



Paper - II

Environmental Sciences

Booklet Code

A

SUBJECT CODE : 1 6
Roll No. :

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(Figures as per admission card)

Roll No. (in words) :

OMR Sheet No. :

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Name and Signature of Invigilator/s

Signature : _____

Name : _____

Time : 2 Hours

Maximum Marks : 200

Number of Pages in this Booklet : 16
Number of Questions in this Booklet : 100

Instructions for the Candidates

1. Write your roll number in the space provided on the top of this page.
2. This paper consists of hundred (100) multiple-choice type of questions.
3. At the commencement of examination, the test booklet will be given to you. In the first 5 minutes, you are requested **To Open the Booklet and Compulsorily Examine it as Below:**
 - (i) To have access to the Test Booklet, tear off the paper seal on the edge of the cover page. Do not accept a booklet without sticker seal or open booklet.
 - (ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Test Booklet will be replaced nor any extra time will be given.
 - (iii) After the verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
Example : Ⓐ Ⓑ ● Ⓓ
 where (C) is the correct response.
5. Your responses to the questions are to be indicated in the **OMR Sheet kept inside this Booklet**. If you mark at any place other than in the circles, the OMR Sheet will not be evaluated.
6. Read the instructions given in OMR Sheet carefully. Fill the Booklet Code of Paper-II in OMR Sheet **Compulsorily**.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space provided for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the OMR answer Sheet to the invigilators at the end of the examination compulsorily and must NOT carry it with you outside the Examination Hall.
10. You can take away test booklet and carbon copy of OMR Answer Sheet after the examination.
11. **Use only Blue/Black Ball point pen.**
12. **Use of any calculator, electronic gadgets or log table, etc. is prohibited.**
13. **There is no negative mark for incorrect answer.**





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1. Which one of the following is the largest and most uniform ecosystem ?
 (A) Fresh water ecosystem
 (B) Agro-ecosystem
 (C) Marine ecosystem
 (D) Forest ecosystem
2. 'Red Data Book' is published by :
 (A) UNEP
 (B) WWE
 (C) WHO
 (D) IUCN
3. What is the percentage of freshwater on Earth?
 (A) 97%
 (B) 89%
 (C) 5%
 (D) 3%
4. The molar absorptivity of a substance of a substance is $1.0 \times 10^4 \text{ cm}^{-1} \text{ mol}^{-1} \text{ dm}^3$. Calculate the transmittance through a cuvette of path length 2.0 containing $1.5 \times 10^{-6} \text{ mol dm}^{-3}$ solution of the substance.
 (A) 0.5
 (B) 1.2
 (C) 1.0
 (D) 0.3
5. Migration route of elephants from one habitat to another is called :
 (A) Corridor
 (B) Channel
 (C) Overpass
 (D) Underpass
6. The point of origin of the National River Ganga is :
 (A) Gomukh
 (B) Pindari Glacier
 (C) Yamnotri
 (D) Chaukhamba Peak
7. The 'Tehri Dam Project' is located on the River :
 (A) Alaknanda
 (B) Bhagirathi
 (C) Yamuna
 (D) Mandakini
8. Who introduced the term 'Keystone species' ?
 (A) Robert T. Paine
 (B) Eugene P. Odum
 (C) F.E. Clement
 (D) A.G. Tansley
9. What is the molecularity of the reaction?
 $2 \text{ CO} + \text{O}_2 \rightarrow 2 \text{ CO}_2$
 (A) Bimolecular
 (B) Termolecular
 (C) Unimolecular
 (D) Pseudo molecular
10. Which zone of a pond does not receive light?
 (A) Littoral
 (B) Limnetic
 (C) Profundal
 (D) Epilimnion



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11. In a spectrophotometer set at the $\lambda_{\max}$ of a sample the value of P_0 (with the solvent) was found to be 85.4 using cuvettes of 2.00 cm path length. The value of P for a solution of the sample having a concentration of 1×10^{-4} M was measured in the same cuvette and was found to be 20.3. calculate the molar absorptivity of the sample.
- (A) $3122 \text{ cm}^{-1} \text{ mol}^{-1} \text{ dm}^3$
 (B) $3120 \text{ cm}^{-1} \text{ mol}^{-1} \text{ dm}^3$
 (C) $3128 \text{ cm}^{-1} \text{ mol}^{-1} \text{ dm}^3$
 (D) $3121 \text{ cm}^{-1} \text{ mol}^{-1} \text{ dm}^3$
12. Which of the following devices is not used to control particulate emissions?
- (A) Electrostatic precipitator
 (B) Bag filters
 (C) Catalytic convertors
 (D) Trickling filters
13. Major aerosol pollutant in jet plane emission is :
- (A) Carbon monoxide
 (B) Methane
 (C) Fluorocarbons
 (D) Sulphur dioxide
14. What happens to an element when it undergoes (β) decay?
- (A) Its atomic number increases by 2.
 (B) Its mass number decreases by 4.
 (C) Its atomic number increases by 1, while its mass number remains unchanged.
 (D) Its atomic number decreases by 1, while its mass number remains unchanged.
15. Nuclear energy is generated by :
- (A) Nuclear fusion
 (B) Nuclear fission
 (C) Both by nuclear fusion and nuclear fission
 (D) Neither nuclear fusion nor fission
16. 3 day BOD of a waste water sample is 250 mg/L at 20°C . what is the 5 day BOD in mg/L at the same temperature? [K_d at $20^\circ\text{C} = 0.1$. Assume values $10^{(-0.3)} = 0.5$ and $10^{(-0.5)} = 0.316$]
- (A) 346
 (B) 442
 (C) 342
 (D) 242
17. Kaziranga National Park is famous for :
- (A) One horned Rhinoceros
 (B) Musk Deer
 (C) Tiger
 (D) Asian Elephant
18. Agenda-21 is the outcome of :
- (A) Bali Summit
 (B) Stockholm Conference
 (C) Earth Summit
 (D) Johannesburg Declaration
19. Average Solar incidence in India stands at a robust _____.
- (A) 8-10 kWh/sq. meter/day
 (B) 4-7 kWh/sq. meter/day
 (C) 12-13 kWh/sq. meter/day
 (D) 20 kWh/sq. meter/day


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20. Carrying capacity of an ecosystem is the :
 (A) Minimum population size that can be sustained indefinitely by the ecosystem
 (B) Moderate population size that can be sustained indefinitely by the ecosystem
 (C) Maximum population size that can be sustained indefinitely by the ecosystem
 (D) Average population size that can be sustained indefinitely by the ecosystem
21. Plastic industries are the major source of :
 (A) Air borne lead
 (B) Benzene hexachloride
 (C) Polychlorinated biphenols
 (D) Hydrocarbons
22. 'Photovoltaics' is the :
 (A) Technology that synthesises food in presence of sunlight
 (B) Technology that converts sunlight into electricity without using a solid semi-conductor material
 (C) Technology that converts sunlight directly into electricity using a solid semiconductor material
 (D) Device that can measure the flow of electricity
23. Burning of biomass results into formation of :
 (A) N_2O
 (B) NO
 (C) NO_3^-
 (D) N_2O , NO and NO_3^-
24. In India, tropical forests are found in :
 (A) Assam only
 (B) Andaman Islands only
 (C) Western Ghats only
 (D) Assam, Andaman Islands and Western Ghats
25. Largest living bird is :
 (A) Dodo
 (B) Ostrich
 (C) Albatross
 (D) Swift
26. 'World Population Day' is celebrated on :
 (A) 11 July
 (B) 5 June
 (C) 21 June
 (D) 16 September
27. Which is the National aquatic animal of India ?
 (A) Crocodile
 (B) Tortoise
 (C) Gangetic Dolphin
 (D) Mahseer
28. Ginkgo is known as :
 (A) Living fossil
 (B) Bird
 (C) Reptile
 (D) Fish
29. 'Project Tiger' was launched in the year :
 (A) 1973
 (B) 1975
 (C) 1980
 (D) 1985


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30. The 'Namami Gange Programme' was launched in the year :
- (A) 1980
(B) 1995
(C) 2014
(D) 2019
31. Who has forwarded the famous 'Gaia hypothesis'?
- (A) Richard Dawkins
(B) James Lovelock
(C) James Hutton
(D) Lewis Thomas
32. Who was the author of the famous book 'The Population Bomb'?
- (A) Frank Barnaby
(B) Eric Echolm
(C) Paul R. Ehrlich
(D) Eugene P. Odum
33. Which natural hazard is not very common in India?
- (A) Earthquake
(B) Floods
(C) Landslides
(D) Volcano
34. Which satellite recorded the presence of ozone hole for the first time ?
- (A) Nimbus-7
(B) Landsat-3
(C) MODIS IRS d-1A
(D) TRIOS-N
35. Which is the first National Park established in India ?
- (A) Periyar National Park
(B) Rajaji National Park
(C) Keola Deo National Park
(D) Jim Corbett National Park
36. Which one of the following is an intangible resource ?
- (A) Mahseer in mountain river
(B) Tuna fish in the ocean
(C) Dolphin in the Ganga
(D) The view of the Gulmarg Mountain peak
37. In which year, the Indus Water Treaty was signed between India and Pakistan ?
- (A) 1947
(B) 1950
(C) 1960
(D) 1965
38. Accumulation of non-biodegradable pesticides in the food chain is called :
- (A) Bioremediation
(B) Biomagnification
(C) Detoxification
(D) Phytoremediation
39. Which of the following types of coal has maximum carbon and calorific value ?
- (A) Anthracite (hard coal)
(B) Bituminous (Soft coal)
(C) Lignite (Brown coal)
(D) Wood coal


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40. Maximum depletion of Ozone layer was observed on the :
- (A) Equator
(B) North Pole
(C) South Pole
(D) Tropics
41. The average thickness of the continental crust is about
- (A) 5-15 km
(B) 15-25 km
(C) 25-35 km
(D) 35-45 km
42. Coal deposits are formed due to :
- (A) Thermal metamorphism of organic source material
(B) Accumulation of vegetation in a proper sedimentary environment and its subsequent bio-chemical-mechanical transformation
(C) Some undefined igneous process which is yet to be understood
(D) Metamorphism of carbonaceous rocks
43. An aquifer is a rock formation which is:
- (A) Porous and not necessarily permeable
(B) Highly porous and impermeable
(C) Highly impermeable
(D) Porous and essentially permeable
44. Seismic waves are recorded on :
- (A) Cardiogram
(B) Seismogram
(C) Hydrograph
(D) Barometer
45. Ground water is defined as:
- (A) All the water which occurs in the pores of soil and rocks below the surface of the ground
(B) All that water which occurs above the water table below the surface
(C) All the water which occurs below the water table in the pores and openings of rocks which are fully saturated with it
(D) All the water lies on the ground surface
46. Which of the following is not a transported soil ?
- (A) Colluvial soil
(B) Eolian soil
(C) Lacustrine soil
(D) Alluvial soil
47. Lapse rate is :
- (A) The rate the atmosphere lapses
(B) The rate at which the atmospheric temperature changes with height
(C) The rate at which the atmospheric temperature rises
(D) The rate of losing earth mass
48. The Ozone layer is located in :
- (A) The troposphere
(B) The ionosphere
(C) The exosphere
(D) The stratosphere


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49. Spatial resolution of IRS 1D LISS III image is :
 (A) 1 m
 (B) 30 m
 (C) 80 m
 (D) 23.5 m
50. Geosynchronous satellite means :
 (A) An orbital period same as the Earth's rotation period
 (B) An orbital period is different from Earth's rotation
 (C) An orbital rotation similar to Sun
 (D) An orbital rotation similar to Moon
51. In an ecosystem, the flow of energy is :
 (A) Unidirectional
 (B) Bidirectional
 (C) Multidirectional
 (D) Cyclic
52. Trophic levels are formed by :
 (A) Only plants
 (B) Only animals
 (C) Only carnivores
 (D) Food chain linked organisms
53. Which kind of pyramid can never be inverted in any stable ecosystem ?
 (A) Biomass
 (B) Energy
 (C) Number
 (D) Biomass, Energy and Number
54. ENSO stands for :
 (A) El Niño Surface Oscillation
 (B) El Niño Southern Ocean
 (C) El Niño Southern Oscillation
 (D) El Niño Surfing Organization
55. Which one of the cities was declared cleanest in the Swachh Sarvekshan 2021 ?
 (A) Jaipur
 (B) Dehradun
 (C) Indore
 (D) Jammu
56. Flood hydrograph is the expression of :
 (A) Graph of flood water
 (B) Time and discharge relationship of flood water
 (C) Flood level in an area
 (D) Flood duration
57. Landslide is downslope movement of rock and soil mass under the influence of :
 (A) Slope
 (B) Gravity
 (C) Water
 (D) Soil
58. In India avalanches are mainly reported from the hilly region of the :
 (A) Aravalli mountains
 (B) Eastern Ghat
 (C) Western Ghat
 (D) Himalaya
59. Spatial resolution of Landsat 1 TM sensor is for visible, near-infrared and mid-infrared wavelengths:
 (A) 30 m
 (B) 23.5 m
 (C) 5 m
 (D) 0.61 m



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60. Resourcesat-1 is also known as :
 (A) IRS-P6
 (B) Land-8
 (C) Oceansat
 (D) Cartosat
61. Line, polygon, vector and raster terms are used in :
 (A) GPS
 (B) GIS
 (C) RS
 (D) SOI toposheet
62. Identify the correct sequence of natural surfaces according to their albedo:
 (a) Ocean
 (b) Fresh snow
 (c) Grass
 (d) Desert Sand
 Choose the correct answer from the options given below:
 (A) $a < b < c < d$
 (B) $c < a < d < b$
 (C) $c < a < b < d$
 (D) $a < c < d < b$
63. Western Ghats are very rich in endemic species of :
 (A) Birds
 (B) Mammals
 (C) Amphibians
 (D) Fishes
64. Eco-mark of our country is :
 (A) Earthen pitcher
 (B) Giant Panda
 (C) Hornbill
 (D) Tulip leaves
65. Estuaries have the following characteristics :
 i. Freshwater and salt water
 ii. Low biodiversity
 iii. Low productivity
 iv. Rich biodiversity and high productivity
 Choose the correct answer :
 (A) i, ii and iii
 (B) i, ii and iv
 (C) ii, iii and iv
 (D) i and iv
66. Assertion A: Himalayan states of India have greater hydropower potential
Reason R: Hills provide an altitudinal gradient for the construction of dams.
 Choose the correct answer :
 (A) Both A and R are true, and R is the correct explanation of A
 (B) Both A and R are true, but R is NOT the correct explanation of A
 (C) A is true but R is false
 (D) A is false but R is true
67. Dissolved oxygen in the water comes from :
 (A) Photosynthesis of aquatic plants only
 (B) Atmosphere only
 (C) Photosynthesis of aquatic plants and atmosphere
 (D) Comes from Lithosphere only



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68. Which of the following has maximum penetration power ?
 (A) Alpha particle
 (B) Beta particle
 (C) Gamma rays
 (D) Alpha particle and Beta particle
69. Match column I with column II and select correct answer using answer codes :
- | | Column I | | Column II |
|----|-------------|---|---------------------|
| P. | Earth worms | 1 | Producer |
| Q. | Grass | 2 | Secondary carnivore |
| R. | Frogs | 3 | Primary Carnivore |
| S. | Hawks | 4 | Detritivore |
- (A) 4 1 2 3
 (B) 2 3 4 1
 (C) 3 4 1 2
 (D) 4 1 3 2
70. Which one of the following is the largest nekton?
 (A) Comb Jelly
 (B) Baleen Whale
 (C) Copepod
 (D) Sowbug
71. Assertion (a): Temperature in stratosphere increases with increase in altitude
Reason (r): Photodissociation of O_2 in stratosphere makes the lapse rate positive
 Choose the correct answer:
 (A) Both (a) and (r) are true, and (r) is the correct explanation of (a)
 (B) Both (a) and (r) are true, but (r) is not the correct explanation of (a)
 (C) (a) is true but (r) is false
 (D) (a) is false but (r) is true
72. The first man-made ecosystems are :
 (A) Villages
 (B) Agroecosystems
 (C) Water Tanks
 (D) Orchards
73. Under ideal conditions, the COD/ TOC ratio for sewage containing only organic matter is _____.
 (A) 2.66
 (B) 0.375
 (C) 1.66
 (D) 0.5
74. Chemosynthetic sulphur bacteria form the food base in :
 (A) Estuaries
 (B) Coral reefs
 (C) Hydrothermal vents
 (D) Salt marshes
75. The single most significant factor to limit plant distribution and abundance is :
 (A) Light
 (B) Temperature
 (C) Rainfall
 (D) Humidity



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76. The BOD of a town is 25,000 kg/day and BOD per capita per day is 50 gram. The population equivalent of the town is _____.
 (A) 10,000
 (B) 50,000
 (C) 25,0000
 (D) 50,0000
77. The first marine biosphere reserve established in India is :
 (A) Sundarbans Biosphere Reserves
 (B) Similipal Biosphere Reserve
 (C) Gulf of Mannar Biosphere Reserve
 (D) Great Nicobar Biosphere Reserve
78. Match column I with column II and select the correct answer using answer codes :

	Column I		Column II
P.	World Environment Day	1	June 5
Q.	International Biodiversity Day	2	September 16
R.	International Ozone Day	3	May 22
S.	Mother Earth Day	4	April 22

	P	Q	R	S
(A)	4	3	1	2
(B)	2	1	4	3
(C)	1	3	2	4
(D)	3	1	4	2
79. The Brundtland Commission Report was entitled :
 (A) Limits to Growth
 (B) Our Common Future
 (C) Sustainable Development
 (D) Tragedy of Commons
80. Hyporheic biodiversity is associated with :
 (A) Surface water
 (B) Ecotone of surface water and groundwater
 (C) Ecotone of terrestrial and aquatic ecosystem
 (D) Groundwater
81. Consider the following statements regarding organic carbon estimation following Walkley and Black method:
 i. Organic carbon estimated by this method excludes most of the less active organic matter
 ii. 100% of the total oxidizable organic carbon is oxidized in this method
 iii. Soil organic matter percentage can be calculated by multiplying the estimated organic carbon percentage by 1.724
 iv. K_2SO_4 and H_2SO_4 are used as reagents
 Choose the most appropriate answer from the options given below:
 (A) ii and iv Only
 (B) i and ii Only
 (C) i and iii Only
 (D) ii and iii Only



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82. Simson's Index is a useful tools for measuring :

- (A) Air pollution
- (B) Soil quality
- (C) Species diversity
- (D) Water quality

83. Match List I with List II and select the correct answer from the codes given below:

List I (Hydropower projects)		List II (River)	
P.	Sardar Sarovar Project	1.	Bhagirathi River
Q.	Tehri Dam project	2.	Narmada River
R.	Pong Dam	3.	Mahanadi River
S.	Hirakund Dam	4.	Beas River

Choose the correct answer from the options given below:

Codes:

- | | P | Q | R | S |
|-----|---|---|---|---|
| (A) | 1 | 2 | 4 | 3 |
| (B) | 4 | 3 | 2 | 1 |
| (C) | 3 | 4 | 1 | 2 |
| (D) | 2 | 1 | 4 | 3 |

84. The validity of Environment Clearance (EC) for any hydropower project is :

- (A) 5 years
- (B) 10 years

- (C) 15 years
- (D) 30 years

85. Who conducts the Public Hearing related with EIA on any developmental project in the state ?

- (A) Central Pollution Control Board
- (B) State Pollution Control Board
- (C) State EIA Authority
- (D) Central Biodiversity Authority

86. Article 48A of Indian Constitution is related with :

- (A) Duty of the citizen protecting environment
- (B) Directive Principle of the State Policy for protecting its environment
- (C) Fundamental right of life
- (D) Fundamental right of property

87. Crenobiodiversity is associated with the biodiversity dwelling the :

- (A) Brackish water
- (B) Marine water
- (C) Springs
- (D) Reservoirs

88. Fly Ash is the waste generated by :

- (A) Hydropower plants
- (B) Thermal power plants
- (C) Geothermal plants
- (D) Wind mills


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89. Industrial area should have the noise level of during daytime as prescribed by CBCB.
- (A) 50 dB
(B) 75 dB
(C) 90 dB
(D) 70 dB
90. The area upto 100 metres around premises of hospitals and educational institutions is known as :
- (A) Sensitive zone
(B) Silence zone
(C) No traffic zone
(D) GT Road
91. India became party to CITES in the year:
- (A) 1976
(B) 1972
(C) 1974
(D) 1986
92. The Environmental Protection Act 1986 came into force on :
- (A) 19 November
(B) 2 October
(C) 14 November
(D) 30 June
93. The type of succession which originates on a bare rock, lacking water and organic matter is known as :
- (A) Xerosere
(B) Hydrosere
(C) Lithosere
(D) Halosere
94. Carbon monoxide is harmful to human beings, as it is :
- (A) Carcinogenic
(B) Antagonistic to CO_2
(C) Destructive to O_3
(D) Having high affinity with haemoglobin as compared to oxygen
95. A population broken into sets of sub-populations held together by dispersal or movements of individuals among them is called :
- (A) Indigenous population
(B) Meta population
(C) Nomadic population
(D) Original population
96. Calculate the values of the standard deviation for the following 10 values of distribution :
12:11: 14:15:18:17:19:20:21 and 13
- Correct value is :
- (A) 2.16
(B) 3.16
(C) 4.16
(D) 5.16



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97. Following are the statements related with the Lotka-Volterra model :

- i. This model is also known as predator and prey interaction model
- ii. The prey consumption rate by a predator is directly proportional to the prey abundance
- iii. The consumption rate by a predator is inversely proportional to prey abundance
- iv. A simple mathematical model of inter specific competition which is not stable

Choose the correct statement:

- (A) i, ii, iii and iv
- (B) i, ii and iv
- (C) ii, iii and iv
- (D) i, iii and iv

98. Assertion (a): There is a general pattern of increase in biodiversity from equator to poles.

Reason (r): Due to the high level of energy received in the tropics, higher is the net primary production which in turn supports a large number of individuals, leading to high biodiversity.

Choose the correct answer:

- (A) Both (a) and (r) are true and (r) is correct explanation of (a)
- (B) Both (a) and (r) are true and (r) is not correct explanation of (a)
- (C) (a) is true, but (r) is false
- (D) (a) is false, but (r) is true

99. The Leslie's matrix model is a useful tool :

- i. To evaluate how the composition of the population changes over the time
- ii. It has nothing to do with the population changes over the time
- iii. A discrete, age structured model of population growth
- iv. It is very useful mathematical model in population ecology

Choose the correct answer:

- (A) i, iii, and iv
- (B) ii, iii and iv
- (C) i, ii and iii
- (D) i, ii and iv

100. The Yamuna Action Plan the bilateral project between the Govt. of India and Japan, introduced in the year :

- (A) 1990
- (B) 1993
- (C) 1994
- (D) 2014



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