

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA, VADODARA

Ph. D. ENTRANCE TEST (PET) – 27th January 2019

Signature of Invigilators

Environmental Sciences
(19/30)

Roll No.

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(in figures as in Hall Ticket)

Roll No. _____

(in words)

Maximum Marks: 50

No. Of Printed Pages : 8

Instruction for the Candidate:

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of **FIFTY (50)** multiple choice type questions. Each Question carries **ONE (1)** mark.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below:
 - a. To have access to the Question Booklet, tear off the paper seal on the edge of this cover page, Do not accept a booklet without sticker seal and do not accept an open booklet.
 - b. Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faculty 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 Question Booklet will be replaced nor any extra time will be given.
 - c. After this verification is over, the Test Booklet Number should be entered on the OMR Answer Sheet and the OMR Answer 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: (A) ● (C) (D) where (B) is correct response.
5. Your responses to the items are to be indicated on the OMR Answer Sheet under Paper – II only. If you mark your response at any place other than in the circle in the OMR Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
9. You have to return the original OMR Answer Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Answer Sheet on conclusion of examination
10. Use only Blue/ Black Ball point pen.
11. Use of any calculator or log table etc., is prohibited.
12. There shall be no negative marking.

Environmental Sciences

(19/30)

Note: This paper contains **FIFTY (50)** multiple-choice questions. Each Question carries **ONE (1)** mark.

- 01) Air Quality Index does not measure _____.
A) Ozone
B) Fine particulate matter
C) Sulphur dioxide
D) Methane
- 02) Vehicular pollution can be reduced due to which of the following? -
A) Diesel
B) petrol
C) Kerosene
D) catalytic converter
- 03) Metal ion pollutant can readily be determined with the help of _____ technique.
A) IR
B) AAS
C) XRD
D) NMR
- 04) What should be the minimum thickness of plastic carry-bags by law?
A) 10 microns
B) 20 microns
C) 40 microns
D) 50 microns
- 05) Which among the following is not an Indian biodiversity hot spot?
A) North-eastern states
B) The Western Ghats
C) Himalayas
D) Gir forest
- 06) Which of the following transition metals is found in highest concentration in earth crust?
A) nickel
B) chromium
C) copper
D) zinc
- 07) The molecular weight of phenol is 94. How much of phenol is required for preparing 10 ppm one litre solution?
A) 9.4 mg
B) 10 mg
C) 94 mg
D) 94 μg
- 08) Which of the following is an *in situ* conservation?
A) arboretum
B) botanical garden
C) biosphere
D) orchidarium
- 09) Which is the most abundant greenhouse gas in the earth's atmosphere?
A) CH_4
B) CO_2
C) H_2O
D) SO_2
- 10) The major source of SO_2 pollution among the following is _____.
A) cement industry
B) wild fire
C) thermal power station
D) active volcano
- 11) Which among the following contributes in transforming soil nitrates into free nitrogen?
A) cattle
B) birds
C) bacteria
D) human
- 12) Which of the following is found in Narayan Sarovar Sanctuary?
A) chinkara
B) black buck
C) wild ass
D) sloth bear

- 13) Decay of what results in generation of argon found in Earth atmosphere?
- Ca-40
 - K-40
 - Na-23
 - Sc-44
- 14) Which of the following causes the Black Foot disease?
- Mercury
 - Arsenic
 - Chromium
 - Lead
- 15) The wavelength of visible light is _____ nm.
- 390- 750
 - 300 – 700
 - 280 – 340
 - 400-800
- 16) Where was the India's first national centre for marine biodiversity established?
- Jamnagar
 - Bhavnagar
 - Rameswaram
 - Visakhapatnam
- 17) Which of the following radio isotopes has the shortest half life among them?
- ^{131}I
 - ^{137}Cs
 - ^{14}C
 - ^{90}Sr
- 18) What is the source of bagasse?
- Jute
 - Soft hemp
 - Sheep
 - Sugar cane
- 19) What is formed on reaction of sulphuric acid on marble?
- quick lime
 - gypsum
 - calcium chloride
 - calcium hydroxide
- 20) Withdrawal of US from which treaty was announced by president Trump?
- Stockholm
 - Kyoto
 - Paris
 - Amsterdam
- 21) What happens to the degree of dissociation, α , when a salt is added to a solution of another salt having same ion?
- increases
 - decreases
 - unaffected
 - can't be predicted
- 22) Which is an acid according to the Bronsted-Lowry concept?
- acceptor of a proton
 - donor of a proton
 - acceptor of electrons
 - acceptor of electrons
- 23) Which part of the body is affected due to fluorosis?
- eyes
 - teeth
 - heart
 - lungs
- 24) What is the nature of the conjugate acid of a weak base?
- strong
 - weak
 - neutral
 - weaker
- 25) Which of the following states has the maximum forest cover?
- Manipur
 - Kerala
 - Gujarat
 - Mizoram

- 26) What caused the Bhopal gas tragedy?
 A) Chlorine
 B) methyl isocyanide
 C) phosgene
 D) hydrogen chloride
- 27) How much of the total atmospheric ozone is estimated to be present in the troposphere?
 A) 10 %
 B) 20 %
 C) 30 %
 D) 50 %
- 28) To which of the following coastal regions are highly vulnerable?
 A) Earthquake
 B) Landslide
 C) Tsunami
 D) Forest fire
- 29) Which law relates concentration and absorbance in a UV-vis absorption spectrum?
 A) Beers
 B) Lambert
 C) Gregory
 D) Johnson
- 30) Which of the following pollutant in drinking water causes the 'blue baby syndrome'?
 A) oxygen
 B) fluoride
 C) nitrate
 D) mercury
- 31) Which of the following sources of electricity is a pollution free energy source?
 A) Hydro power
 B) Thermal power
 C) Nuclear power
 D) Diesel electric generator
- 32) Which one is the process of risk transfer?
 A) Accident
 B) Hazard Management
 C) Insurance
 D) Communication regarding a disaster
- 33) The international efforts made to have household eco-friendly refrigerators are known as:
 A) Kyoto protocol
 B) Basal convention
 C) Montreal protocol
 D) Paris agreement
- 34) Culture of which bacteria is given priority in groundnut cultivation?
 A) *Rhizobium*
 B) Phosphobacteria
 C) Mycorrhiza
 D) *Azospirillum*
- 35) How much of HCl is present in its solution with pH=1?
 A) 3.65 g lit⁻¹
 B) 0.365 g lit⁻¹
 C) 1.0 g lit⁻¹
 D) 36.5 g lit⁻¹
- 36) What is the major portion in the municipal solid waste in developing countries?
 A) Glass waste
 B) Paper waste
 C) Plastic waste
 D) Organic waste
- 37) Which makes the biodegradation of plant materials slow?
 A) lignine
 B) cellulose
 C) xylem
 D) lignin
- 38) How the radioactive waste is disposed?
 A) buried in ground
 B) by igniting
 C) sinking in sea water
 D) treating with heavy water
- 39) Which of the following gases is not found in high temperature volcanic eruptions?
 A) NO_x
 B) CO₂
 C) SO₂
 D) H₂S

- 40) Which of the following is critically endangered species?
 A) House sparrow
 B) hangul deer
 C) Black buck
 D) Kingfisher
- 41) The resource which is unlimited and is not degraded is known as _____.
 A) reusable
 B) renewable
 C) immutable
 D) non-renewable
- 42) When is the world environment day observed?
 A) 5th June
 B) 22nd April
 C) 26th January
 D) 8th March
- 43) To which is the Blue Revolution related?
 A) grain production
 B) fish production
 C) milk production
 D) pulse production
- 44) Which of the following species of earthworms is not used for vermicomposting?
 A) *Ascaris sp.*
 B) *Lumbricus sp.*
 C) *Eisenia sp.*
 D) *Eudrilus sp.*
- 45) Which of the following festivals contribute most to water pollution?
 A) Diwali
 B) Navaratri
 C) Ganesh/Durga pooja
 D) Holi
- 46) What is degradation of pesticides by soil microorganisms called?
 A) biotransformation
 B) bio-mineralization
 C) bio-augmentation
 D) bio-magnification
- 47) Which is the catalyst in a catalytic converter in vehicular exhaust?
 A) copper
 B) iron
 C) tungsten
 D) palladium
- 48) Which of the following treatments refer to secondary treatment of waste water?
 A) Physical
 B) Chemical
 C) Biological
 D) Disinfection
- 49) Which institute assess the forest cover in India?
 A) Indian Institute of remote sensing
 B) Forest survey of India
 C) Indian Institute of Forest management
 D) Forest research Institute Dehradun
- 50) Which of the following groups does not have chelation with metal ions?
 A) carboxylic
 B) phenol
 C) methyl
 D) formyl
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Rough Work:

