

UNIVERSITY OF MYSORE

Ph.D. Entrance Examination, November - 2020



SUBJECT CODE :

25

QUESTION BOOKLET NO.

503620

Entrance Reg. No.

QUESTION BOOKLET

(Read carefully the instructions given in the Question Booklet)

SUBJECT :

ENVIRONMENTAL SCIENCE

MAXIMUM MARKS : 100

MAXIMUM TIME : THREE HOURS

(Including initial 10 minutes for filling O.M.R. Answer sheet)

INSTRUCTIONS TO THE CANDIDATES

1. The sealed questions booklet containing 50 questions enclosed with O.M.R. Answer Sheet is given to you.
2. Verify whether the given question booklet is of the same subject which you have opted for examination.
3. Open the question paper seal carefully and take out the enclosed O.M.R. Answer Sheet outside the question booklet and fill up the general information in the O.M.R. Answer sheet. If you fail to fill up the details in the form of alphabet and signs as instructed, you will be personally responsible for consequences arising during scoring of your Answer Sheet.
4. During the examination:
 - a) Read each question carefully.
 - b) Determine the Most appropriate/correct answer from the four available choices given under each question.
 - c) Completely darken the relevant circle against the Question in the O.M.R. Answer Sheet. For example, in the question paper if "C" is correct answer for Question No.8, then darken against Sl. No.8 of O.M.R. Answer Sheet using Blue/Black Ball Point Pen as follows:

Question No. 8. (A) (B) (C) (D) (Only example) (Use Ball Pen only)

5. Rough work should be done only on the blank space provided in the Question Booklet. Rough work should not be done on the O.M.R. Answer Sheet.
6. If more than one circle is darkened for a given question, such answer is treated as wrong and no mark will be given. See the example in the O.M.R. Sheet.
7. The candidate and the Room Supervisor should sign in the O.M.R. Sheet at the specified place.
8. Candidate should return the original O.M.R. Answer Sheet and the university copy to the Room Supervisor after the examination.
9. Candidate can carry the question booklet and the candidate copy of the O.M.R. Sheet.
10. The calculator, pager and mobile phone are not allowed inside the examination hall.
11. **If a candidate is found committing malpractice, such a candidate shall not be considered for admission to the course and action against such candidate will be taken as per rules.**

INSTRUCTIONS TO FILL UP THE O.M.R. SHEET

1. There is only one most appropriate/correct answer for each question.
2. For each question, only one circle must be darkened with BLUE or BLACK ball point pen only. Do not try to alter it.
3. Circle should be darkened completely so that the alphabet inside it is not visible.
4. Do not make any stray marks on O.M.R. Sheet.

ಗಮನಿಸಿ : ಸೂಚನೆಗಳ ಕನ್ನಡ ಆವೃತ್ತಿಯು ಈ ಪುಸ್ತಕದ ಹಿಂಭಾಗದಲ್ಲಿ ಮುದ್ರಿಸಲ್ಪಟ್ಟಿದೆ.

PART - A

This part shall contains 50 multiple choice/objective type questions, each question carrying one mark [50 × 1 = 50]

- 1) Photochemical smog occurs in warm, dry and sunny climate. One of the following is not amongst the components of photochemical smog, identify it.
(A) NO_2 (B) O_3
(C) SO_2 (D) Unsaturated hydrocarbon

- 2) Which of the following gases is not a green house gas?
(A) CO (B) O_3
(C) CH_4 (D) H_2O vapour

- 3) Biochemical Oxygen Demand, (BOD) is a measure of organic material present in water. BOD value less than 5 ppm indicates a water sample to be _____.
(A) Rich in dissolved oxygen.
(B) Poor in dissolved oxygen.
(C) Highly polluted,
(D) Not suitable for aquatic life

- 4) The acid which is not present in acid rain is _____.
(A) Peroxyacetylnitrate (B) H_2CO_3
(C) HNO_3 (D) H_2SO_4

- 5) Which of the following statements is correct?
(A) Ozone hole is a hole formed in stratosphere from which ozone oozes out.
(B) Ozone hole is a hole formed in the troposphere from which ozone oozes out.
(C) Ozone hole is thinning of ozone layer of stratosphere at some places.
(D) Ozone hole means vanishing of ozone layer around the earth completely.

- 6) A volcano which is composed of lava flows and pyroclastic material and which is steep-sided and very tall is known as:
- (A) Syncline
 - (B) Composite cone
 - (C) Anticline
 - (D) None of these
- 7) In geological studies, a dome shaped intrusion is called a
- (A) Volcanic neck
 - (B) Laccolith
 - (C) Nueeardente
 - (D) Caldera
- 8) Which of the following minerals is NOT a silicate?
- (A) Orthoclase
 - (B) Muscovite
 - (C) Augite
 - (D) Magnetite
- 9) The name of a rapid rise of coastal water that accompanies the arrival of a cyclone is called:
- (A) Hurricane
 - (B) Storm surge
 - (C) Tidal wave
 - (D) Cyclonistat
- 10) Molten rock beneath the Earth's crust is called:
- (A) Magma
 - (B) Liquicite
 - (C) Lava
 - (D) Igneous

- 11) Environmental Biotechnology involves
- (A) The use of microbes to clean up the environment
 - (B) Bioremediation
 - (C) The study of benefits and hazards associated with GMMS
 - (D) All of these
- 12) The use of living organism to degrade environmental pollutants is called
- (A) Micro remediation
 - (B) Nano remediation
 - (C) Bioremediation
 - (D) All of these
- 13) Which of the following bacterium is called as the superbug that could clean up oil spills
- (A) *Bacillus subtilis*
 - (B) *Pseudomonas putida*
 - (C) *Pseudomonas denitrificans*
 - (D) *Bacillus denitrificans*
- 14) The process of extracting metal from ore bearing rock is called
- (A) Bio extraction
 - (B) Microbial extraction
 - (C) Bio filtration
 - (D) Bio leaching
- 15) The process of converting environmental pollutants into harmless products by naturally occurring microbes is called
- (A) Exsitu bioremediation
 - (B) Intrinsic bioremediation
 - (C) Extrinsic bioremediation
 - (D) None of these

- 16) Exsitu bioremediation involves the
- (A) Degradation of pollutants by microbes directly
 - (B) Removal of pollutants and collection at a place to facilitate microbial degradation
 - (C) Degradation of pollutants by genetically engineered microbes
 - (D) None of these
- 17) Which of the following microbe is widely used in the removal of industrial wastes
- (A) *Trichoderma sp.*
 - (B) *Aspergillus niger*
 - (C) *Pseudomonas putida*
 - (D) All of these
- 18) Microorganisms remove metals by
- (A) Adsorption and complexation
 - (B) Adsorption and precipitation
 - (C) Adsorption and volatilization
 - (D) All of these
- 19) *Chlorella sp.* are widely used in the removal of
- (A) Organic wastes
 - (B) Hydrocarbons
 - (C) Heavy metals
 - (D) All of these
- 20) A non directed physico chemical interaction between heavy metal ions and microbial surface is called
- (A) Biotransformation
 - (B) Bioconversion
 - (C) Biosorption
 - (D) Bio mining

- 21) What is the order of waste management hierarchy, from most to least favoured
- (A) Prevention- Recycle-Reuse- Disposal
 - (B) Prevention-Reuse-Disposal-Recycle
 - (C) Prevention-Disposal -Reuse-Recycle
 - (D) Prevention-Reuse-Recycle-Disposal
- 22) How do you remove leachate from the landfill?
- (A) By Gravity
 - (B) By pumping from low points
 - (C) Both (A) and (B)
 - (D) None of the above
- 23) Which of the following statement regarding recycling is wrong?
- (A) Saves precious resources
 - (B) Require stable market
 - (C) Improves efficiency of treatment processes
 - (D) Increases the needs for mining virgin materials
- 24) What is the most expensive component of solid waste handling?
- (A) Collection
 - (B) Storage
 - (C) Treatment
 - (D) Separation
- 25) What is the process flow in a integrated solid waste management system?
- (A) Generation-Source separation- facility separation-collection- Transfer and transport-Landfill
 - (B) Generation-Source separation-collection- Transfer and transport -facility separation-Landfill
 - (C) Generation-Source separation-collection-facility separation-Transfer and transport-Landfill
 - (D) Generation-Source separation-collection- Landfill -facility separation Transfer and transport

- 26) Ergonomic hazards are caused by _____.
- (A) Poorly designed tools
 - (B) Machinery
 - (C) Chemicals
 - (D) Electricity
- 27) Hazards due to agricultural machinery are _____.
- (A) Electrical
 - (B) Mechanical
 - (C) Chemical
 - (D) None of these
- 28) Common symptoms of pesticide poisoning are:
- (A) Headache
 - (B) Vomiting and nausea
 - (C) Difficulty in respiration
 - (D) All of the above
- 29) To prevent hazards at workplace, the following material should be put in place:
- (A) SDS
 - (B) First aid kit
 - (C) Protective clothing
 - (D) All of the above
- 30) Protective and safety equipment comprise:
- (A) Gas mask
 - (B) Gloves
 - (C) Both A and B
 - (D) None of the above

- 31) An ecosystem must have continuous external source of
- (A) Minerals
 - (B) Energy
 - (C) Food
 - (D) All of the above
- 32) Species that occur in different geographical regions separated by special barrier are:
- (A) Allopatric
 - (B) Sympatric
 - (C) Sibling
 - (D) None of the above
- 33) A population is a group of
- (A) Individuals in a species
 - (B) Species in a community
 - (C) Communities in an ecosystem
 - (D) Individuals in a family
- 34) The carrying capacity of a population is determined by its
- (A) Population growth rate
 - (B) Natality
 - (C) Mortality
 - (D) Limiting resources
- 35) Algal bloom results in
- (A) Global warming
 - (B) Salination
 - (C) Eutrophication
 - (D) Biomagnification
- 36) Remote sensing techniques make use of the properties of _____ emitted, reflected or diffracted by the sensed objects:
- (A) Electric waves
 - (B) Sound waves
 - (C) Electromagnetic waves
 - (D) Wind waves

- 37) The National Disaster Management Authority (NDMA) is headed by
(A) Prime Minister of India
(B) President of India
(C) Governor of States
(D) Chief Minister of States
- 38) Volcanoes are generally found where
(A) Intraplates pull apart or are coming together
(B) Tectonic plates pull apart or are coming together
(C) Earth's crust pull apart or are coming together
(D) None of these pull apart or are coming together
- 39) Cyclones occurring in North Atlantic ocean are called
(A) Typhoon (B) Hurricanes
(C) Tornado (D) None of the above
- 40) Disaster Management includes:
(A) Mitigation (B) Reconstruction
(C) Rehabilitation (D) All of the above
- 41) A species restricted to a given area is
(A) Endemic species (B) Allopatric species
(C) Sympatric species (D) Sibling species
- 42) An example of ex-situ conservation is
(A) Seed bank (B) Sacred groves
(C) National parks (D) Wildlife Sanctuary
- 43) Conservation of species in its natural habitat is
(A) In-situ (B) Ex-situ
(C) In-vitro (D) Both (B) and (C)

- 44) Biodiversity Hot spots are regions of high
(A) Rarity (B) Endemism
(C) Critically endangered population (D) Diversity
- 45) Sacred grooves are
(A) Community protected forest (B) Naturally protected forest
(C) Tourism spots (D) Boundary of Protected areas
- 46) The Environmental (Protection) Act was enacted in the year:
(A) 1986 (B) 1992
(C) 1984 (D) 1974
- 47) The power to declare an area as a sanctuary or national park of central Government is Wildlife (Protection) Act is under:
(A) Section 38 (B) Section 39
(C) Section 18 (D) Section 27
- 48) The Water (Prevention and Control of Pollution) Act was enacted in the year:
(A) 1986 (B) 1974
(C) 1994 (D) 1975
- 49) EIA is necessary because?
(A) Development is bad for the environment
(B) There is growing interest in sustainability
(C) Environmental impacts of developments are of public interest
(D) None of the above
- 50) The primary reason for Environmental Impact Assessment is to
(A) Mitigate existing environmental impacts of development
(B) Predict the size of impacts of developments
(C) Describe proposed developments
(D) Identify the environmental consequences of development in advance

PART - B

This part shall contains five questions, each question carrying ten marks.

[5 × 10 = 50]

1. Write a note on effects of heavy metal pollution on biota.
2. Describe microbes as bio indicators of pollution.
3. Explain the management of hazardous wastes.
4. Explain the application of GIS in environmental Monitoring.
5. Describe the various causes for depletion of biodiversity in India.



ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಜೊತೆಗೆ 50 ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿರುವ ಮೊಹರು ಮಾಡಿದ ಪ್ರಶ್ನೆ ಪುಸ್ತಕವನ್ನು ನಿಮಗೆ ನೀಡಲಾಗಿದೆ.
2. ಕೊಟ್ಟಿರುವ ಪ್ರಶ್ನೆ ಪುಸ್ತಕವು, ನೀವು ಪರೀಕ್ಷೆಗೆ ಆಯ್ಕೆ ಮಾಡಿಕೊಂಡಿರುವ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದ್ದೇ ಎಂಬುದನ್ನು ಪರಿಶೀಲಿಸಿರಿ.
3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಮೊಹರುನ್ನು ಜಾಗ್ರತೆಯಿಂದ ತೆರೆಯಿರಿ ಮತ್ತು ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯನ್ನು ಹೊರಗೆ ತೆಗೆದು, ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಸಾಮಾನ್ಯ ಮಾಹಿತಿಯನ್ನು ತುಂಬಿರಿ. ಕೊಟ್ಟಿರುವ ಸೂಚನೆಯಂತೆ ನೀವು ನಮೂನೆಯಲ್ಲಿನ ವಿವರಗಳನ್ನು ತುಂಬಲು ವಿಫಲರಾದರೆ, ನಿಮ್ಮ ಉತ್ತರ ಹಾಳೆಯ ಮೌಲ್ಯಮಾಪನ ಸಮಯದಲ್ಲಿ ಉಂಟಾಗುವ ಪರಿಣಾಮಗಳಿಗೆ ವೈಯಕ್ತಿಕವಾಗಿ ನೀವೇ ಜವಾಬ್ದಾರರಾಗಿರುತ್ತೀರಿ.
4. ಪರೀಕ್ಷೆಯ ಸಮಯದಲ್ಲಿ:
 - a) ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಯನ್ನು ಜಾಗ್ರತೆಯಿಂದ ಓದಿರಿ.
 - b) ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ನೀಡಿರುವ ನಾಲ್ಕು ಲಭ್ಯ ಆಯ್ಕೆಗಳಲ್ಲಿ ಅತ್ಯಂತ ಸರಿಯಾದ/ ಸೂಕ್ತವಾದ ಉತ್ತರವನ್ನು ನಿರ್ಧರಿಸಿ.
 - c) ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಸಂಬಂಧಿಸಿದ ಪ್ರಶ್ನೆಯ ವೃತ್ತಾಕಾರವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿರಿ. ಉದಾಹರಣೆಗೆ, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8ಕ್ಕೆ "C" ಸರಿಯಾದ ಉತ್ತರವಾಗಿದ್ದರೆ, ನೀಲಿ/ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಬಳಸಿ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯ ಕ್ರಮ ಸಂಖ್ಯೆ 8ರ ಮುಂದೆ ಈ ಕೆಳಗಿನಂತೆ ತುಂಬಿರಿ:
 ಪ್ರಶ್ನೆ ಸಂಖ್ಯೆ 8(A) (B) (C) (D) (ಉದಾಹರಣೆ ಮಾತ್ರ) (ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ ಮಾತ್ರ ಉಪಯೋಗಿಸಿ)
5. ಉತ್ತರದ ಪೂರ್ವಸಿದ್ಧತೆಯ ಬರವಣಿಗೆಯನ್ನು (ಚಿತ್ತು ಕೆಲಸ) ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒದಗಿಸಿದ ಖಾಲಿ ಜಾಗದಲ್ಲಿ ಮಾತ್ರವೇ ಮಾಡಬೇಕು (ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆಯಲ್ಲಿ ಮಾಡಬಾರದು).
6. ಒಂದು ನಿರ್ದಿಷ್ಟ ಪ್ರಶ್ನೆಗೆ ಒಂದಕ್ಕಿಂತ ಹೆಚ್ಚು ವೃತ್ತಾಕಾರವನ್ನು ಗುರುತಿಸಲಾಗಿದ್ದರೆ, ಅಂತಹ ಉತ್ತರವನ್ನು ತಪ್ಪು ಎಂದು ಪರಿಗಣಿಸಲಾಗುತ್ತದೆ ಮತ್ತು ಯಾವುದೇ ಅಂಕವನ್ನು ನೀಡಲಾಗುವುದಿಲ್ಲ. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿನ ಉದಾಹರಣೆ ನೋಡಿ.
7. ಅಭ್ಯರ್ಥಿ ಮತ್ತು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ನಿರ್ದಿಷ್ಟಪಡಿಸಿದ ಸ್ಥಳದಲ್ಲಿ ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯ ಮೇಲೆ ಸಹಿ ಮಾಡಬೇಕು.
8. ಅಭ್ಯರ್ಥಿಯು ಪರೀಕ್ಷೆಯ ನಂತರ ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಮೂಲ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಹಾಳೆ ಮತ್ತು ವಿಶ್ವವಿದ್ಯಾನಿಲಯದ ಪ್ರತಿಯನ್ನು ಹಿಂದಿರುಗಿಸಬೇಕು.
9. ಅಭ್ಯರ್ಥಿಯು ಪ್ರಶ್ನೆ ಪುಸ್ತಕವನ್ನು ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಅಭ್ಯರ್ಥಿಯ ಪ್ರತಿಯನ್ನು ತಮ್ಮ ಜೊತೆ ತೆಗೆದುಕೊಂಡು ಹೋಗಬಹುದು.
10. ಕ್ಯಾಲ್ಕುಲೇಟರ್, ಪೇಜರ್ ಮತ್ತು ಮೊಬೈಲ್ ಫೋನ್‌ಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೊಠಡಿಯ ಒಳಗೆ ಅನುಮತಿಸಲಾಗುವುದಿಲ್ಲ.
11. ಅಭ್ಯರ್ಥಿಯು ದುಷ್ಕೃತ್ಯದಲ್ಲಿ ತೊಡಗಿರುವುದು ಕಂಡುಬಂದರೆ, ಅಂತಹ ಅಭ್ಯರ್ಥಿಯನ್ನು ಕೋರ್ಸ್‌ಗೆ ಪರಿಗಣಿಸಲಾಗುವುದಿಲ್ಲ ಮತ್ತು ನಿಯಮಗಳ ಪ್ರಕಾರ ಇಂತಹ ಅಭ್ಯರ್ಥಿಯು ವಿರುದ್ಧ ಕ್ರಮ ಕೈಗೊಳ್ಳಲಾಗುವುದು.

ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯನ್ನು ತುಂಬಲು ಸೂಚನೆಗಳು

1. ಪ್ರತಿಯೊಂದು ಪ್ರಶ್ನೆಗೆ ಒಂದೇ ಒಂದು ಅತ್ಯಂತ ಸೂಕ್ತವಾದ/ಸರಿಯಾದ ಉತ್ತರವಿರುತ್ತದೆ.
2. ಪ್ರತಿ ಪ್ರಶ್ನೆಗೆ ಒಂದು ವೃತ್ತವನ್ನು ಮಾತ್ರ ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್ನಿನಿಂದ ಮಾತ್ರ ತುಂಬತಕ್ಕದ್ದು. ಉತ್ತರವನ್ನು ಮಾರ್ಪಡಿಸಲು ಪ್ರಯತ್ನಿಸಬೇಡಿ.
3. ವೃತ್ತದೊಳಗಿರುವ ಅಕ್ಷರವು ಕಾಣದಿರುವಂತೆ ವೃತ್ತವನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬುವುದು.
4. ಓ.ಎಂ.ಆರ್. ಹಾಳೆಯಲ್ಲಿ ಯಾವುದೇ ಅನಾವಶ್ಯಕ ಗುರುತುಗಳನ್ನು ಮಾಡಬೇಡಿ.

Note : English version of the instructions is printed on the front cover of this booklet.