

2ND YEAR PUC PRACTICAL EXAMINATION

SUBJECT: BIOLOGY (36)

EXPERIMENTS TO BE CONDUCTED IN PRACTICALS FOR THE YEAR 2023-24

Exercise 01: To study the reproductive parts of commonly available flowers

Exercise 02: To calculate percentage of pollen germination.

Exercise 03: To study pollen tube growth on stigma.

Exercise 04: To study the discrete stages of gametogenesis in mammalian testis and ovary

Exercise 05: To study and identify various stages of female gametophyte development in the ovary of a flower

Exercise 06: Preparation and study of mitosis in onion root tips

Exercise 07: Study of stages of meiosis using permanent slides

Exercise 08: To study the blastula stage of embryonic development in mammals, with the help of permanent slide, chart, model or photograph

Exercise 09: To verify Mendel's Law of Segregation

Exercise 10: To verify the Mendel's Law of Independent Assortment

Exercise 11: Preparation and analysis of Pedigree Charts

Exercise 12: To perform emasculation, bagging and tagging for controlled pollination

Exercise 13: Staining of nucleic acid by acetocarmine

Exercise 14: To identify common disease-causing organisms and the symptoms of the diseases

Exercise 15: To study the texture of soil samples

Exercise 16: To determine the water holding capacity of soils

Exercise 17: To study the ecological adaptations in plants living in xeric and hydric conditions

Exercise 18: To study the adaptations in animals living in xeric and hydric conditions

Exercise 19: To determine the pH of different water and soil samples

Exercise 20: To analyse living organisms in water samples

Exercise 22: To determine the amount of Suspended Particulate Matter (SPM) in air at different sites in a city

Exercise 23: To study plant population density by quadrant method

Exercise 24: To study plant population frequency by quadrant method

Exercise 25: Study of homologous and analogous organs in plants and animals

Investigatory Project Work

2ND YEAR PUC PRACTICAL EXAMINATION
SUBJECT: BIOLOGY (36)
QUESTION PAPER

TIME: 2 HOURS

MAXIMUM MARKS: 30

1. Prepare a temporary slide to show pollen germination from the given material **"A1"** and calculate the percentage of pollen germination.

OR

Prepare a temporary slide to show pollen tube growth on the stigma from the given material **"A2"** and draw a labeled diagram of your observation.

OR

Prepare a temporary slide of given material **"A3"** by taking a transverse section of ovary and report the number of locules and type of placentation.

OR

Prepare a temporary slide to show nucleic acid staining from the given material **"A4"** and report the shape of the cell and number of nuclei observed. **5 marks**

2. Prepare a temporary slide of the given material **"B"** and identify any one stage of mitosis and comment on the stage observed. **5 marks**

3. Identify and comment on the given pedigree chart **"C"**. **3 marks**

4. Identify **"D"** and comment. **3 marks**

5. Identify **"E"** and comment. **2 marks**

6. Identify **"F"** and comment. **2 marks**

7. Viva voce **4 marks**

8. Practical Records **6 marks**

2ND YEAR PUC PRACTICAL EXAMINATION
SUBJECT: BIOLOGY (36)
SCHEME OF EVALUATION

2023-24

TIME: 2 HOURS

MAXIMUM MARKS: 30

QUE.NO	SUBJECT	SCHEME OF EVALUATION	NOTE TO EXAMINERS
1*	Pollen germination experiment	Preparation of the slide 3 marks	<p>* Any one of the experiments to be performed by the student on the basis of selection by lottery system. Of the four experiments, one will be selected by each student.</p> <p>All the materials for each and every experiment should be made available for the student.</p> <p>Only raw material has to be provided. Conduction of experimental procedures such as sectioning, staining, slide preparation, etc., should be done by the student only, wherever necessary.</p>
		Calculating the % pollen germination 2 marks	
	Pollen tube growth on stigma experiment	Preparation of the slide 3 marks	
		Labeled diagram 2marks	
	Transverse Section of ovary	Preparation of the slide 3 marks	
		Reporting the number of locules in ovary 1 mark	
		Reporting the type of placentation 1 mark	
	Nucleic acid staining experiment	Preparation of the slide 3 marks	
		Reporting the shape of the cell- 1 mark	
		Reporting the number of nuclei 1 mark	
2	Prepare a temporary mount of onion root tip to study mitosis.	Preparation of the slide 3 marks	<p>Note: Root tip should be provided to the student. Processing of root tip such as treatment, staining, slide preparation etc., should be done by the student only.</p>
		Identifying any one stage 1 mark	
		Commenting on the stage observed 1 mark	
3	Pedigree Chart	Identification of type pedigree* 1 mark	<p>Pedigree chart analysis</p> <p>One of the Pedigree charts prepared during practical classes is to be given.</p> <p>*Autosome Linked Dominant traits</p>
		Comments 2 marks	

			*Autosomal Recessive traits *X-linked Dominant traits *X-linked Recessive traits *Y-chromosome linked traits
4	Identification and commenting	Identification 1 mark	One of the following has to be given for question no.4 Slide showing T.S of testis/ T.S of ovary/ V.S of ovary showing female gametophyte/V.S of blastula. (If the slides are not available, then only suitable photograph/model that were shown in the practical classes can be given for identification and commenting)
		Comments 2 marks	
5	Identification and commenting on the disease causing organisms	Identification with its scientific name 1 mark	One of the following has to be given for question no.5 <i>Common disease causing organisms like Ascaris, Entamoeba*, Plasmodium*, Ring-worm fungus(Trichophyton rubrum*) through permanent slides, models or virtual images or specimens.</i> (If the slides* are not available, then only suitable <i>models or virtual images or specimen</i> that were shown in the practical classes can be given for identification and commenting).
		Comments 1 mark	
6	Identification and commenting	Identification 1 mark	One of the following has to be given for question no.6 i) Controlled pollination - emasculation, tagging and bagging ii) Homologous and analogous organs 1. Homologous Organs in Plants (i) Tendrils of passion flower and thorns of pomegranate (ii) Tendrils of <i>Vitis</i> and thorns of <i>Carissa</i> (iii) Tendrils of balloon vine (<i>Cardiospermum</i>) and bulbils of <i>Agave</i> . (iv) Scale leaves of onion and spines of prickly pear (<i>Opuntia</i>) 2. Analogous Organs in Plants (i) Stem tendrils and leaf tendrils (ii) Thorns and spines
		Comments 1 mark	

			(iii) Modified underground stems and modified roots (iv) Phylloclade, cladode and leaves 3. Homologous Organs in Animals Wings of birds, and forelimb of mammals/reptiles/frog: All have the same bony elements (humerus, radio-ulna, carpals, metacarpals and phalanges), but perform different (flying in birds, for holding or walking etc. in other) functions. 4. Analogous Organs in Animals (i) Wings of dragonfly/cockroach/butterfly and of birds. (ii) Mandible of cockroach and mandible (lower jaw) of a vertebrate. *(If the specimens not available, then only Flash cards /specimen/models showing examples of can be given for identification and commenting)
7	Viva Voce	4 marks	Questions pertaining to the experiments given in that particular batch of practical exam only to be asked. Viva Voce should be conducted in the presence of both external and internal examiner.
8	Practical record	6 marks	Refer the table below*

***Marks to be allotted to practical record**

Sl.No	No. of experiments to be performed and recorded	Maximum Marks
1	Less than 75% of exercises	Not eligible
2	75% to 79% of exercises*	3
3	80% to 84% of exercises*	4
4	85% to 89% of exercises*	5
5	More than 90% of exercises*	6
*Investigatory projects must be considered for evaluation.		