4. (a) What are the input and output components of circadian clock ? (7)

   (b) Describe the molecular mechanism essential for the generation of time in mammals. (8)

5. (a) What are the characteristics of circadian rhythm? Explain the Aschoff s rule for circadian behavior. (9)

   (b) What is the role of melatonin in circadian rhythm? (6)

6. (a) What are biological rhythms? Explain with the help of examples various types of biological rhythms. (12)

   (b) Give adaptive significance of biological rhythms. (3)

7. Write short note on any **three** : (5×3=15)

   (a) Migration in birds

   (b) Lunar rhythms

   (c) Chronotherapy

   (d) Transcription-translation model in Drosophila

   (e) Sleep disorders

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 1261 **I**

Unique Paper Code : 2233010009

Name of the Paper : DSE-9, Chronobiology

Name of the Course : **B.Sc. (H) Zoology, (NEP-UGCF 2022)**

Semester : V (DSE-9)

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all including questions No. **1** which is compulsory.

1. (a) Define the following : (1×5=5)

   (i) Amplitude (ii) Chronotype

   (iii) Free running rhythms (iv) Masking

   (v) Chronomedicine

   (b) Distinguish between : (2×5=10)

   (i) Central clock and peripheral clock

(ii) Jet lag and Shift work

(iii) Photic and non-photic Zeitgebers

(iv) Nocturnal and diurnal animals

(v) Type I and Type II annual rhythms

(c) Fill in the blanks : (1×5=5)

(i) The amount of time it takes for one complete cycle of motion is called _____.

(ii) _____ is the science concerned with the variations in the pharmacological actions of various drugs over a biological timings.

(iii) Shortening of period for one to a few cycles is termed as _____.

(iv) _____ is a sleep disorder in which you have trouble falling and/or staying asleep.

(v) A _____ is a roughly 24 hour cycle in the physiological processes of living beings, including plants, animals, fungi and cyanobacteria.

(d) Contribution of following scientists : (1×3=3)

(i) Franz Halberg

(ii) Erwin Bunning

(iii) Michael Rosbash

(e) True and false : (1×4=4)

(i) In humans levels of melatonin peaks during early hours of morning.

(ii) The biological rhythm can be reset by external stimuli such as heat, light and temperature.

(iii) Crepuscular species are most active during both dawn and dusk.

(iv) Sleep wake cycle is an infradian rhythm.

(f) Expand the following : (1×3=3)

(i) REM

(ii) SCN

(iii) CBT

2. (a) Define circannual rhythm with an example. (3)

(b) Explain the stages of Hibernation and physiological mechanism involving the same. (8)

(c) Enlist the differences between long day and short day breeders? (4)

3. (a) Describe sleep-wake cycle. (2)

(b) What are various stages of sleep? (5)

(b) Outline the consequences of clock dysfunction. (8)