect of epinephrine administration on the blood sugar level/hepatic glycogen in mice/rat. 10

Q3. Estimate adrenal ascorbic acid/adrenal cholesterol in normal animal (mice/rat)/ treated animal with ACTH/Epinephrine. 10

Or

Q3. Dissect and localize the endocrine glands in suitable animal (mice/rat). 10

Or

Q3. Demonstrate the Hypophysectomy in fish Tilapia/catfish. 10

Q4. *Viva-voce* 10

Q5. Journal 05

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII & VIII (Endocrinology)
(Two Days)

Duration: 5Hrs (with additional 30 min lunch break)

Day II

Q5.	Perform the paper chromatographic separation of corticoids/ gonadal hormones.	10
Q6.	Dissect the male/female reproductive system of the given animal. (rat/mice)	10
Q7.	Prepare the vaginal smear and identify the stage in the estrous cycle of the given animal.	05
	Or	
Q7.	Perform the ELISA on the given hormone.	05
Q8.	Analyse the semen and show the results to the examiner.	10
	Or	
Q8.	Process the given tissue sample/blood sample/slide to evaluate the development of polycystic ovary in rat.	10
Q9.	Submission of permanent slides.	05
Q10.	*Viva-voce*	10

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII & VIII (Entomology)
(Two Days)

Duration: 5Hrs (with additional 30 min lunch break) **Marks: 100**

Day I

Q1. Dissect cockroach/honeybee so as to expose endocrine glands/ stomatogastric nervous system/ nervous system/ air sacs. 10

Q2. Dissect cockroach/ grasshopper/ housefly/ butterfly so as to expose its digestive/ reproductive system 06

Or

Q2. Make a temporary preparation from cockroach/ butterfly:
a. Sclerites of head / thorax and abdomen 03
b. Mouth parts / salivary glands /spiracles / genitalia 03

Q3a. Identify and classify upto family giving reasons. Specimen A – C 12

Q3b. Identify sketch and label D&E
(wing venation / histology of digestive tract / endocrine gland)

Q3c. Carry out a bioassay of the given insecticide on a suitable insect. 07

Or

Q3c. Find out LC_{50} of 24 hrs of the given insecticide on a suitable insect. 07

Or

Q3c. Determine the synergistic ratio of an insecticide and given compound. 07

Q4. *Viva-voce* 10

Q5. Journal 05

10

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University Of Mumbai
M.Sc. (Part II) Zoology Examination (Revised Course)
Practical VII & VIII (Entomology)
(Two Days)

Duration: 5Hrs (with additional 30 min lunch break)

Day II

Q6. Identify and describe the economic importance and control measures of the specimens A – F 12
(4 pests of crops, 1 insect of medical importance and 1 veterinary pest)

Q7. Perform the physiological experiment and make a report. 07
(to detect the presence of chitin / digestive enzymes of salivary glands/ study of heart beat in cockroach/ differential and total haemocyte count/ analysis of haemolymph amino acids by TLC / two dimensional chromatography / study of rate of respiration in cockroach)

Q8. Identify the following specimens and comment on economic or ecological importance. 04

(galls / pathogens from given insect / symbionts from termites/ caste system fro n termites)

Q9. *Viva-voce* 10

Q10. Submission
- a) Report on sericulture / apiculture / lac culture 03
- b) Report of Drosophila culture 06
- c) Preserved Insect specimens 03
- d) Journal 05

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