GULF SAHODAYA (SAUDI CHAPTER) EXAMINATION

SESSION 2013-2014

GRADE –XI **TIME -3 HOURS AND 30 MINUTES**

SUBJECT BIOLOGY (CODE 44) **MARKS 60 +10 FOR OTBA**

SET –A

General instructions –

1. All questions are compulsory.
2. This question paper consists of four Sections A, B, C and D and OTBA
   Section -A contains 8 questions of one mark each, Section -B contains 9 questions of two marks each Section –C contains 8 questions of three marks each, there is one value based question of 3 marks in this category.
   Section D contains 2 questions of five marks each
3. There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and two questions of 5 marks. Attempt only one of the alternatives in such questions.
4. Wherever necessary, the diagrams drawn should be neat and properly labelled.
5. OTBA has 2 questions of five marks each

SECTION-A

1. Pick out the pancreatic hormones from the list given below. ½+1/2.

   Secretin, Insulin, glucagon, epinephrine, cortisol.

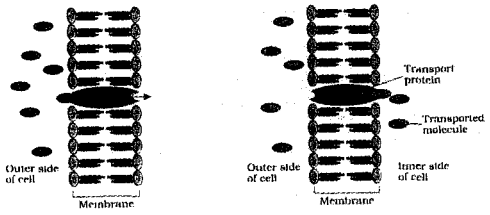
2. Explain the term plasticity in plants? Elaborate heterophylly with an example?1/2+1/2.

3. Differentiate between the saturated and unsaturated fatty acids? 1

4. Following the binomial nomenclature rule write the scientific name for –

   A) Mango B) Tiger ½+1/2

5. Identify and define the process exhibited by the picture given below??1/2+1/2



6. Name the protozoan group to which *Trypanosoma* belongs. Write two more characteristics of that group? 1

7. Identify the organelle of the eukaryotic cell on the basis of the given clues and write its function ?1

   A) I am a network or reticulum of tiny tubular structure dividing the intra cellular space into two distinct compartments

   B) I have ribosomes attached on my surface. ½+1/2

8. Fill in the blanks-

   Hind brain comprises of _____ , _____ and _____ .1

SECTION B

9. Gemmae are the specialized structures found in liverworts. Explain their significance and function?2

10. Identify the phylum of kingdom animalia on the basis of the characteristic feature given below? 2
    a) Body covered with the calcareous shell and is unsegmented with the distinct head, muscular foot and visceral hump
    b) Presence of the choanocytes and skeleton of spicules.
    c) Capacity of bioluminescence
    d) Worm like with proboscis, collar and trunk

11. Differentiate between the early and late wood ?what is its role in the estimation of the age of the tree?2

12. Identify the diagram given below and label a ,b ,c and d ?2

13. Activity of the succinic dehydrogenase is inhibited by which chemical? Explain in detail the phenomena it represents with reference to enzyme activity?2

14. Explain the process of nodule formation with the special reference to the leg-hemoglobin ?2

15. Photorespiration is one process which creates an important difference between the C3 and C4 plants ? What is the photorespiration and Why is it considered to be the wasteful process?2

16. What is the respiratory quotient? What is the respiratory quotient for the tripalmitin?2

17. Expand and differentiate between IRV and ERV?2

OR

17' Juxta glomerular apparatus plays an important role in regulation of kidney function. Explain in brief .2

SECTION C

18. Describe the arrangement of the floral members in relation to their insertion on the thalamus?3

19. Explain the structure of the dicotyledonous seed with the help of the diagram?3

Or

Explain the structure of the deoxyribonucleic acid?2+1

20. Distinguish between the anaphase of the mitosis and anaphase I of the meiosis?3

21. Draw the schematic diagram of the Krebs's cycle?3

22. With the help of the diagram explain the structure of the nephron?3

23. Name the theory that explains the muscle contraction. Explain it with the help of the diagram ?3

24. Mr RSTV has a sedentary life style. On his regular medical check up report he was diagnosed with high blood pressure and high cholesterol.
    A) What kind of values are shown by the Mr RSTV.
    B) Differentiate between the pulmonary and systemic circulation.
    C) Explain the conduction and generation of the heart beat. 1+1+1

25. Fill in the blanks-3

Name of the digestive juice	Name of the enzyme	Substrate	Products
Saliva	**A**	Starch	**B**
Pancreatic juice	**C**	Carbohydrate	**D**
Pancreatic juice	**D**	Nucleic aid	**E**

SECTION D

26. Name any two double membrane bound organelles? Draw the labelled diagram for them? Write in detail their characteristics, structure and function?

OR

26' a) Give the schematic diagram of the glycolysis ?

b) Distinguish between aerobic and anaerobic respiration? 3+2

27. a) Differentiate between the cyclic and non- cyclic photophosphorylation ? Draw schematic diagram for the cyclic and non- cyclic photophosphorylation?
    b) State the law of the limiting factor? Name the scientist who proposed it? 3+2

OR

27'. A) A unicellular organism underwent division to produce two cells which are morphologically and genetically similar to the parent ?identify which type of the division is involved and explain all the steps along with the diagram ?3

B) Explain the significance of the mitosis and meiosis?1+1

Section: OPEN TEXT- BASED ASSESSMENT (OTBA)

Class XI

Questions

Instructions for Students:

01. These questions are based on one of the themes provided to you by the Board.
02. Please ensure that you get a copy of the relevant themes from the school to refer while answering the questions.
03. Each Question carries 5 marks.
04. The suggested word limit for the questions is 100-120 words. However depending on the question, your answer could be shorter/ longer. It is important to present your views, arguments and conclusions logically, coherently in your own language; based on the concepts learnt during teaching learning sessions till class XI, their applicability with respect to the open text material and your own awareness of the given theme.

Subject – Biology (Code: 044)

Question	Marks	Theme
a) नदी घाटी परियोजनाओं की स्थापना के लिए वनोन्मूलन की आवश्यकता होती है और इससे आवासों की हानि होती है। क्या ऐसा होते हुए भी हमें इन परियोजनाओं को जारी रखना चाहिए? टिप्पणी कीजिए। Establishment of river valley projects requires deforestation that leads to habitat loss. Should we go for such projects inspite of this? Comment.	MARKS -5	Theme-II
b) भारत अपने विपुल वनों और जैव विविधता के लिए प्रसिद्ध है। व्याख्या कीजिए कि हमारे देश के आर्थिक और औद्योगिक विकास में वन किस प्रकार महत्वपूर्ण भूमिका निभाते हैं। India is known for its rich forests and biological diversity. Explain how forests play a vital role in economic and industrial development of our country.	MARKS -5	Theme-II

OPEN TEXT MATERIAL

2. Theme – *"Incredible India"*

Abstract:

India is known for its rich heritage of biological diversity. With only 2.5% of the world's land area, India accounts for 7.8% of recorded species of the world including 46,000 recorded species of plants and 91,000 recorded species of animals. It possesses an exemplary diversity of ecological habitats like forests, grasslands, wetlands, coastal and marine ecosystems, and desert ecosystems.

Therefore it is not surprising that India is considered to be one of the world's 17 'mega diverse' countries in terms of biodiversity.

India takes its commitment to preserve biodiversity very seriously. This is not only because of India's international obligations as a signatory to the Convention on Biological Diversity, it is also because India believes that protecting our biodiversity is a critical national priority as it is linked to local livelihoods of millions of people in the country. Sustainable use of our biodiversity therefore has both ecological and economic value.

This text focuses on the biodiversity found in one of the two major hotspots of biodiversity in India i.e. Western Ghats.

India is a nation, rich in cultural heritage and biodiversity. Biodiversity here is related to socio-cultural practices. Efforts have been made since ancient times to conserve biodiversity either consciously or by relating it to culture and religion. But due to population explosion, urbanization, fragmentation of habitats, climate change and the careless attitude of human being, several species are facing the threat of extinction. This is not only affecting food chains, but is also affecting the livelihood and culture of many Indians as their life is intricately knit around the biodiversity of their area.

India is situated at the tri junction of the three realms- Afro-tropical, Indo-Malayan and Paleo-Arctic. It has characteristic elements from each one of them. This assemblage of three distinct realms makes the country rich and unique in biodiversity.

As measured by the number of plant and animal species, maximum biodiversity is seen in tropical rain forests. For this reason the Western Ghats and the North-East in India are the richest habitats for species diversity. They are also included in the world's list of hotspots of biodiversity; small geographical areas with high species diversity. Western Ghats have more endemic species, those that are found nowhere else.

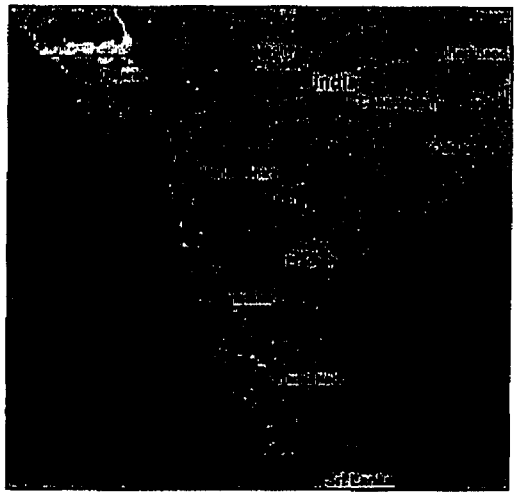
Approximately 65 percent of total geographical area in India has been surveyed and approximately 46,000 species of plants and 91,000 species of animals have been described so far by the Botanical Survey of India and Zoological Survey of India respectively. Of these about 4,900 species of

flowering plants are endemic to India. They belong to 141 genera spread over 47 families. These are distributed mainly in floral valleys of North–East India, North- West Himalayas, Western Ghats and the Andaman and Nicobar Islands.

A biogeography region with a significant reservoir of biodiversity that is threatened with destruction is called biodiversity hot-spot. A hot-spot should have at least 0.5 percent of endemic plant species which are found nowhere else. 25 biodiversity hot-spots have been identified at global level, of which two are present in India. These include: Indo- Burma and the Western Ghats and Sri Lanka. These two hot-spots cover less than 2% of the world's land area but have about 50% of the total terrestrial biodiversity. They contribute prominently in geographic extent, bio-physical, socio-cultural diversity and uniqueness. The extent of species endemism in vascular plants alone ranges from 32% to 40% in these mountain ecosystems.

The Indo-Burma hot-spot is one of the most threatened biodiversity hot-spots because of the rapid rate of habitat loss and resource exploitation. It is spread over Cambodia, Vietnam, and Laos, Thailand, Myanmar, Bhutan, parts of Nepal, far eastern India and extreme southern China, Mainan islands in South China Sea and Andaman and Nicobar islands in Indian Ocean.

The Western Ghats, also known as the Sahyadri Hills constitute mountain forests along the south-western side of India and on the neighboring islands of Sri Lanka. This too enjoys the status of UNESCO World Heritage site. The range runs north to south along the Western edge of the Deccan Plateau and separates the plateau from a narrow coastal plain called the Konkan along the Arabian Sea. The range starts near the border of Gujarat and Maharashtra, south of Tapti river and runs over 1600 Km through the states of Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala ending at the southern tip of India. It is one of the world's ten hottest biodiversity hotspots.



***Figure–1:** Western Ghats*

http://www.indiawaterportal.org/sites/indiawaterportal.org/files/wghat.jpg

The word 'ghats' refers to a series of steps leading to a sacred river. Here, the steps are really a long range of hills and mountains covered in tropical vegetation. These hills drain water into large river systems which, according to the researcher, benefits 'over 200 million people'. A wholly unique forest, the Western Ghats also serves as a long standing agricultural area.

The climate here is humid and tropical, tempered by its proximity to the sea. Elevations of 1,500 m (4,921 ft) and above in the north and 2,000 m (6,562 ft) and above in the south have a more temperate climate. Average annual temperature here is around 15°C (60°F). In some parts, frost is common, and temperatures touch freezing point during winter months. Mean temperature ranges from 20°C (68°F) in the south to 24°C (75°F) in north. It has also been observed that the coldest periods in south Western Ghats coincide with the wettest.

Unlike many of the world's other great rainforests, the Western Ghats has long been a region of agriculture. This is one place in the world where elephants walk through tea fields and tigers migrate across betel nut plantations. While wildlife has survived alongside humans for centuries in the region, continuing development, population growth and intensification of agriculture are putting increased pressure on this inherently precarious relationship.

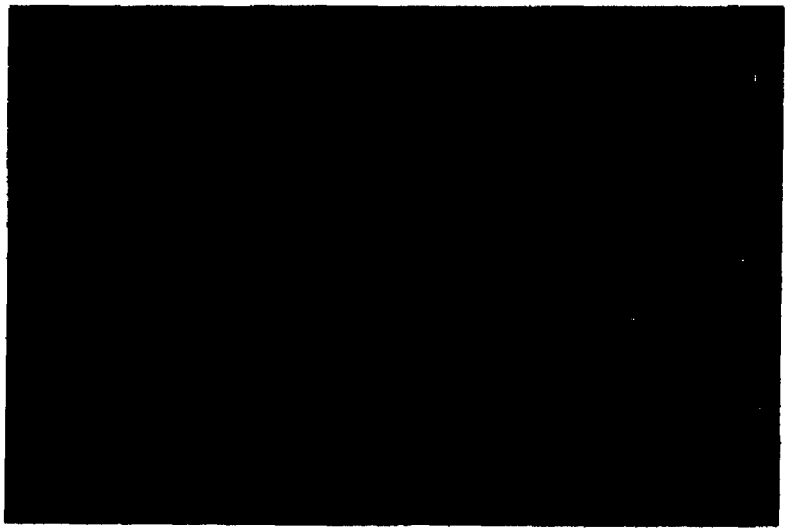


***Figure-2:** An Asian elephant wandering in tea fields in Western Ghats*

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Four types of tropical and sub-tropical broad leaf forests are found in the Western Ghats. These include:, North Western Ghats' moist deciduous forests, North Western Ghats' mountain rain forests, South Western Ghats' moist deciduous forests, South Western Ghats' mountain rain forests. The northern portion of the range is generally drier than the southern portion.

In the north, the lower elevation has deciduous forests whereas the higher altitude (above 1000 m) has mountain rain forests. The North Western Ghats' moist deciduous forests are rich in teak trees

and North Western Ghats' mountain rain forests are characterised by trees of family Lauraceae. The family comprises over 3000 species of flowering plants in over 50 genera world-wide. Most are aromatic evergreen trees or shrubs, but one or two genera such as Sassafras are deciduous, and Cassytha is a genus of parasitic vines. Lauraceae are among the top five families in terms of the number of species present. The fruit of Lauraceae is a drupe, a one-seeded fleshy fruit with a hard layer, endocarp, surrounding the seed. However, the endocarp is very thin, so the fruit resembles a one-seeded berry.

These plants are adapted to high rainfall and humidity, and have leaves with a generous layer of wax, making them glossy in appearance, and a narrow, pointed-oval shape with a 'drip tip', which permits the leaves to shed water despite humidity, allowing transpiration to continue.

- ☆ Many members of family Lauraceae contain high concentrations of essential oils, some of which are valued for spices and perfumes. Some of the essential oils are valued as fragrances, such as in the traditional laurel wreath of classical antiquity, or in cabinet making, where the fragrant woods are prized for making insect-repellant furniture chests. Some are valued in cooking, for example, bay leaves are a popular ingredient in European, American and Asian cuisines. Avocados are important oil-rich fruit that are cultivated in warm climates around the world.
- ☆ Many species are exploited for timber.
- ☆ Some species are valued as sources of medicinal material.

The following genera include some of the best known species of particular commercial value:

- ☆ *Cinnamomum*: Cinnamon, Cassia and Camphor Laurel
- ☆ *Laurus*: Bay Laurel
- ☆ *Persea*: Avocado

Loss of habitat and over-exploitation for such products, has put many species in danger of extinction, as a result of overcutting, extensive illegal logging and habitat conversion.

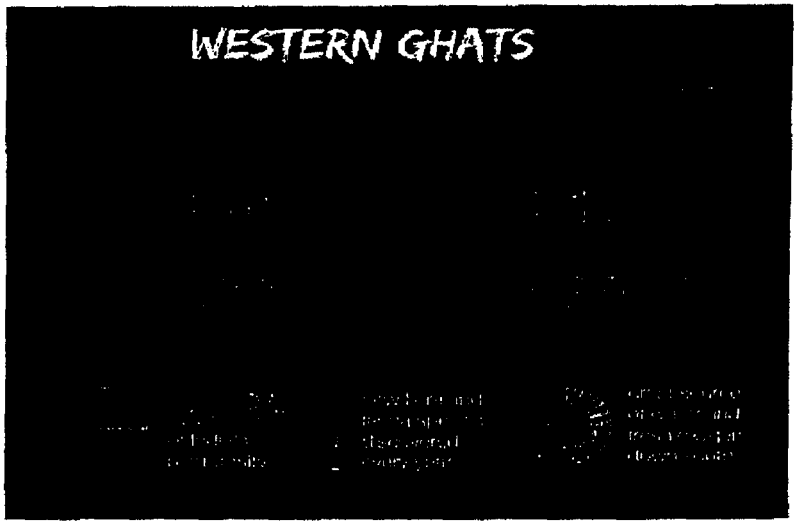
Lauraceae flowers have a complex flowering system to prevent inbreeding. The fruits are an important food source for birds. Seed dispersal of various species in the family is also carried out by monkeys, arboreal rodents, porcupines and opossums.

The evergreen Wayanad forests of Kerala mark the transition zone between northern and southern ecologic regions of the Western Ghats. The southern ecologic regions are generally wetter and more species-rich. At lower elevations are the South Western Ghats moist deciduous forests, with *Cullenia*, the characteristic tree genus, accompanied by teak and other trees.

Above 1,000 meters are the South Western Ghats mountain rain forests, also cooler and wetter than the surrounding low-land forests, and dominated by evergreen trees, although some mountain

grasslands and stunted forests can be found at the highest elevations. The South Western Ghats mountain rain forests are the most species-rich ecologic region in peninsular India; eighty percent of the flowering plant species of the entire Western Ghats range are found in this ecologic region.

Historically Western Ghats were well-covered in dense forests that provided wild foods and natural habitats for the native tribal people. Its inaccessibility made it difficult for people from the plains to cultivate the land and build settlements. After arrival of the British in the area, large swathes of territory were cleared for agricultural plantations and timber. Forest in the Western Ghats has been severely fragmented due to human activities, especially clear felling for tea, coffee, and teak plantations during 1860 to 1950. Species that are rare, endemic and habitat specific are more adversely affected and tend to be lost faster than other species. Complex and species rich habitats like the tropical rainforest are much more adversely affected than other habitats.



***Figure–3:** Animal Species diversity in Western Ghats*

http://amoghavarsha.com/stories/western-ghats/western-ghats-infographic.jpg

Western Ghats are home to thousands of animal species with more than thousand vertebrate species including at least 325 globally threatened species. Many are endemic species, especially in amphibian and reptilian classes. Thirty two threatened species of mammals live in the Western Ghats. Of the 16 endemic mammals, 13 are threatened.

☆ **Mammals** – There are at least 140 mammal species. The Malabar large-spotted civet (*Viverra civettina*), also known as the Malabar civet, is endemic to the Western Ghats of India. It is listed as Critically Endangered by IUCN as its population size is estimated to number fewer than 250 mature individuals. The arboreal lion-tailed macaque (*Macaca silenus*), is an Old World monkey, endemic to the Western Ghats of South India. It has been listed as endangered, as only 2500 members of this species are remaining. The largest population of the Lion tailed macaque is in Silent Valley National Park. Kudremukh National Park also protects a viable population.

Figure–4 a): *Lion tailed macaque* ***Figure–4 b):*** *large-spotted civet*

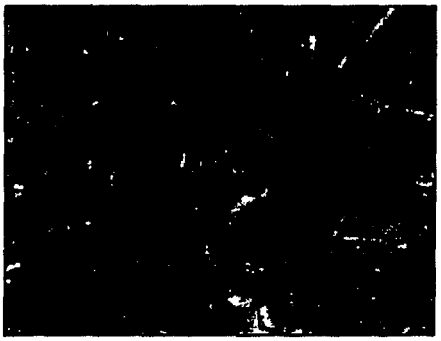
http://t2.gstatic.com/images?q=tbn:ANd9GcTbXhQZ0CcdEwRyteZhVHq8SL4Mf2CprrJGPwgeBgOTdPhn9B
http://media5.picsearch.com/is?MzA8Gtmg9ZNdcy5sucew71jScAvn0Y51kTV0ab_YTC8&height=228

These hill ranges serve as important wildlife corridors, allowing seasonal migration of endangered Asian elephants. The Nilgiri Bio-sphere is home to the largest population of Asian Elephants and forms an important part of Project Elephant and Project Tiger. Brahmagiri and Pushpagiri wildlife sanctuaries are important elephant habitats. Karnataka's Ghat areas hold over six thousand elephants (as of 2004) and ten percent of India's critically endangered tiger population.

The largest population of India's tigers outside the Sundarbans is in unbroken forests bordering Karnataka, Tamil Nadu and Kerala. It has an important elephant corridor connecting the forests of Tamil Nadu with those of Karnataka. It is a home to Black Panther and normal variety of leopards and significant populations of Great Indian Hornbill.

☆ **Reptiles** – 260 species of reptiles are found in this region. The snake family Uropeltidae of the reptile class is almost entirely restricted to this region.

☆ **Amphibians** – Amphibians of the Western Ghats are diverse and unique, with more than 80% of the 180 amphibian species being endemic to the region. Most of the endemic species have their distribution in the rainforests of these mountains. The endangered Purple frog was discovered in 2003 as a living fossil.



Figure–5: *Purple frog*

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