



*Volume 2 (2024)*

# *Synapse*



*Newsletter Published by Zoological Society*

*RGGC, Chaura Maidan, Shimla-4*

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*Published Annually*

*Published in October, 2024*

*Chief Patron*

*Principal, RGGC*

*Coordinators: Faculty of Zoology*

## **Zoological Society for the Session 2023-24**

1.	Prathik Negi	B.Sc III	Vice – President
2.	Siddhant	B.Sc II	General Secretary
3.	Megha	B.Sc II	Executive Member
4.	Neeraj	B.Sc III	Executive Member
5.	Anita	B.Sc III	Executive Member
6.	Shagun	B.Sc III	Executive Member
7.	Nikhil Patyal	B.Sc II	Executive Member
8.	Tanzin Pember	B.Sc II	Executive Member
9.	Gaurav Gaunta	B.Sc II	Executive Member
10.	Nikhil Thakur	B.Sc II	Executive Member
11.	Ankit Shandil	B.Sc I	Executive Member
12.	Ranjana	B.Sc I	Executive Member
13.	Anshul	B.Sc I	Member
14.	Smriti	B.Sc II	Member
15.	Vinay Thakur	B.Sc II	Member
16.	Khushbu	B.Sc II	Member
17.	Sanjana Thakur	B.Sc I	Member
18.	Neha	B.Sc I	Member
19.	Drishti Kaushal	B.Sc I	Member
20.	Sahil Thakur	B.Sc I	Member

### **Vice-President's Note**

***“Education is the most powerful weapon we can use to change the World.”***

***Nelson Mandela***

***It's a privilege to present to you the second volume of 'Synapse', the departmental newsletter, as an outcome of the hard work put together by the entire department. I would hereby also like to thank the members of the society for constantly putting in the efforts and dedication throughout the year. Further, I especially congratulate the editorial team members to design and curate the newsletter with their hard work and creativity. Human curiosity, the urge***

*to know is the powerful force and is perhaps best secret weapon of all struggles to unravel the working of natural world. Our inquisitiveness can be promulgated as unique isomorphism of SCIENCE. The realm of Zoology is an endless source of fascination and discovery, where each species, each adaptation, and each ecosystem tells a unique and awe-inspiring story. On behalf of the entire society, I would like to extend my heartfelt gratitude to our teaching faculty for the impeccable support and guidance throughout the year. Further, I extend my thanks to helpful lab staff and my amazing team of young, creative, enthusiastic, and extremely talented office bearers and volunteers for their involvement and willingness to take on the completion of tasks beyond their comfort zones.*

**PARTHIK NEGI**

### *Editorial Team*

*Smriti (Student Editor)*

*Takeshwar Thakur (Designing & Article Section)*

*Megha (News Section)*

*Nikhil Thakur (Quiz Section)*

### *Editor's Note*

*It is an honour for me to present the latest issue of 'Synapse', the departmental newsletter. I would like to thank the members of the society for constantly putting their efforts and investing their precious time the year around. As we delve into the fascinating world of animals and the nature, this issue brings forth an array of captivating stories, insightful research and stunning visuals. Our team of*

*dedicated students and faculty members has worked tirelessly to curate content that showcases the diversity and complexity of Zoological Sciences. As Zoology students, we recognize the importance of sharing knowledge, sparking curiosity and inspiring action. The newsletter serves as a platform for our department's vibrant community to share ideas, explore new perspectives and celebrate the wonders of the animal kingdom.*

*So be the part of this experience and we hope you enjoy this issue and join us in our mission to explore, educate and conserve.*

*Smriti*

## ***News Highlights during the Year***

### ***The Nobel Prize in Physiology or Medicine 2024***

*The Nobel Prize categories are physics, chemistry, physiology or medicine, literature and peace and were laid out in the will of Alfred Nobel in 1901*



*Victor Ambros and Gary Ruvkun were awarded Nobel*

*Prize in Physiology or Medicine category for the year 2024 for their discovery of microRNA, a new class of tiny RNA molecules that play a crucial role in gene regulation. MicroRNAs are proving to be fundamentally important for how organisms develop and function.*

*Source: <https://www.nobelprize.org/prizes/medicine/>*



## *Bald Ibis has made a comeback*



*Geronticus eremita*, Northern Bald Ibis has made a comeback after 300 years of extinction in Europe. The species that was believed to exist only in drawings was listed as critically endangered which later changed to endangered in 2018 as per IUCN. The birds raised in captivity and lacking the

knowledge, are taught to migrate by following a tiny micro craft. Extinct in central Europe for 300 years, 36 northern bald ibis are following an ultra light aircraft on their long forgotten migration route from Australia to Spain.

(Source: <https://timesofindia.indiatimes.com/h>  
<https://www.theguardian.ct/article/2024>)

## *ZSI Scientists' Discovery: A New Species of Frog from Arunachal Pradesh*

Scientists discovered new horned frog species in Arunachal Pradesh mistakenly identified as Vietnamese reptile earlier. Geographic distance and genetic diversity helped identify the species as unique. Researchers from the Zoological



Survey of India (ZSI) in Shillong and Pune, identified the new species as *Xenophrys apatani*.  
(Source:<https://www.downtoearth.org.in/wildlife-biodiversity/scientists>)-

### ***Himalayan Wolf listed as Vulnerable in Red Data List***



*The Himalayan wolf was recently classified as vulnerable in the IUCN Red List of*

*Threatened Species, with only 2,275 to 3,792 individuals left in the wild. The IUCN lists several threats to the subspecies, including habitat loss or modification, depredation conflict, depletion of wild prey, hunting for illegal wildlife trade, persecution for preying on livestock and hybridisation with increasing population of feral dogs or free-ranging dogs in India, especially in Ladakh and Spiti.*

(Source:<https://india.mongabay.com/2024/02>)

### ***Beekeeping: A Sustainable and Profitable Alternative for Farmers***

*A progressive farmer, Jagpal Singh Phogat, from Uttar Pradesh's Chitrakoot district has mastered the skill of beekeeping as one of the profitable and sustainable alternative for farmers, offering increased income through*

*honey production and pollination, while promoting environmental conservation and revitalizing rural economies across India. By producing honey, wax, and other by-products, beekeeping increases farmers' revenue and enhances*

crop pollination, boosting agricultural productivity and supporting environmental sustainability. Jagpal's journey is a testament to the profitability of beekeeping. "Personally, my turnover was Rs 1.5 crores last

I have a team of over 30 people who work with me in these states. A small farmer like me, with just 2.5 acres of land, can make Rs 1.5 crores a year, which proves how profitable bee farming is," he shares.

year. I am doing bee farming in Jammu, Haryana, Rajasthan, and Uttar Pradesh. I deploy bee boxes in these states, and all of these boxes give me additional income.



(Source: <https://krishijagran.com/success-story/beekeeping-journey-of-jagpal-singh>)

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## Articles

### **Pollination Ecology And Bee Conservation**

Pollination ecology is a field that studies the relationships that exist between plant and their pollinators. Such relationships play an important

role in biological diversity and food production. Bees, which are most important among other pollinators, assist in the fertilization of Flowering plants. This leads



to the production of fruits and seeds which are consumed by many species across the globe including animals. Bees play an important role in pollinating

and hence in 1/3rd of our global food production. In consideration to these facts, one of the biggest challenges of pollination ecology is the decline of bee populations.

### ***Bee populations decline is due to:***

- *Habitat loss*
- *Pesticide use*
- *Climate change*
- *Diseases*

### ***Conservation Strategies***

- ✓ *Habitat restoration*
- ✓ *Pollinator-friendly environments*
- ✓ *Public education*
- ✓ *Promoting native flowering plants*



*(Image Source: <https://www.mdpi.com>)*

*By protecting bee populations, we safeguard the ecological balance and ensure sustainable foodsystem. By preserving this vital link, we ensure the long term health of our planet.*

*[Source: Food and agriculture organization (FAO) of UN;Intergovernmental science-policy platform on biodiversity and ecosystem services (IBPES)]*

***Takesheshwar Thakur***  
***(B.Sc III Year)***

## ***The Science of Sleep: Why Rest is Essential for Our Well-Being?***

*Sleep, often regarded as a passive state, is actually a dynamic process that plays a critical role in our physical and mental health. While we sleep, our brain is hard at work, consolidating memories, regulating emotions, and rejuvenating our bodies. In this article, we'll explore the latest research on sleep patterns, dreams, and the importance of a good night's rest.*

*Our brains go through five stages of sleep and each stage has distinct brain wave patterns. The first stage is the lightest, while the last stage of the sleep is the deepest, where our brain waves slow down, and we become less responsive to our environment. Research suggests that sleep serves multiple purposes such as memory consolidation; sleep helps strengthen memories and transfer them from short-term to long-term storage. Further, sleep helps to regulate emotions and reduces stress as well as anxiety. Our body regenerates and repairs damaged cells while we are sleeping.*

*In our sleep, we also experience dreams. Although a universal human phenomenon, yet the concept of dreams is poorly understood. Theories range from Freud's psychoanalytic interpretations to modern neuroscience's view of dreams as a byproduct of brain activity during sleep.*

*Sleep deprivation is a hidden epidemic in the modern day world. With increasingly demanding schedules, many of us sacrifice sleep for productivity. However, chronic sleep deprivation can lead to impaired cognitive function, mood disorders, and increased risk of chronic diseases. Sleep is not just a passive state; it's an essential component of our overall well-being. By prioritizing sleep and creating healthy sleep habits, we can improve our physical and mental health, leading to a happier, healthier life.*

### ***References:***

- <https://sleep.hms.harvard.edu/education-training>
- [sleepfoundation.org/how-sleep-works](https://sleepfoundation.org/how-sleep-works)

***Kamlesh Rana  
(BSc III Year)***

## ***Managing High Blood Pressure***

*Blood pressure (BP) refers to the force exerted by circulating blood on the walls of blood vessels as it is pumped by the heart. Blood pressure is typically measured in millimeters of mercury (mmHg) and recorded as two numbers; Systolic Pressure is the pressure in your arteries when your heart beats (contracts) and pumps blood and Diastolic Pressure; the pressure in your arteries when your heart is resting between beats. A normal reading might be 120/80 mmHg, where 120 is the systolic and 80 is the diastolic pressure. Hypertensive crisis occurs when Systolic pressure increases above 180 mmHg and/or Diastolic rises above 120 mmHg and that requires immediate medical attention. High blood pressure readings or symptoms like severe headaches, chest pain, difficulty in breathing, or vision problems need medical intervention. Several factors can affect blood pressure, including, family history, age, obesity, high salt intake, stress, smoking etc. High salt intake, excessive alcohol consumption, and a diet low in potassium can lead to elevated blood pressure. Chronic stress*

*and smoking tobacco can damage blood vessels raising blood pressure. Certain medical conditions diabetes, kidney disease, and high cholesterol can impact blood pressure. Maintaining normal blood pressure is critical because prolonged high blood pressure (hypertension) can lead to serious health problems, including heart disease leading to conditions like heart attack and heart failure, brain stroke, kidney damage. The kidneys are sensitive to changes in blood pressure, and hypertension can lead to kidney disease, damage to blood vessels of eyes thereby leading to vision issues or blindness. To keep blood pressure within a healthy range, one should follow a healthy life style such as eating a balanced diet with less salt, rich in fruits, vegetables, whole grains, and lean proteins. The DASH (Dietary Approaches to Stop Hypertension) diet is commonly recommended. Exercise for at least 150 minutes of moderate-intensity aerobic exercise, such as brisk walking, per week. Maintain a healthy weight and limit alcohol and caffeine. In order to manage stress, practice*

yoga, meditation, or deep breathing daily for at least half an hour. Quitting smoking can

significantly improve your blood pressure and overall health.

*“Regularly check your blood pressure to catch any changes early. If you experience consistently high BP, it's important to seek medical attention immediately.”*

*Reference: A.K. Berry (1981). A Text Book of Biochemistry and Animal Physiology; Publishers: Emkay Ankit Shandil*

*BSc II Year*

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### ***Sericulture: Perspectives of Employment for Rural Youth***

Sericulture or silk farming is the process of cultivating silkworms and obtaining silk from them. The word Sericulture is derived from the Greek word ‘Sericos’ which means ‘silk’. SILK called as Queen of Textiles, embraces luxury, elegance, class and comfort. Sericulture is a very important agro-based rural industry increasing rapidly in India, which has the potential to generate high income for small and marginal farmers.

Sericulture includes domesticating the caterpillars of Silk moth, *Bombyx mori* which yields mulberry silk. Other silkworm species yield Eri, Muga, and Tasar silks that are wild or semi-domesticated called Vanya Silk.

The sericulture process involves Mulberry leaf farming, silkworm rearing, and cocoon reeling to obtain silk thread, and weaving to convert the yarn to clothes at large scale. Different countries’ domestic industries depend heavily on sericulture occupation. Furthermore, India and China are the biggest silk manufacturers globally accounting for more than 60% of the global production. In India, major silk-producing states are Assam, Punjab, Kashmir and Karnataka where Karnataka is the largest producer state. The total Silk production in India is approximately 2969 turns per year and India ranks 3rd in the production of silk globally.

Sericulture is an agro-based domestic industry with high



potential for employment and higher income generation. It is a budget-friendly occupation for small and marginal farmers offering better returns. Silk is an expensive product used mostly by wealthy societies, therefore, transfer of money from rich to poor is guaranteed. Sericulture offers self-employment opportunities to educated unemployed youth in different sectors. Many by-products can also be produced from sericulture activities. Moreover, Mulberry and silkworm have pharmaceutical values in the world. All the sericulture activities are village-based and hence prevent the migration of people from rural to urban areas in search of jobs. Further, it's a woman-friendly industry and thus plays a vital role in rural woman empowerment where 60% of sericulture employees constitute women folk.

The sericulture involves less

maintenance and huge returns. Sericulture can generate vast employment and is used as a tool for rural economic reconstruction. It is estimated that about 57% of the gross value of silk fabrics flows back to cocoon growers.

In India, it is the best Occupation for the Weaker Section of the Society like Low landholders. Silkworm rearing on 3/4 acres of land can support a family of three without hiring outside labor. Sericulture contributes to Soil preservation, Manures, Fuel sources, Pollution control and integrated farming.

#### **References:**

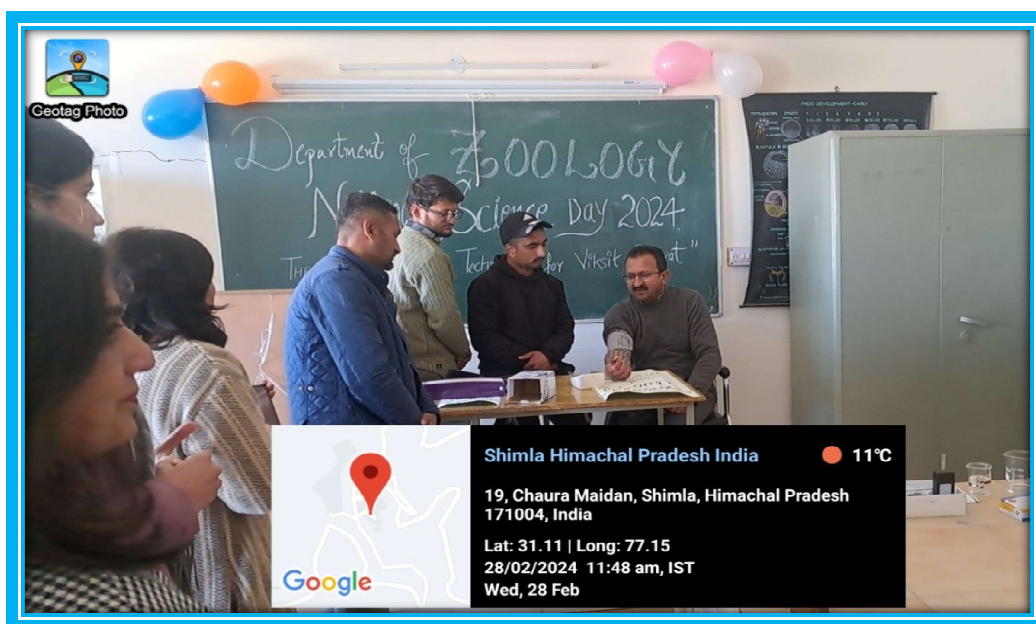
- <https://www.linkedin.com/pulse/importance-sericulture-senthil-kumar>
- <https://www.ignfa.gov.in/document/biodiversity-cell-ntfp-related-issues4.pdf>

**Tanzin Pember**  
**BSc III Year**

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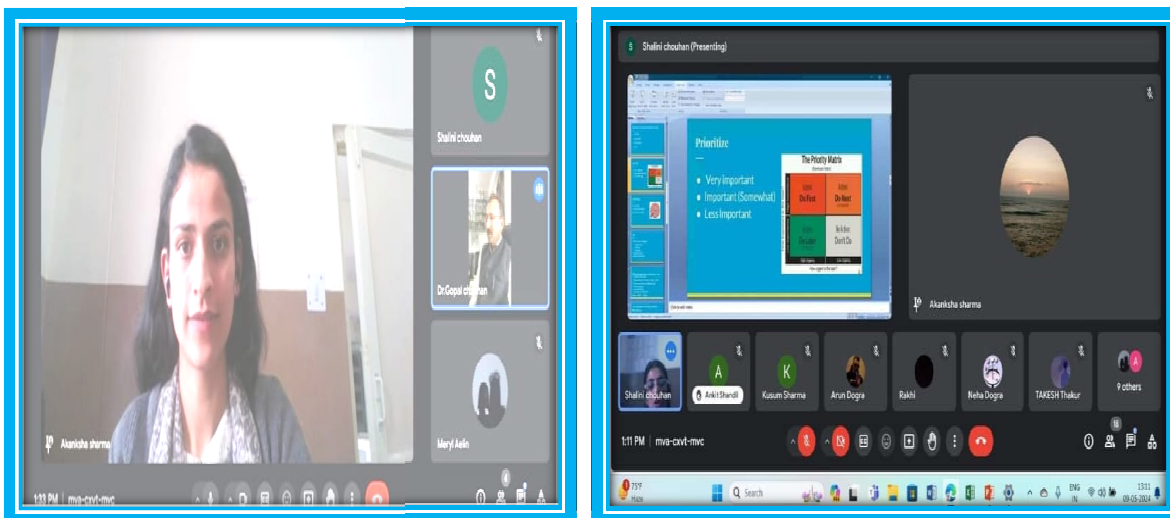
### ***Departmental Activities***

- *The students from the department of Zoology completed online course on “Non-Communicable Diseases” from Swayam Portal. Total ten students were enrolled in the month of October, 2023.*
- *National Science Day was on 28<sup>th</sup> February, 2024. The students from department of Zoology showcased an exhibition in the department.*



*Students measuring the Blood Pressure of Principal, Dr Gopal Chauhan using Sphygmomanometer (BP*

*An online career counseling Session was organized on 9<sup>th</sup> May, 2024*

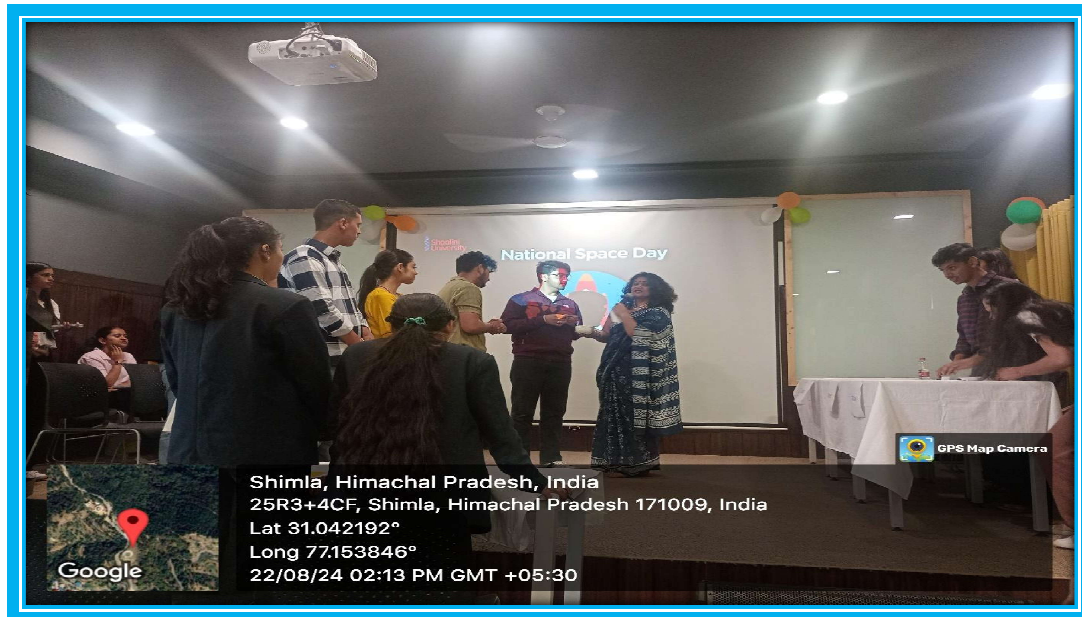


*Visit to Himalayan Bird Park at Chaura Maidan (Shimla) on 23<sup>rd</sup> August, 2024*

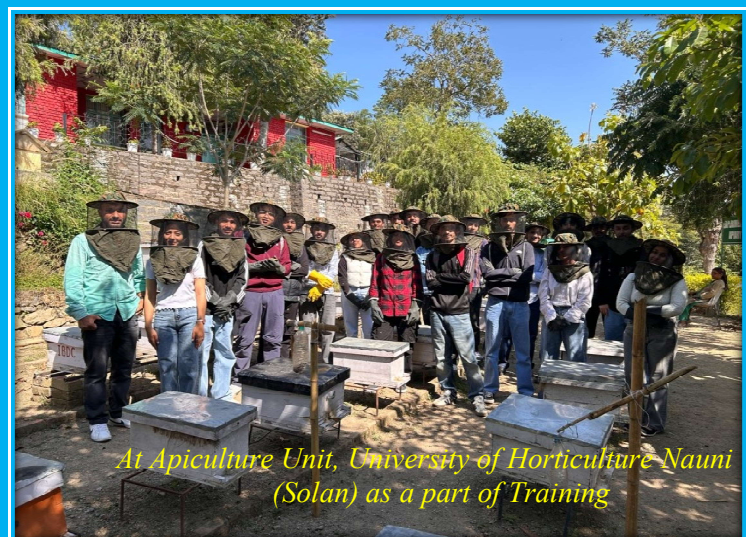




***Participation in National Space Day organized by HIMCOSTE at Centre for Science Learning and Creativity, Anandpur, Shoghi (Shimla) on 22<sup>nd</sup> August, 2024***



***A Five Day Training on Beekeeping (23<sup>rd</sup> September-28<sup>th</sup> September, 2024 at Directorate of Horticulture, Nav Bahar, Shimla)***



## *Brain Storming*

1. Main function of large intestine is
  - a) Consolidation of faeces
  - b) Absorption of water
  - c) Both (a) and (b)
  - d) None.
2. Gall bladder releases bile juice after stimulation from
  - a) Anterocrinin
  - b) Villikinin
  - c) Cholecystokinin
  - d) Brunner's gland
3. What is the proportion of water in plasma part of blood
  - a) 70%
  - b) 75%
  - c) 80%
  - d) 90%
4. Vitamin responsible for blood clotting is
  - a) Vitamin A
  - b) Vitamin B
  - c) Vitamin C
  - d) Vitamin K
5. Which of the following organisms is an anaerobe ?
  - a) *Fasciola hepatica*
  - b) *Pheretima posthuma*
  - c) *Pila globosa*
  - d) *Periplanata americana*
6. Requirement of H<sub>2</sub>O is maximum for excretion of
  - a) Ammonia
  - b) Urea
  - c) Uric acid
  - d) Same for all excretory products
7. Which blood vessel forms the afferent arteriole that enters glomerulus?
  - a) Renal artery
  - b) Inter tubular artery
  - c) Arcuate artery
  - d) Arcuate vein.
8. Which of the following is/are involuntary muscles ?
  - a) Skeletal
  - b) Smooth
  - c) Cardiac
  - d) Both (b) and (c)
9. Intercalated disc and syncytium develop in
  - a) Skeletal
  - b) Smooth
  - c) Cardiac
  - d) Both (b) and (c)
10. H zone or Hele's zone or Hensen's zone is present in middle of
  - a) Isotropic band
  - b) Anisotropic zone
  - c) Z-line
  - d) Both (a) and (b)
11. Madcow disease is caused by
  - a) Bacterium
  - b) Virus
  - c) Viriod
  - d) Prion
12. Select a virus-borne zoonotic diseases:
  - a) Ebola
  - b) SARS-CoV-2
  - c) Swine flu
  - d) All of these
13. Tuberculosis is caused by a bacterium of genus :
  - a) *Mycobacterium*
  - b) *Lactobacterium*
  - c) *Streptobacterium*
  - d) *Phycobacterium*
14. Pulmonary TB is diagnosed by :
  - a) Widal test
  - b) Spasmodic contraction of muscles
  - c) Western blot test
  - d) Mantoux test
15. Monocytes differentiates into which kind of phagocytic cells :
  - a) Neutrophil
  - b) B cell
  - c) Macrophage
  - d) T cell
16. Most common mosquito-borne disease is :
  - a) Dengue
  - b) Malaria
  - c) Chikungunya
  - d) Yellow fever

17. Sleeping sickness disease is caused by :

- a) *Trypanosoma*
- b) *Leishmania*
- c) Sand fly
- d) Tse-tse fly

18. Life cycle of *Entamoeba histolytica* :

- a) Monogenetic
- b) Digenetic
- c) Dimorphic
- d) Both (a) and (c)

19. Hind wings of mosquitoes are modified into :

- a) Halteres
- b) Elytra
- c) Hemelytra
- d) Dipteral

20. In cryopreservation, semen of male is stored in :

- a) Refrigerator
- b) Liquid nitrogen
- c) Solid ice
- d) Liquid ammonia

***Meritorious Students of the Department(2023-24)***



***DIXANT MOUDGIL (Batch2022-24) Ist in College Merit List, Pursuing MSc (Botany) from Banaras Hindu University***



***PRAVEEN SHARMA IInd in College Merit List(IInd in Zoology DSC)***



***ANITA (Batch 2022-24) III in College Merit List (Batch 2022-24)***



***ANAND SAGAR (Batch 2022-24) Ist in Zoology (Sec) Pursuing MSc (Nuclear Medicine)from Panjab University***



***PARTHIKNEGI (Batch2022-24) IInd in Zoology(SEC) Pursuing MSc (Zoology) from DAV PG College Dehradoon***



***Answer Key:***

1	2	3	4	5	6	7	8	9	10
c	c	d	d	a	a	a	d	c	b
11	12	13	14	15	16	17	18	19	20
d	d	a	d	c	a	a	d	a	b

***For any feedback/comments kindly mail at:***  
***[zoologydeptkotshera@gmail.com](mailto:zoologydeptkotshera@gmail.com)***