



Chhatrapati Shahu Ji Maharaj
University, Kanpur

Answer Script Details
Barcode 11621080

Roll No. 24062000472
Total Mark 50/75.00

Exam M.SC-III_ODD_EXAM_NOV_2025
Subject B040905T - Biodiversity And Conservation (Elective)

Question wise Mark Summary

Q.No Mark Q.No Mark Q.No Mark Q.No Mark

1A	4/5				
1B	4/5				
1C	3/5				
1D	3/5				
1E	4/5				
1F	2/5				
1G	3/5				
1H	3/5				
1I	3/5				
2	0/15				
3	0/15				
4	0/15				
5	11/15				
6	0/15				
7	0/15				
8	0/15				
9	10/15				

**Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh**

FACT-I

Date of Exam: 10/12/25 Shift: III Room No.: 25
 Paper Code: 60409057
 Subject: Biodiversity
 Year: 6th - III
 Name of Candidate: NANCY RATHI
 Roll No.: 24062000472

Signature of Candidate: Nancy
 Signature of Invigilator: [Signature]
 COE Facsimile: [Signature]

PART-II

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										
(e)										
(f)										
(g)										
(h)										
(i)										
(j)										
Total										
Total Marks in Figures						Max. Marks				
Total Marks in Words										



60409057
Paper Code

Signature of Evaluator

FACT-III

Course: Master of Science (Botany)
 Session: 2025-26 Year/Semester: III
 Subject: Biodiversity & Conservation
 Paper Code: 60409057
 Exam Date: 10/12/2025
 Name of Candidate: NANCY RATHI
 Father's Name: GAHA PRASAD RATHI

संस्थान का कोड
College Code: KNO4

A	A	0	0
B	B	1	1
C	C	2	2
D	D	3	3
E	E	4	4
F	F	5	5
G	G	6	6
H	H	7	7
I	I	8	8
J	J	9	9
K	K	0	0
L	L	1	1
M	M	2	2

परीक्षा केंद्र का कोड
Exam Centre Code: KNO4


A	A	0	0
B	B	1	1
C	C	2	2
D	D	3	3
E	E	4	4
F	F	5	5
G	G	6	6
H	H	7	7
I	I	8	8
J	J	9	9
K	K	0	0
L	L	1	1
M	M	2	2

परीक्षा का प्रकार
Type of Exam

Regular Ex-Student
 Private Back paper Exam

ANSWER BOOKLET NO.
11621080

Paper Code: 60409057



FACT-IV

समावेश संख्या
Enrollment Number: CSJMA24000131658

परीक्षार्थी अनुक्रमांक संख्या
Candidate's Roll Number: 24062000472

पेपर कोड
Paper Code: 60409057

0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9



Signature of Candidate: Nancy

Signature of Invigilator: [Signature]

CS Facsimile

COE Facsimile

नोट : 1. परीक्षाओं को निर्दिष्ट दिन आता है कि आसपास परी से कुछ आगे पर लक्षित सभी निर्देशों को समझने शुरू करें।
 2. परीक्षा में परी जाने वाली परीक्षार्थी सभी उत्तर से शुरू की जायें। 3. परीक्षा को करने का पीके संकेतन से परत जायें।

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in Boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below blacken the circles completely.



4. Make no Stray marks on this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

IN ORDER TO AVOID UFM (UNFAIR MEANS):

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/ electronic watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

अनुचित साधन से बचने हेतु:

1. उत्तर पुस्तिका के निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखें तथा कोई भी चिन्ह न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बारकोड अथवा उत्तर पुस्तिका संख्या पर छेद करने पर अनुचित साधन प्रयोग माना जाएगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लाये, जैसे लिखे हुए कागज के टुकड़े, मोबाइल, डिजिटल डायरी, कोपी, पुस्तक यह सभी वस्तुएं जो अनुचित साधन की अवर्गीत जाती है। केवल संबंधित प्रश्नपत्र में ही मेमोरी लैस साइंटिफिक कैल्कुलेटर ले जाने की अनुमति होगी।
4. उत्तर पुस्तिकाओं में रूपये न रखें न ही उत्तर पुस्तिका में चिपकार्य। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

परीक्षार्थी के लिए निर्देश

1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र कोड सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृ (1-24) से कम है या कटे हुए हैं, तो परीक्षा शुरू होने के पूर्व दूसरी तरफ पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उसके परीक्षा शुरू होने के 30 मिनट के अन्दर व निरीक्षक को तत्काल सूचित करें, उसके बाद विश्वविद्यालय द्वारा क कार्रवाई नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. B कोपी या अतिरिक्त ग्राफ नहीं दिया जायेगा।

INSTRUCTIONS TO THE CANDIDATE

1. Read the instructions carefully given on the Question Paper Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-32) or any other kind of damage in your answer script, if found than change the answer script immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Subject Name and Question of the Question Paper during first THIRTY MINUTES of the commencement of the exam, so that it can be corrected in TIME. After that no corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over paper should fill in status as Carry Over. Those appearing as Examiners should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numerals in Boxes.
2. Use blue or black ball point pen for filling the circles.

1	8	1	5	4	3	2	1	6	9
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	●	Ⓐ	●	Ⓐ	Ⓐ	Ⓐ	●	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	●	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	●	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	●	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ
Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	Ⓐ	●

Note - If your Roll No. is of 10 digits. Please leave first three column



Section → B

Answer → 5

Biodiversity means diversity in the life forms. Biodiversity is important for ecosystem stability, ecosystem function and many more important things but due to man made things and natural (some) calamities biodiversity is facing heavy losses so it is very important to conserve the biodiversity and measures (different) are taken to conserve biodiversity.





In situ Conservation

In situ conservation is the conservation of the biodiversity ~~found~~ at the site (at the native habitat). In situ conservation can be done by different methods by protecting areas.

- ① National parks
- ② hotspot
- ③ wild life sanctuaries
- ④ Sacred groves
- ⑤ Biosphere reserves

One process of the in situ conservation is as follows:—

① Survey

Survey is done of the different areas so that we get to know that if there is the need for the conservation or not, there are endemic species of plants or animals or not.

② Cartography

Maps are made to determine the



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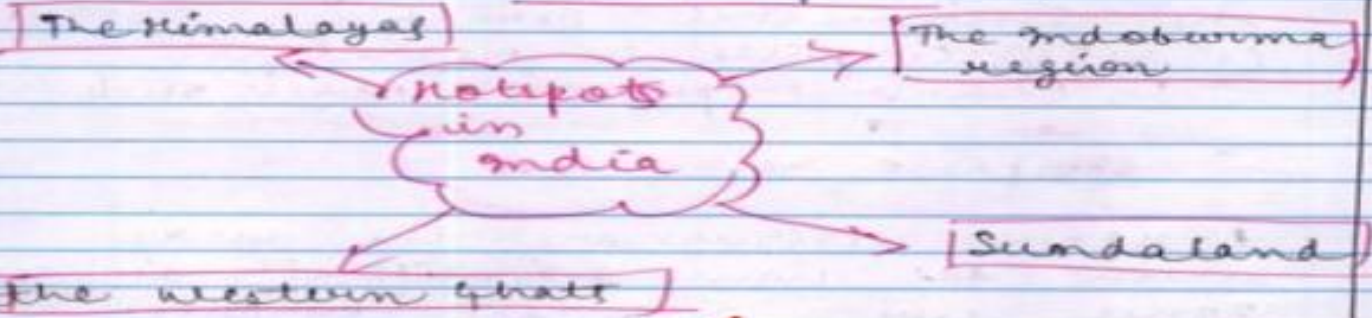


exact locations and the site of the conservation.

5. Protected Area.

a.) Hotspots.

Hotspots are the areas protected where high biodiversity is found. For a site to be a hotspot it is important that it must have at least 1500 vascular species of plants and 70% of the habitat is destroyed. In India there are 4 major hotspots and in world there are 36 hotspots.



b.) National Parks

The National Parks are the protected areas by the government. ~~So~~ where



• cutting of tree or destruction of the habitat is prohibited and hunting, touching of the animals is also prohibited.

main Eg of the National parks:-

↳ Bandipur National Park (Karnataka)
↳ Gir National Park (Gujarat)
↳ Jim Corbett National Park (1st National Park)

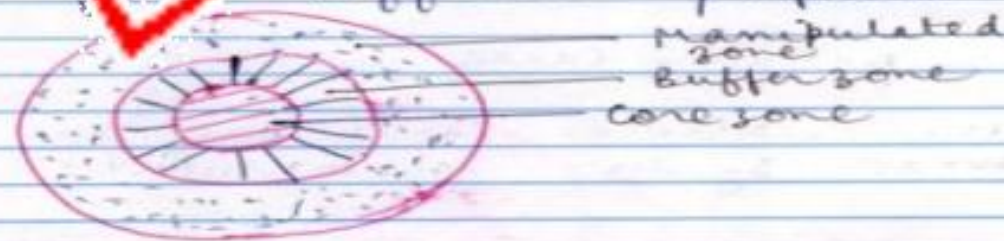
3. Sacred groves

Sacred groves are the areas which are protected by the people on the religious or the sentimental behalf.

Eg: ⇒ Jaintia hills in Meghalaya
↳ Bishnoi's protect Black Buck

4. Biosphere reserves

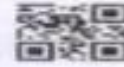
Biosphere reserves are the areas which are scientifically divided into different zones for different purposes.



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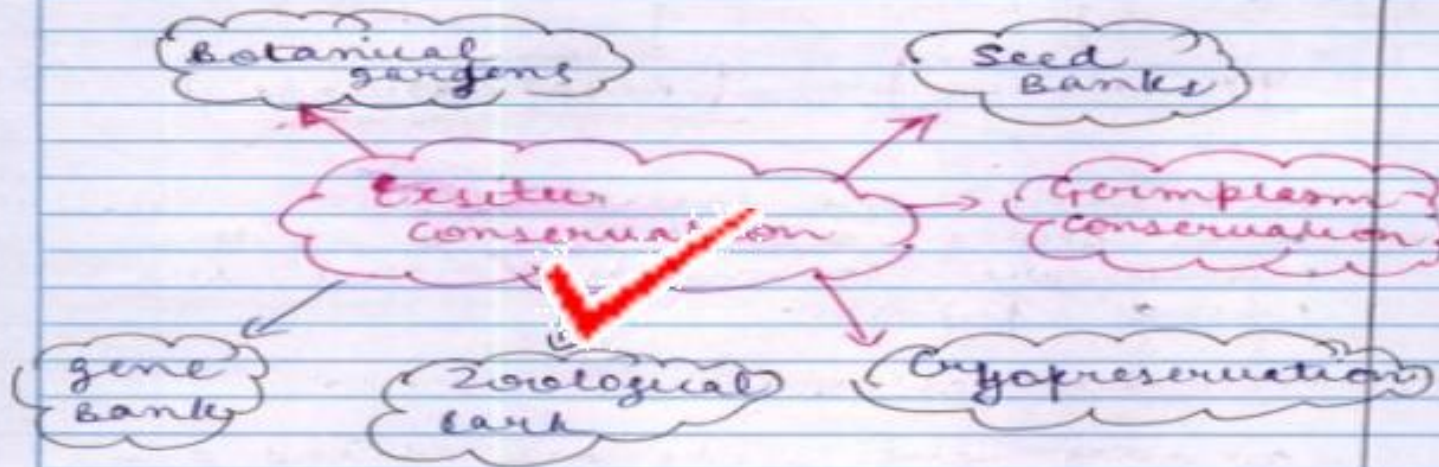
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The Biosphere reserves are comes under MAB in UNESCO.

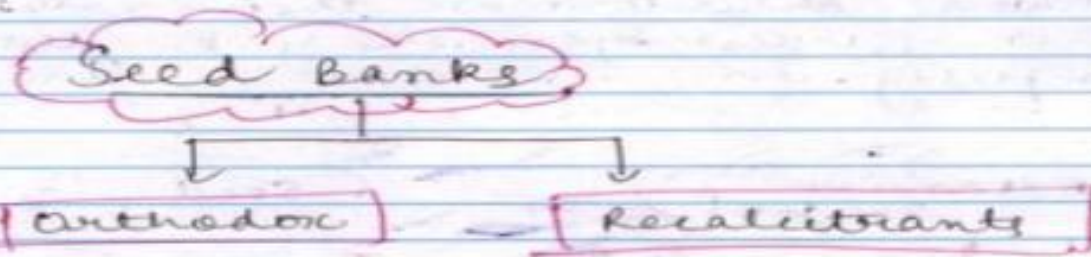
Ex-situ conservation

The ex-situ conservation or offsite conservation is that the protection and is given to flora and fauna offsite, they are conserved away from their natural habitat as their native habit is destroyed badly or destroyed completely.





Ex situ conservation ^{can} be done ^{offsite} of as we all know. For animals ~~and~~ it can be temporary or ~~too~~ permanent as if the habitat is mildly destroyed then temporarily animals can be taken ~~to~~ for conservation till the conditions are stabilized & if habitat is completely destroyed then animals are ~~to~~ permanently kept in new habitat which is similar to the old habitat.



Seed Banks are the banks in which the spores / seeds / tubers of the plants are conserved for the future purposes.

Orthodox method

in this the seeds are dried and then conserved at the low temperature.

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Recalcitrants

On this the seeds which cannot be stored surviving without moisture and can not survive in a very cold temperature then this method is obtained for those.
eg:- coconut.

Cryopreservation:

On this the germplasm is conserved at liquid nitrogen -196°C (at very low temperature). This is very important as it by this the germplasm of the endangered species can be conserved and can be used and made into the plant when needed. Cryoprotectants are used for the safety of the germplasm.

Procedure :-

1. Selection
2. Adding cryopreservant
3. Freezing
4. or putting in liquid nitrogen
5. Thawing
6. Washing
7. Checking survivability
8. Reculturing
9. New plant



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Tissue culture

Tissue culture can also be used for ex-situ conservation.

- ↳ callus culture
- ↳ protoplast culture
- ↳ anther culture
- ↳ Micropropagation etc.

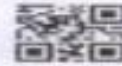
• can be used and the parts can be conserved and when needed they can be regenerated into new plants.

In tissue culture first the ex-plant part is selected, then the part needed is isolated, then it is grown in media and then there is root/shoot development and after that whole plant can be regenerated.

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Section → C

~~Biological diversity is the diversity of the~~

Biological diversity means presence of the different kind of life forms in the surroundings / environment.

Biodiversity is very important to conserve so there are the steps taken by government to conserve the Biodiversity by giving:

↳ BIODIVERSITY ACT

the first Biodiversity act was came on 19th and it was also contained the policies which were discussed at and put forward by the Convention on Biodiversity which was held in Rio de Janeiro 1992.

Amendment on Biodiversity act and now present Biodiversity act

and after that the Biodiversity



act was amended ~~was~~ and at present we have Biodiversity act 2023.

Present Biodiversity act, After Amendment

The present Biodiversity act works on the following principle.

- ① Conservation of the Nature and Natural resources.
- ② Sustainable use of the Resource.
- ③ Equitable and profitable profit sharing among the stakeholders.
- ④ ~~Less~~
- ④ Less paper work.
- ⑤ Digitalization of PBR.
- ⑤ Nagoya Protocol
- ⑥ AYUSH & 404A does not need any permission for using Biological resources for research.
- ⑦ Less compliance on the Herbal and medicinal companies.

Do Not Write anything in this Portion




① Conservation of Nature and Natural Resources

The conservation is important for the the & so that the overexploitation of the resources could not occur and the conservation of the the Nature and flora &

② Sustainable fauna is important different measures should be taken accordingly.

③ Sustainable use of the resources

The resources must be used sustainably so that future generation can also use those resources and take the the benefit.

eg:- a use of the fossil fuel if we ~~use~~  all the fossil fuel then it will not be left for future generations.

④ Equitable profit sharing

for example there is the CEO of the pharma company and he



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found out that at the certain forest contain drug & can be acquired and keep us and if know that according to government that at the forest first right is of ~~of~~ the people living there near by so. we ~~&~~ has to share profits gained by that drugs with people there or has to compensate in some way.

① the AYUSH (Ayurveda, Yoga, Unani, Siddha, Homeopathy) they do not need any permission for using biological resources they can use for the research.

① the ~~paper~~ ^{paper} work has been reduced so that ~~people~~ ^{foreign} and Indian people can easily use biological resources for research purposes.

the 3 tier system of the Authority has been made for the permission of the Biological Resources is at ① National level, at state level and at local level.



① National Authority

① NBA (National Biological/ Biodiversity Authority)

↳ the head is Prime Minister
↳ the foreign entities / companies has to take permission from here to access Biological resources.

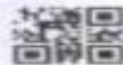
② the Indian people / company has to take permission from the state Biological Biodiversity Assembly for the access of biological resources.

③ there is also the local committee made by the government for the local biodiversity and its resources. its function is also to make PBR in which the traditional knowledge of the particular area is written.

• the emphasis is also made to digitize PBR so that people could access it easily and learn things. (PBR is a Register in which traditional knowledge about the plants/habitat there is written)



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Section → A

①

Answer A

The Red data Book was given by IUCN (International Union for Conservation of Nature and natural resources).

The Red data Book contains the information about the status of living beings which (flora) and (fauna) which are endangered & extinct.

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> → extinct → critically endangered → endangered → vulnerable → Near threatened → Least concern | <ul style="list-style-type: none"> → extinct → endangered |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|

The Red data book provides all this information. In the Red data Book there




is different color page for different category :-

Black → It refers to the flora/fauna which is extinct. (they are no more)

Amber / Orange → It refers to the flora/fauna which are critically endangered. (they are at huge risk; if proper measures will not be taken they can be extinct too)

White → the flora/fauna which is not at risk but it is endemic present at very narrow ^{geographical} area. No conservation is important

Green → the flora and fauna which were endangered before but due to several efforts (conservation) they are now safe and now out of danger.

Grey →  They are endangered/dangerous but sufficient information is not available



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Answer → B

Megadiversity centres are the centres where megadiverse biodiversity is high.

↳ there are 17 megadiversity centres in the world. ∴

and these are 17 countries have highest megadiversity on the earth.

CRITERIA
FOR
MEGADIVERSITY

① The Area must have 5000 vascular present

②

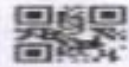
The Mega diverse area must have marine ecosystem present

the megadiverse countries are

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are important because most of the biological resource come from these countries.

Some megadiverse countries are given below:-

- India
- Australia
- South Africa
- Mexico
- China Philippines
- Madagascar
- Brazil ... etc.
- etc

Answer - C

The species diversity is the diversity (variation) ^{in species} that is found in the ~~the~~ ~~at~~ ecosystem. I.e., the ~~variety~~ variety of the species ~~and~~ in the ecosystem is called species diversity.

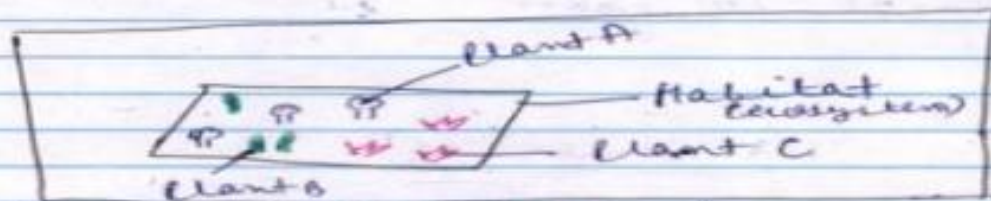
✓
An example for certain ecosystem is for instance here we take tropical forest three different types of



birds, animals, plants will be found that is species diversity.

There is ~~species richness~~ species richness
~~now more much of~~

and the variety of the species found in the ecosystem that is called species richness.



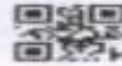
- ☐ → 3 (Plant A)
 - → 3 (Plant B)
 - ☐ → 3 (Plant C)
- } species richness

So, by a ✓ we can see that there is diversity in the species and the number of species A, B, C is equal so we can say that species stability is also high here.

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Answer D

Endemism is the presence of the certain flora/ fauna to a narrow geographical region. that they are not present anywhere else (mostly).

As per the quality of the of the endemic species is that they are definite to particular geographical area. as as if they can not migrate to any other area as if they do they will not be able to flourish there and can die.

so as endemic species are present in particular area only so it is very important to conserve them.

there are following types of endemic species :-

① Neo endemic species (Neoendemism)

the flora/ fauna is evolutionarily young and therefore it has not flourished or been present in different geographical areas.

Date

Page

Signature



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① Palaeoendemism (Palaeoendemic species) -

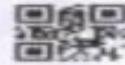
the species which was present in wide geographical area but now it is present only in narrow geographical area.

② Schizoendemism (Schizo endemic species)

the species which was endemic but has come from the genus ~~genus~~ species which is widely distributed.

Answer → E .

Dr. Madhu Lathar gave this was the one who introduced Van Mahotsav Mahotsav and asked people and to plant more and more trees so that more and more benefits could be taken from them. The Van Mahotsav is celebrated twice the year i.e., February and March. So that people feel enthusiastic to plant more and more trees.

Answer f

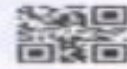
the conservation of the flora/fauna is in order so that the biodiversity can be preserved. It is very important to conserve the flora and fauna because its loss can give us the huge ~~impact~~ problems the consumption of the food will be reduced as no food will be there, ecosystem services will be reduced as there will be the destruction of the ecosystem so the biogeochemical cycle will also be not able to function properly so it is very important that we conserve the flora & fauna and our biodiversity.

Answer - G

the ~~net~~ ⁱⁿ are those which are present ~~at~~ ⁱⁿ the water is present around them ~~they are~~ ^{they are} present so there water ~~a~~ should be not ~~so~~ more than 7m at low tide. they are very helpful for our ecosystem as they are the first line of defence against tsunami maximum consumption food items is found there ~~they~~ ^{they} only, they filter water and ~~they~~



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Answering

Answer → 11

Shahed Chandra Shekhar Azad Bird Sanctuary is the Bird Sanctuary, the Sanctuaries in which there ~~is~~ no one can hunt birds or other fauna present. there no touching or hunting of the fauna is allowed. there the ecosystem is also protected and fauna is also ~~is~~ protected. ~~the~~ the ~~is~~ interference is not allowed. the ~~is~~ fauna is conserved there so that the ~~is~~ biodiversity is saved and ~~we~~ we can get the benefit of ecosystem services. different kinds of the birds are present in the Shahed Chandra Shekhar Azad Bird Sanctuary so aesthetic value is also there. ~~the~~ landscape is also aesthetic.

Do Not Write anything in this Portion



Answer I

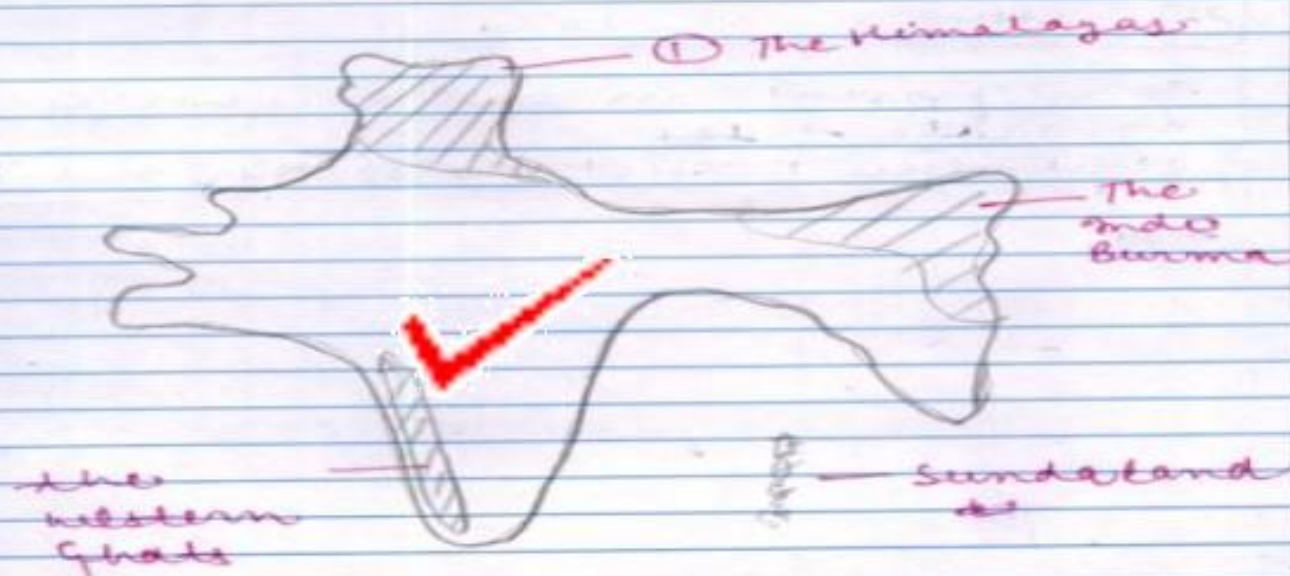
Hotspots are the areas that are protected because high biodiversity is found there.

The criteria for hotspots is -

- ↳ 1500 endemic species must be present there (vascular plants)
- ↳ 70% of the habitat is destroyed.

There are 36 hotspots present in the world.

In India four hotspots are present.



Hotspots of India

Do Not Write anything in this Portion



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1) The Himalayas

The Himalayas have diff different variations (types) of the ecosystems eg:- Alps, Conifers, grasslands etc.

2) The Western Ghats

The 30% of the Asiatic elephants & 17% of ~~the~~ tigers are present

3) The Indo-Burma

It is the largest hotspot present in India. Different kinds of flora & fauna is present there.

4) The Sunda Land

It is present in the Nicobar Island in India.

It is the hottest hotspot in India.

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