

**FACULTY OF SCIENCE****B.Sc. (CBCS) III - Semester Examination, November/December 2024****Subject: Zoology****Paper – III : Animal Physiology and Animal Behaviour****Time:3 Hours****Max. Marks: 80****PART – A****Note : Answer any Eight questions.****(8x4=32 Marks)**

1. Holoenzyme
2. Malpighian capsule
3. Chloride cells
4. Thermoregulation
5. Bohr's effect
6. Neurogenic heart and Myogenic heart
7. Sarcomere
8. Neurotransmitters
9. Adrenal gland
10. Imprinting
11. Pheromones
12. Circadian rhythm and Circannual rhythm

**PART – B****Note : Answer all the questions.****(4x12=48 Marks)**

13. a) Give detail account of carbohydrate digestion.

**OR**

- b) What is the counter current mechanism and how it helps to form the concentrated urine in mammalian kidney.

14. a) Explain the transportation of oxygen and oxygen dissociation curve.

**OR**

- b) Describe the structure of mammalian heart with neat labelled diagram.

15. a) What is nerve impulse and explain the stages of nerve impulse.

**OR**

- b) Describe the structure, secretions and functions of pituitary gland.

16. a) Discuss about the Pavlov's experiment of classical conditioning.

**OR**

- b) Explain the social organization in honey bee and add a note on its importance.

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**FACULTY OF SCIENCE****B. Sc. (CBCS) III – Semester Examination, November/December 2024****Subject: Physics****Paper – III : Electromagnetic Theory****Time: 3 Hours****Max. Marks: 80****PART – A****Note: Answer any eight questions.****(8 x 4 = 32 Marks)**

1. Obtain the relation between Electric field (E) and Electric potential (V).
2. Deduce equation for potential energy of a system of charges.
3. Explain the conservative nature of Electric field (E).
4. Write the applications of Ampere's Law.
5. Apply Ampere's law to calculate the field due to a straight conductor.
6. Derive the energy stored in magnetic field.
7. What is displacement current? Explain.
8. Define coefficient of Self-inductance.
9. Obtain an expression for Poynting vector.
10. Write a short note on Q-factor.
11. Discuss the growth of charge in C-R circuit.
12. What are active and passive elements?

**PART – B****Note: Answer all the questions.****(4 x 12 = 48 Marks)**

13. (a) State and prove Gauss's law in electrostatics. Calculate the Electric intensity due to uniformly charged sphere.  
(OR)  
(b) Define Electric Potential. Obtain an expression for the Electric potential due to a line Charge of infinite length.
14. (a) Explain Biot-Savart law. Calculate the magnetic field induction (B) inside a long Solenoid carrying current.  
(OR)  
(b) Explain the construction and working of Ballistic Galvanometer.
15. (a) State and explain differential and integral forms of Faraday's laws of electro Magnetic induction.  
(OR)  
(b) Explain Maxwell's equation in vacuum and dielectric medium.
16. (a) Give the detailed theory of L-C-R series circuit carrying AC and explain the resonance condition.  
(OR)  
(b) State and prove the Maximum power Transfer Theorem.

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**FACULTY OF SCIENCE**

**B.Sc. (CBCS) III - Semester Examination, November / December 2024**

**Subject : Crop Production**

**Paper – III : Plant Protection (Entomology & Plant Pathology)**

**Time: 3 Hours**

**Max. Marks: 80**

**PART – A**

**Note : Answer any Eight questions.**

**(8x4=32 Marks)**

1. Natural and environmental resistance
2. Classes of Arthropoda
3. Dominance of Insecta
4. First aid and antidotes
5. Gamma radiation
6. Categories of Pests
7. Viroids
8. Growth regulators
9. Polysaccharides
10. Eradication
11. Protection
12. Etiology

**PART – B**

**Note : Answer all the questions.**

**(4x12=48 Marks)**

- 13.a) Write in detail about History of Entomology in India.

**OR**

- b) Explain in detail effect of abiotic factors (temperature, moisture, rainfall, light) on insect population.

- 14.a) Write in detail about classification of insecticides and formulations of insecticides.

**OR**

- b) Explain the concepts of IPM, Practices and scope of IPM.

- 15.a) Explain in detail about Pre-penetration, Penetration and Post penetration.

**OR**

- b) Discuss the role of enzymes, toxins, growth regulators in plant diseases with examples.

- 16.a) Write in detail about general principles of plant disease management.

**OR**

- b) Discuss the symptoms, cause, etiology and specific control measures of diseases of Cereals

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**FACULTY OF SCIENCE****B.Sc. (CBCS) III - Semester Examination, November / December 2024****Subject: Biochemistry****Paper – III : Bioenergetics, Biological Oxidation and Enzymology****Time: 3 Hours****Max. Marks: 80****PART – A****Note : Answer any Eight questions.****(8x4=32 Marks)**

1. Energy transformations in the living system
2. Substrate level phosphorylation
3. Phosphate group transfer potential
4. Inhibitors of ETC & Oxidative phosphorylation
5. Mitchell's chemiosmotic theory
6. Ultrastructure & functions of chloroplast
7. Principles of energy of activation
8. Holo-enzyme & apo-enzyme
9. Active site
10. Factors affecting the catalysis
11. Zymogen activation
12. Ribozyme

**PART – B****Note : Answer all the questions.****(4x12=48 Marks)**

- 13.a) Define entropy and enthalpy. Explain exergonic and endergonic reactions with examples  
**OR**  
b) Describe the structure, types, and functions of cytochromes.
- 14.a) Define biological oxidation and write about the enzymes involved in biological oxidation reactions.  
**OR**  
b) Describe cyclic and non-cyclic photophosphorylation.
- 15.a) What are enzymes? Describe their classification and nomenclature.  
**OR**  
b) Define enzyme specificity and explain the models to describe interactions between enzyme and substrate.
- 16.a) What is enzyme inhibition? Explain the types of enzyme inhibitions with examples.  
**OR**  
b) Describe the mechanism of enzyme action and add a note on the regulation of enzyme activity.

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**FACULTY OF SCIENCE****B.Sc. (CBCS) III - Semester Examination, November/December 2024****Subject: DATA SCIENCE****Paper – III : Data Engineering with Python****Time: 3 Hours****Max. Marks: 80****PART – A****Note : Answer any Eight questions.****(8x4=32 Marks)**

1. What is a data acquisition pipeline in the context of data science, and why is it important in the data analysis sequence?
2. What is the use of report structure?
3. What is the Pickle module in Python used for, and why might it be beneficial in data science workflows?
4. Discuss the structure of HTML.
5. Name two methods commonly used in regular expressions for processing text data, and briefly describe their functions.
6. Give an example for any 2 regular expression methods.
7. What are the key steps involved in setting up a MySQL database?
8. What is the importance of NumPy in Python. Discuss
9. Briefly explain the concept of taming document stores, specifically referring to MongoDB.
10. Write short notes on mastering Embellishments.
11. How does Pandas handle missing data, and what methods can be used to address or manage missing values in a dataset?
12. What is the importance of Data Frame in Panda? Give an example

**PART – B****Note : Answer all the questions.****(4x12=48 Marks)**

13. (a) Outline and elaborate on the typical steps involved in a data analysis sequence. Discuss the challenges and considerations at each stage.  
(OR)  
(b) Explain the concept of handling files and working with text data in Python, covering types of files, text and binary file operations, CSV handling, and structured text data formats like JSON and XML.
14. (a) Discuss the challenges and techniques involved in processing texts written in natural languages. How can text data be effectively analyzed and extracted for meaningful information?  
(OR)  
(b) How to work with regular expressions using globe module? Give suitable examples with Python code.
15. (a) Explain how to read data from database table using fetchone() and fetchall() function using example program.  
(OR)  
(b) Discuss the capabilities of NumPy arrays in detail. Discuss array attributes, indexing methods, arithmetic operations, and mathematical functions. Provide examples to illustrate the various functionalities and their applications in handling tabular numeric data.
16. (a) Explain the process of reshaping and transforming data using Pandas. Discuss the importance of these operations in data analysis and provide examples to illustrate their applications.  
(OR)  
(b) Explain various functions of Pandas with example.

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**FACULTY OF SCIENCE**

**B. Sc. (CBCS) III – Semester Examination, November/December 2024**

**Subject: Artificial Intelligence and Machine Learning**

**Paper –III : Operating Systems with Linux**

**Time: 3 Hours**

**Max. Marks: 80**

**PART – A**

**Note: Answer any eight questions.**

**(8 x 4 = 32 Marks)**

1. Define operating system. Discuss the purpose of operating systems.
2. Write about time sharing and real time operating system with an example for each.
3. Write the features of Linux operating system.
4. What is critical section problem?
5. Write about CPU scheduling criteria.
6. Discuss various process management commands.
7. What are the necessary conditions for deadlock?
8. Write the functions of main memory.
9. Discuss basic system calls in Linux operating system.
10. Explain directory structure.
11. Write the advantages and disadvantages of I/O channel.
12. Discuss common disk management techniques used in operating systems.

**PART – B**

**Note: Answer all the questions.**

**(4 x 12 = 48 Marks)**

13. (a) (i) Explain different views in operating systems.  
(ii) Discuss operating system services.  
**(OR)**  
(b) What is a thread? Discuss in detail about multithreading models with suitable illustrations.
14. (a) Explain about semaphores in synchronization.  
**(OR)**  
(b) Describe about multilevel feedback queue scheduling with characteristics, advantages and disadvantages.
15. (a) Explain the Linux Memory Management Commands and System Calls with examples.  
**(OR)**  
(b) Write and explain Banker's algorithm for deadlock detection and avoidance, with an example.
16. (a) Discuss any two Disk Scheduling Algorithms.  
**(OR)**  
(b) Describe the Directory and Disk Structure in detail.

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**FACULTY OF SCIENCE**

**B. Sc. (Hon.) in Computer Science (CBCS) III – Semester Examination,  
November/December 2024**

**Subject: STATISTICAL METHODS**

**Time: 3 Hours**

**Max. Marks: 80**

**PART – A**

**Note: Answer any eight questions.**

**(8 x 4 = 32 Marks)**

1. Define correlation and its types.
2. Write short notes on the principle of least squares.
3. Define regression coefficients.
4. Define population and sample with examples.
5. Write short notes on the standard error.
6. Write short notes on non-sampling errors
7. Explain the fitting of Gompertz curve.
8. What are the uses of cost of living index numbers?
9. Write short notes on base shifting.
10. Explain the mathematical model of one way ANOVA.
11. What are the advantages and applications of RBD?
12. Explain the layout of LSD.

**PART – B**

**Note: Answer all the questions.**

**(4 x 12 = 48 Marks)**

13. (a) The ranks of 10 students in Mathematics and Statistics are given below. Obtain rank correlation coefficient.

Marks in Mathematics	36	20	34	48	52	25	65	35	45	60
Marks in Statistics	42	30	35	56	54	38	68	45	55	58

**(OR)**

- (b) The regression equations are  $8X - 10Y + 66 = 0$  and  $40X - 18Y = 224$  and variance of  $X = 9$ .

Obtain (i) mean values of  $X$  and  $Y$

(ii) correlation coefficient between  $X$  and  $Y$

(iii) standard deviation of  $Y$ .

14. (a) Distinguish between SRSWR and SRSWOR.

**(OR)**

- (b) A population consists of 400 students belong to two institutions, their means and standard deviations of their marks are given below.

Institutions	Number of Students	Means	S. Ds
I	300	50	20
II	100	40	10

Draw a sample of 40 students from the population of 400 students using proportional allocation. Obtain the variance of estimate of the population mean and compare the efficiency with sampling without replacement.

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15. (a) The following data is related to sales in a super market in various years. Calculate five year moving averages.

Year	2008	2009	2010	2011	2012	2013	2015	2016	2017	2018	2019	2020	2021	2022	2023
Sales	5	6	7	9	9	10	13	14	15	16	18	18	10	13	15

Also find the trend eliminated values by assuming additive model.

(OR)

- (b) Construct various simple aggregate price and quantity index numbers and simple averages of price relatives to the following data.

Commodities	2022		2023	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	30	10	40	20
B	50	20	80	15
C	20	50	40	40
D	40	10	55	12

16. (a) Four varieties of fertilizers have been applied to five plots each. The yield is given below. Analyse the data using two-way classification.

Varieties of fertilizers	Plots				
	I	II	III	IV	V
1	1.9	2.2	2.6	1.8	2.1
2	2.5	1.9	2.3	2.6	2.2
3	1.7	1.9	2.2	2.0	2.1
4	2.1	1.8	2.5	2.3	2.4

(OR)

- (b) The following data involves four treatments A, B, C and D are applied on top 20 experimental units, each treatment replicated 5 times. The data given below. Analyse the using CRD.

Treatments	Observations				
A	195	150	205	110	160
B	45	40	195	65	145
C	195	230	115	235	225
D	120	55	50	80	135

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**FACULTY OF SCIENCE**

**B. Sc. (CBCS) III – Semester Examination, November/December 2024**

**Subject: AGRICULTURE**

**Paper – III: Crop Improvement – Plant breeding and Agriculture Biotechnology**

**Time: 3 Hours**

**Max. Marks: 80**

**PART – A**

**Note: Answer any eight questions.**

**(8 x 4 = 32 Marks)**

1. Apomixis
2. Self pollination
3. Male sterility
4. Mass selection
5. Progeny test
6. Gene sanctuaries
7. Bulk method
8. Hybrid vigour
9. Hybridization
10. Foundation seed
11. Seed storage
12. Sun drying

**PART – B**

**Note: Answer all the questions.**

**(4 x 12 = 48 Marks)**

13. (a) What is cross pollination, write the mechanisms promoting cross pollination and genetic consequences of cross pollinated crops.  
(OR)  
(b) Define the term Plant breeding. Write the major achievements and future prospects of plant breeding.
14. (a) Write the procedure, purpose, merits and demerits of plant introduction.  
(OR)  
(b) Write the general procedure for evolving a variety by pure line selection and its merits and demerits.
15. (a) What is pedigree method? Write the procedure and modifications highlighting its merits and demerits.  
(OR)  
(b) What is Heterosis. Write brief history and manifestations of heterosis.
16. (a) Write about types of gene banks, distribution of crop species and centers of origin.  
(OR)  
(b) What is seed drying? Explain different methods of seed drying.

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**FACULTY OF SCIENCE****B.Sc. (CBCS) III - Semester Examination, November / December 2024****Subject : Zoology****Paper – III : Animal Physiology and Animal Behaviour****Time: 3 Hours****Max. Marks: 80****విభాగం - ఎ****సూచన: ఏదైనా ఎనిమిది ప్రశ్నలకు జవాబులు వ్రాయుము.****(8×4 = 32 మార్కులు)**

1. హెమోలో ఎంజైమ్
2. మాల్పిజియన్ గుళిక
3. క్లోరైడ్ కణాలు
4. ఉష్ణోగ్రత క్రమత
5. బోర్ ప్రభావం
6. న్యూరోజెనిక్ గుండె మరియు మయోజెనిక్ గుండె
7. సార్కోమియర్
8. న్యూరోట్రాన్స్ మీటర్లు
9. అధివృక్క గ్రంథి
10. ముద్రణము
11. ఫెరోమోన్స్
12. సర్వేడియన్ రిథమ్ మరియు సర్కానువల్ రిథమ్

**విభాగం - బి****సూచన: అన్ని ప్రశ్నలకు జవాబులు వ్రాయుము.****(4×12 = 48 మార్కులు)**

13. ఎ. కార్బోహైడ్రేట్ జీర్ణక్రియను విపులంగా తెలియజేయండి.

**లేదా**

- బి. ప్రతిప్రవాహ యంత్రాంగము అనగానేమి మరియు ఇది క్షీరద మూత్ర పిండములో సాంద్రీకృత మూత్రం ఏర్పడటానికి ఎలా సహాయపడుతుందో వివరించండి?

14. ఎ. ఆక్సిజన్ రవాణాను మరియు ఆక్సిజన్ వియోజన రేఖను గురించి వివరించండి.

**లేదా**

- బి. చక్కని పటం ద్వారా క్షీరద హృదయం యొక్క నిర్మాణాన్ని వివరించండి.

15. ఎ. నాడి ప్రచోదనము అనగానేమి మరియు దాని దశలను వివరించండి?

**లేదా**

- బి. పియూష గ్రంథి నిర్మాణం, స్రావాలు మరియు విధులను వివరించండి.

16. ఎ. పాష్లోవ్ యొక్క శాస్త్రీయ నిబంధన ప్రయోగం గురించి చర్చించండి.

**లేదా**

- బి. తేనెటీగలో సామాజిక ప్రవర్తనా యంత్రాంగమును వివరించండి మరియు దాని ప్రాముఖ్యతపై వివరణ ఇవ్వండి.

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## FACULTY OF SCIENCE

B.Sc. (CBCS) III - Semester Examination, November / December 2024

Subject : Physics

Paper – III : Electromagnetic Theory

Time: 3 Hours

Max. Marks: 80

విభాగం - ఎ

సూచన: ఏదైనా ఎనిమిది ప్రశ్నలకు జవాబులు వ్రాయుము.

(8×4 = 32 మార్కులు)

1. విద్యుత్ క్షేత్రం(E), విద్యుత్ పొటెన్షియల్ (V)ల మధ్య సంబంధాన్ని రాబట్టండి.
2. ఆవేశాల వ్యవస్థకు స్థితిజశక్తికి సమీకరణాన్ని రాబట్టండి.
3. విద్యుత్ క్షేత్రం (E) నిత్యత్వ స్వభావాన్ని వివరించండి.
4. ఆంపియర్ నియమ ఉపయోగాలను వ్రాయండి.
5. తిన్నని వాహకం వల్ల కలిగే క్షేత్రాన్ని ఆంపియర్ నియమాన్ని అనువర్తించి కనుక్కోండి.
6. అయస్కాంత క్షేత్రంలో నిల్వ ఉన్న శక్తిని రాబట్టండి.
7. స్థానభ్రంశ విద్యుత్ ప్రవాహం అనగానేమి?
8. స్వయం ప్రేరకత్వ గుణకాన్ని నిర్వచించండి.
9. పాయింటింగ్ సదిశకు సమాసాన్ని రాబట్టండి.
10. Q-గుణకంపై లఘు వ్యాఖ్యను రాయండి.
11. C-R వలయంలో ఆవేశ వృద్ధిని చర్చించండి.
12. క్రియాశీల (Active) నిష్క్రియ (Passive) మూలకాలు అనగానేమి?

విభాగం - బి

సూచన: అన్ని ప్రశ్నలకు జవాబులు వ్రాయుము.

(4×12 = 48 మార్కులు)

13. ఎ. స్థిర విద్యుత్ శాస్త్రంలో గాస్ నియమాన్ని తెలిపి, నిరూపించండి. ఏకరీతి ఆవేశితం చేసిన గోళం వలన కలిగే విద్యుత్ తీవ్రతను లెక్కించండి.

లేదా

- బి. విద్యుత్ పొటెన్షియల్‌ను నిర్వచించండి. అనంతమైన పొడవుగ విద్యుదావేశిత రేఖ వల్ల విద్యుత్ పొటెన్షియల్‌కు సమీకరణాన్ని రాబట్టండి.

14. ఎ. బయోట్-సావర్ట్ నియమాన్ని వివరించండి. విద్యుత్ ప్రవాహాన్ని పొడవైన సాలినాయిడ్ లోపల అయస్కాంత క్షేత్ర ప్రేరణ (B) ని లెక్కించండి.

లేదా

- బి. బాలిస్టిక్ గల్వానోమీటర్ నిర్మాణం, పనిచేయు విధానాన్ని వివరించండి.

15. ఎ. ఫారడే విద్యుదయస్కాంత ప్రేరణ నియమాలకు అవకలన, సమాకలన రూపాలను తెలిపి వివరించండి.

లేదా

- బి. మ్యాక్‌వెల్ సమీకరణాలను శూన్యంలో మరియు రోధక యానకంలో వివరించండి.

16. ఎ. AC ప్రవాహం కలిగిన LCR శ్రేణి వలయ సిద్ధాంతాన్ని విపులంగా తెల్పుండి. అనునాద నిబంధనను వివరించండి.

లేదా

- బి. గరిష్ట సామర్థ్య పరివర్తన సిద్ధాంతాన్ని (Maximum Power Transfer Theorem) తెలిపి నిరూపించండి.

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**FACULTY OF SCIENCE**

**B.Sc. (CBCS) III-Semester Examination, December - 2024**

**Subject : Zoology**

**Paper - III : Animal Physiology and Animal Behaviour**

**Time : 3 Hours**

**Max: Marks : 80**

**حصہ-الف (8x4=32Marks)**

**نوٹ: صرف آٹھ (8) سوالات کے جوابات دیجیے۔**

1. ہولوائزائیم
2. مال نیجین کپسول
3. کلورائیڈ سیلس
4. تھرموریکولیشن
5. بھور اثر
6. نیورو جنک ہارٹ اور مایو جنک ہارٹ
7. سارکومیئر
8. نیورو ٹرنسمیٹرس
9. ایڈرینل غدود
10. ایپیریٹنگ
11. فیرومنس
12. سرکارڈین رتھم اور سرکانیول رتھم

حصہ - ب (4x12=48Marks)

نوٹ: تمام سوالات کے جوابات دیجیے۔

(a.13) کاربوہائیڈریٹ ہاضمہ پر تفصیل سے لکھئے۔

یا

(b) کاونٹر کرٹ میکانیزم کیا ہے؟ یہ پستانوں کے گردے میں مرکوز پیشاب یا یورین کی تیاری میں کس طرح مدد دیتا ہے۔

(a.14) آکسیجن کی منتقلی اور آکسیجن ڈی سواشن کردہ کو سمجھائیے۔

یا

(b) پستانوں کے قلب کو صاف نامزدہ خاکے سے بیان کیجئے۔

(a.15) nerve impulse کیا ہے؟ اس کے مراحل کو سمجھائیے۔

یا

(b) pitutary gland کی ساخت، افرازات اور افعال کو بیان کیجئے۔

(a.16) pavlev's کے کلاسیکل کنڈیشننگ کے تجربے کے بارے میں بحث کیجئے۔

یا

(b) شہد مکھی میں social organization کو سمجھائیے اور اس کی اہمیت پر نوٹ لکھئے۔

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