

# UNIVERSITY OF MYSORE

Ph.D. Entrance Examination, Oct. - 2017



SUBJECT CODE :

26

QUESTION BOOKLET NO.

01855

Entrance Reg. No.

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## 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**

[50×1=50]

1. Greenhouse gases can absorb radiation of wavelength  
(A)  $< 0.3 \mu\text{m}$  (B)  $> 4 \mu\text{m}$   
(C)  $> 2.3 \mu\text{m}$  (D)  $< 4 \mu\text{m}$
2. "Chipko" movement was started by Sunder Lal Bahuguna in which area?  
(A) Narmada Valley (B) Rajasthan Desert  
(C) Western Ghat jungles (D) Garhwal Himalayas
3. Beer's Law is applicable in case of  
(A) Heat transfer (B) Transmission of light  
(C) Convection studies (D) Photochemical reaction
4. The boundary between troposphere and stratosphere is called  
(A) Ionosphere (B) Mesosphere  
(C) Thermosphere (D) None of the above
5. The major pollutant present in cigarette smoke is  
(A) CO and dioxin (B) Nicotine and CO  
(C) Benzene and CO (D) Dioxin and benzene
6. Anemometer is used to measure  
(A) Atmospheric temperature (B) Atmospheric pressure  
(C) Wind speed (D) Wind velocity
7. From air pollution point of view, example of an area source is  
(A) Traffic on highway  
(B) A large industrial unit having a single stack  
(C) A industry having 3 stacks  
(D) A industrial area having 50 small industry

8. The Central and State Boards for prevention and control of pollution were first constituted under which law?
- (A) The Environment (Protection) Act, 1986
  - (B) The Air (Prevention and control of pollution) Act, 1981
  - (C) The Water (Prevention and control of pollution) Act, 1974
  - (D) The Water (Prevention and control of pollution) Cess Act, 1978
9. A line where two plates meet each other is classified as \_\_\_\_\_.
- (A) plate tectonics
  - (B) plate boundary
  - (C) plate convection
  - (D) plate contraction
10. Phytoremediation is
- (A) Protection of plants from pests by integrates pest management
  - (B) Removal of toxicants from plant body by chemical means
  - (C) Use of plants for removing toxicants from soil, air and water
  - (D) Use of root Mycorrhizae for bioremediation purpose
11. The catalytic converter used in motor vehicles can't convert
- (A)  $\text{NO}_x$  to  $\text{N}_2$
  - (B) Hydrocarbons to  $\text{CO}_2$
  - (C)  $\text{CO}$  to  $\text{CO}_2$
  - (D)  $\text{SO}_2$  to Sulphur
12. Which of the following is a bioremediation technique?
- (A) Purging of air
  - (B) Composting
  - (C) Oxidation
  - (D) Reduction

13. Sodium tetrachloromercurate method mentioned in Indian Standards is used for estimating which air pollutant?
- (A) CO (B) SO<sub>2</sub>  
(C) NO<sub>2</sub> (D) NO<sub>x</sub>
14. Rotating Biological contactors are used for
- (A) Reducing BOD of waste water  
(B) Biofiltration of waste water  
(C) Removal color of textile effluent  
(D) Removing pathogens form sewage
15. In the Union Carbide Factory, Bhopal, the safety devices(s) installed to control accidental release of MIC was
- (A) Scrubber (B) Flare  
(C) Scrubber and flare (D) GAC absorption and flaring
16. Which device has a dust collection efficiency greater than 99%?
- (A) Wet-Electrostatic Precipitator (B) Venturi scrubber  
(C) Cyclonic spray scrubber (D) Multi cyclones
17. Minamata disease was due to
- (A) Phenyl mercury (B) Inorganic mercury  
(C) Methyl mercury (D) Benzenyl mercury
18. In human body which tissue is the best indicator of lead accumulation?
- (A) Fatty tissues (B) Bones  
(C) Brain (D) Blood

19. Mineral water bottles are made up of which compound
- (A) Polyvinyl chloride (B) High density polyethylene  
(C) Low density polyethylene (D) Polyethylene tetrathalate
20. In West-Gaeke method of  $\text{SO}_2$  estimation in ambient air, the scrubbing liquid contains
- (A)  $\text{HgCl}_2$  only  
(B) Formaldehyde and Para rosaniline  
(C)  $\text{HgCl}_2$  and Para rosaniline  
(D)  $\text{HgCl}_2$  and  $\text{KCl}$
21. Black lung disease is found in the people working in
- (A) Electroplating industry (B) Paint industry  
(C) Organic solvent industry (D) Coal mines
22. Most abundant fossil fuel is
- (A) Coal (B) Oil  
(C) Natural gas (D) Peat
23. Among the following the strongest rock is
- (A) Granite (B) Basalt  
(C) Sand stone (D) Lime stone
24. The optimum fluoride concentration in drinking water is
- (A) 0.1 ppm (B) 0.5 ppm  
(C) 1.0 ppm (D) 1.5 ppm
25. Richter scale measures
- (A) Wind intensity (B) Oceanic depth  
(C) Intensity of tides (D) Earthquake intensity

26. The standard of DO in drinking water is
- (A) 2-4 mg/l (B) 4-6 mg/l  
(C) 6-8 mg/l (D) 8-10 mg/l
27. The Term "Ecosystem" was first given by a British ecologist in 1935. He was
- (A) E. Odum (B) A. G. Transley  
(C) E. Haeckel (D) J. B. S. Haldane
28. Food chains can be divided into how many basic types?
- (A) 2 (B) 6  
(C) 3 (D) 4
29. Synecology means study of the ecology of
- (A) One species (B) Pathogenic organism  
(C) A community (D) Symbiotic species
30. The first step in the Environmental Impact Assessment (EIA) process is
- (A) Identification of key impacts  
(B) Description of environmental baseline  
(C) Project screening  
(D) Description of the project/development action
31. Notification on Environmental Impact Assessment of Development Projects is covered under
- (A) Environmental Impact Assessment Act, 1994  
(B) Environment Protection Act, 1986  
(C) The Factories Act, 1948  
(D) The Environmental Conservation Act, 1994

32. Among the following which project will require clearance from central Government?
- (A) Food processing industries                      (B) Plastic molding unit  
(C) Garment industry                                      (D) Synthetic rubber industry
33. Public participation is ideally most important at which stage of EIA process?
- (A) Proposing mitigation measure  
(B) Post monitoring of the project  
(C) In evaluating the relative significance of the likely impacts  
(D) In determining the scope of EIA
34. Renewable resource of energy includes
- (A) Solar energy    (B) Natural gas  
(C) Coal gas    (D) Fossil fuels
35. Solar power concept for producing electricity was developed by
- (A) Charles Abbott in 1930                              (B) Charles Robert in 1925  
(C) L. D. Myer    (D) W. H. Wischmeier
36. Environmental audit is also known as
- (A) Environmental Surveillance                      (B) Environmental review  
(C) Environmental assurance                      (D) All
37. A normal conversation is done at sound level
- (A) 80 dB    (B) 60 dB  
(C) 100 dB    (D) 40 dB

38. The performance of a sound insulating material is expressed in term of  
(A) Noise level index (B) Vibration index  
(C) Sound reduction index (D) Sound coefficient
39. Thermal power plants mainly produce  
(A) Fly ash (B) CO  
(C) NO<sub>x</sub> (D) CaSO<sub>4</sub>
40. Photosensitive detectors is used in  
(A) Lux meter (B) Dissolved oxygen meter  
(C) Electronic temperature meter (D) All
41. Which type of forest cover maximum area in our country?  
(A) Tropical rain forest (B) Tropical moist deciduous forest  
(C) Tropical dry deciduous forest (D) Tropical dry ever green forest
42. Which state has recently registered an increasing green cover?  
(A) Madhya Pradesh (B) Maharashtra  
(C) Uttar Pradesh (D) Delhi
43. The centre for environmental education is presently situated at  
(A) Mumbai (B) Delhi  
(C) Bangalore (D) Ahmedabad
44. Which zone of a pond doesn't received light?  
(A) Littoral zone (B) Limnetic zone  
(C) Profundal zone (D) Nektone zone



45. Biological magnification refers to
- (A) The increase in the biotic population of an area
  - (B) The increase in the size the individuals of a species due to natural evolution
  - (C) The process were by harmful chemicals enter and gets concentrated in a food chain
  - (D) Viewing of a living cell through an electron microscope
46. In limnology, "Lotic" stands for those water bodies
- (A) Which are seasonal in nature
  - (B) Where water is flowing
  - (C) Which are short of the nutrients
  - (D) Which are having excess nutrients
47. The most commonly used method for desalination of water is
- (A) Distillation
  - (B) Reverse osmosis
  - (C) Electro dialysis
  - (D) Ion-Exchange
48. Jar test is used to determine
- (A) Turbidity of water
  - (B) Settling of colloids
  - (C) Coagulant dose
  - (D) Coagulant time
49. Nalgonda method was developed by Indian scientist to remove which chemical species from water
- (A) Iron
  - (B) Manganese
  - (C) Chromium
  - (D) Fluoride
50. Hardness is commonly measured in terms of
- (A)  $\text{CaCO}_3$  equivalents
  - (B)  $\text{CaSO}_4$  equivalents
  - (C)  $\text{MgCO}_3$  equivalents
  - (D)  $\text{MgSO}_4$  equivalents

## PART-B

This part shall contain five (5) questions, each carrying ten (10) Marks.  
The candidate has to answer all questions. [5×10=50]

1. What are Greenhouse gases and Greenhouse effect? Discuss the potential and contribution of these gases to Global Warming phenomenon.
2. Briefly discuss droughts and floods with respect of their occurrence and impacts.
3. What are essential of Gas Liquid Chromatography and discuss various types of detector used there in?
4. What is ecosystem? With the help of the suitable models explain the energy flow in the ecosystem.
5. Give a diagrammatic representation of the cross-sectional view of ideal sanitary landfills.



## Rough Work

**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 ಮೊಹರು 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 ಜವಾಬ್ದಾರಾಗಿರುತ್ತೀರಿ.
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 ಸರಿಗಣಿಸಲಾಗುವುದಿಲ್ಲ ಮತ್ತು ನಿಯಮಗಳ ಪ್ರಕಾರ ಇಂತಹ ಅಭ್ಯರ್ಥಿಯ 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.

**SEAL**