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FOR KSET PREPARATION

KSET 2023 Environmental Sciences Question Paper

EXAM	YEAR	TYPE
KSET	2023	Question Paper

ಕ್ರಮ ಸಂಖ್ಯೆ

423989

K-SET

ಸ್ಪರ್ಧಾತ್ಮಕ ಪರೀಕ್ಷೆ- 2023

ಪತ್ರಿಕೆ – II

ವರ್ಷನ್ ಸಂಕೇತ

A1

ವಿಷಯ: ಪರಿಸರ ವಿಜ್ಞಾನಗಳು

ವಿಷಯ ಸಂಕೇತ:29

ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ ಸಂಕೇತ	ಅವಧಿ	ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ	ಗರಿಷ್ಠ ಅಂಕಗಳು	ನಿಮ್ಮ ನೋಂದಣಿ ಸಂಖ್ಯೆಯನ್ನು ನಮೂದಿಸಿ						
ENV202329	ಎರಡು ಘಂಟೆಗಳು	100	200							

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಸೂಚನೆಗಳು

ಮಾಡಿ:

1. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯನ್ನು ನಿಮಗೆ ಎರಡನೇ ಬೆಲ್ ಆದ ನಂತರ ಕೊಡುತ್ತಾರೆ.
2. ನೊಂದಣಿ ಸಂಖ್ಯೆಯನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಬರೆದು ಅದಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ವೃತ್ತಗಳನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಿದ್ದೀರೆಂದು ಖಾತ್ರಿಪಡಿಸಿಕೊಳ್ಳತಕ್ಕದ್ದು.
3. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಅನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಬರೆದು ಅದಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ವೃತ್ತಗಳನ್ನು ಸಂಪೂರ್ಣವಾಗಿ ತುಂಬಬೇಕು.
4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ವರ್ಷನ್ ಕೋಡ್ ಮತ್ತು ಕ್ರಮ ಸಂಖ್ಯೆಯನ್ನು ನಾಮಿನಲ್ ರೋಲ್‌ನಲ್ಲಿ ತಪ್ಪಿಲ್ಲದೆ ಬರೆಯಬೇಕು.
5. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯ ಕೆಳಭಾಗದ ನಿಗದಿತ ಜಾಗದಲ್ಲಿ ಕಡ್ಡಾಯವಾಗಿ ಸಹಿ ಮಾಡಬೇಕು.

ಮಾಡಬೇಡಿ:

1. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಮುದ್ರಿತವಾಗಿರುವ **ಟೈಮಿಂಗ್ & ಮಾರ್ಕ್**ನ್ನು ತಿದ್ದಬಾರದು / ಹಾಳುಮಾಡಬಾರದು / ಅಳಿಸಬಾರದು.
2. ಮೂರನೇ ಬೆಲ್ ಆಗುವವರೆಗೂ,
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ಅನ್ನು ತೆಗೆಯಬಾರದು.
   - ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಒಳಗಡೆ ಇರುವ ಪ್ರಶ್ನೆಗಳನ್ನು ನೋಡಲು ಪ್ರಯತ್ನಿಸಬಾರದು ಮತ್ತು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸಬಾರದು.

ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಮುಖ್ಯ ಸೂಚನೆಗಳು

1. ಪ್ರಶ್ನೆಗಳಲ್ಲಿ ಬಳಸಿರುವ signs and symbols ಗಳನ್ನು, ಬೇರೆ ರೀತಿಯಲ್ಲಿ ಹೇಳದ ಹೊರತು, ನಿಗದಿತ ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿನ ಅರ್ಥವನ್ನು ಪರಿಗಣಿಸಬೇಕು.
2. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಒಟ್ಟು **100** ಪ್ರಶ್ನೆಗಳಿದ್ದು, ಪ್ರತಿ ಪ್ರಶ್ನೆಗೂ 4 ಬಹು ಆಯ್ಕೆ ಉತ್ತರಗಳು ಇರುತ್ತವೆ. ಪ್ರತಿ ಪ್ರಶ್ನೆಯ ಕೆಳಗೆ ಕೊಟ್ಟಿರುವ ನಾಲ್ಕು ಬಹು ಆಯ್ಕೆಯ ಉತ್ತರಗಳಲ್ಲಿ ಸರಿಯಾದ ಒಂದು ಉತ್ತರವನ್ನು ಆಯ್ಕೆ ಮಾಡಿ.
3. ಮೂರನೇ ಬೆಲ್ ಆದ ನಂತರ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯ ಬಲಭಾಗದಲ್ಲಿರುವ ಸೀಲ್ ತೆಗೆದು ಈ ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಯಾವುದೇ ಪುಟಗಳು ಮುದ್ರಿತವಾಗಿಲ್ಲದೇ ಇರುವುದು ಕಂಡು ಬಂದಲ್ಲಿ ಅಥವಾ ಹರಿದು ಹೋಗಿದ್ದಲ್ಲಿ ಅಥವಾ ಯಾವುದೇ ಅಕ್ಷರಗಳು ಬಿಟ್ಟುಹೋಗಿದ್ದಲ್ಲಿ ಎಂಬುದನ್ನು ಖಚಿತಪಡಿಸಿಕೊಂಡು, ಈ ರೀತಿ ಆಗಿದ್ದರೆ ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ಬದಲಾಯಿಸಿ ಕೊಳ್ಳುವುದು. ನಂತರ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸಲು ಪ್ರಾರಂಭಿಸುವುದು.
4. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿನ ಪ್ರಶ್ನೆಗೆ ಅನುಗುಣವಾಗಿರುವ ಸರಿ ಉತ್ತರವನ್ನು ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಅದೇ ಕ್ರಮ ಸಂಖ್ಯೆಯ ಮುಂದೆ ನೀಡಿರುವ ಸಂಬಂಧಿಸಿದ ವೃತ್ತವನ್ನು ನೀಲಿ ಅಥವಾ ಕಪ್ಪು ಬಾಲ್ ಪಾಯಿಂಟ್ ಪೆನ್‌ನಿಂದ ಸಂಪೂರ್ಣ ತುಂಬುವುದು.

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHODS
(A) ● (C) (D)	✗ (B) (C) (D) (A) (B) (C) ✓ (A) ● ● (D)
	● (B) (C) (D) (A) ● (C) (D)

5. ಈ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಸ್ಕ್ಯಾನ್ ಮಾಡುವ ಸ್ಕ್ಯಾನರ್ ಬಹಳ ಸೂಕ್ಷ್ಮವಾಗಿದ್ದು ಸಣ್ಣ ಗುರುತನ್ನು ಸಹ ದಾಖಲಿಸುತ್ತದೆ. ಆದ್ದರಿಂದ ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯಲ್ಲಿ ಉತ್ತರಿಸುವಾಗ ಎಚ್ಚರಿಕೆ ವಹಿಸಿ.
6. ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆಯಲ್ಲಿ ಕೊಟ್ಟಿರುವ ಖಾಲಿ ಜಾಗವನ್ನು ರಫ್ ಕೆಲಸಕ್ಕೆ ಉಪಯೋಗಿಸಿ. ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಇದಕ್ಕೆ ಉಪಯೋಗಿಸಬೇಡಿ.
7. **ಕೊನೆಯ ಬೆಲ್ ಆದ ನಂತರ ಉತ್ತರಿಸುವುದನ್ನು ನಿಲ್ಲಿಸಿ, ಓ.ಎಂ.ಆರ್. ಉತ್ತರ ಪತ್ರಿಕೆಯನ್ನು ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರಿಗೆ ಯಥಾಸ್ಥಿತಿಯಲ್ಲಿ ನೀಡಿರಿ.**
8. ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರು ಮೇಲ್ಭಾಗದ ಹಾಳೆಯನ್ನು ಪ್ರತ್ಯೇಕಿಸಿ (ಕಚೇರಿ ಪ್ರತಿ) ತಮ್ಮ ವಶದಲ್ಲಿ ಇಟ್ಟುಕೊಂಡು ತಳಬದಿಯ ಯಥಾಪ್ರತಿಯನ್ನು (ಅಭ್ಯರ್ಥಿಯ ಪ್ರತಿ) ಅಭ್ಯರ್ಥಿಗಳಿಗೆ ಕೊಡುತ್ತಾರೆ.
9. ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಸಮಾನ ಅಂಕಗಳಿರುತ್ತದೆ. ಋಣಾತ್ಮಕ ಮೌಲ್ಯಮಾಪನವಿರುವುದಿಲ್ಲ.
10. ಯಾವುದೇ ರೀತಿಯ ಮೊಬೈಲ್ ಫೋನ್, ಕ್ಯಾಲ್ಕ್ಯುಲೇಟರ್ ಮತ್ತು ಇತರೆ ರೀತಿಯ ಎಲೆಕ್ಟ್ರಾನಿಕ್/ಕಮ್ಯುನಿಕೇಷನ್ ಸಾಧನಗಳು ಇತ್ಯಾದಿಗಳನ್ನು ಪರೀಕ್ಷಾ ಕೇಂದ್ರದ ಅವರಣದೊಳಗೆ ತರುವುದನ್ನು ನಿಷೇಧಿಸಿದೆ.

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1. Which of the following is the correct sequence of layers as we move upwards from Earth's surface ?

(A) Thermosphere → Mesosphere → Stratosphere → Troposphere

(B) Stratosphere → Troposphere → Mesosphere → Thermosphere

(C) Thermosphere → Stratosphere → Mesosphere → Troposphere

(D) Troposphere → Stratosphere → Mesosphere → Thermosphere

2. Which of the following atmospheric layer contains its constituents in ionized state ?

(A) Mesosphere (B) Troposphere

(C) Thermosphere (D) Hydrosphere

3. Ecosystem follows which of the thermodynamic laws ?

(A) First (B) Second

(C) Third (D) First and Second

4. At what temperature does water have maximum density ?

(A) 0°C (B) 4°C (C) 28°C (D) 100°C

5. Which of the following are required to achieve sustainable development ?

(A) A balance between economic growth and social equity

(B) A balance between economic growth, social equity and environmental stability

(C) A strong economic growth

(D) A balance between society and environment

6. Which of the following is used to examine the distribution of air temperatures over large areas ?

(A) Exotherm (B) GPS

(C) Mesotherm (D) Isotherm

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7. The two most common forms of precipitation are

(A) Rain and sleet
(B) Rain and snow
(C) Rain and hail
(D) Snow and rime

8. Rate of temperature change occurs slowly in

(A) Dry adiabatic rate of cooling
(B) Wet adiabatic rate of cooling
(C) Both dry and wet adiabatic rate of cooling
(D) Only dry adiabatic cooling and not in wet adiabatic cooling

9. The remote sensing system mostly operates in the _____ portions of the EMR spectrum.

(A) UV, IR, Microwave
(B) UV, IR, Radiowave
(C) Visible, IR, Microwave
(D) UV, Visible, IR

10. Which of the following elements of image interpretation in remote sensing refers to the spatial arrangement of objects ?

(A) Tone (B) Pattern (C) Size (D) Shape

11. The SI unit of chemical potential can be represented as :

(A) Mole
(B) Joule
(C) Joule/Mole
(D) Kg/Mole

12. A first order reaction takes 8 hours for 90% completion. Calculate the time required for 80% completion. Given that log 5 = 0·6989, log 10 = 1.

(A) 6·98 hours (B) 5·59 hours (C) 4·20 hours (D) 3·62 hours

13. The pH of 10^{-8} M HNO_3 at normal condition will be :

(A) 8 (B) Below 7 (C) Above 7 (D) 10

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14. Among the following, primary contributor of greenhouse gas is :

(A) Carbon dioxide
(B) Benzene
(C) Ethane
(D) None of the above

15. The pleasant aroma of pine, eucalyptus and sandalwood trees is caused by a volatile organic compound called :

(A) Benzyl chloride
(B) Terpenes
(C) Gasoline
(D) Carotenoids

16. Which of the following is/are correct regarding ozone ?

I. Ozone is present in the stratosphere.
II. Ozone helps UV radiation to penetrate and reach to the living organisms on earth.
III. It is formed by the photochemical reactions in the atmosphere.

(A) Only I
(B) Both I and III
(C) Both I and II
(D) Both II and III

17. Match List-I and List-II and select the most suitable answer from the codes given below :

	List-I		*List-II*
a.	SEM	i.	Elements Identification
b.	IR spectroscopy	ii.	Beer-Lambert law
c.	Nephelometry	iii.	Surface morphology
d.	UV-visible spectroscopy	iv.	Functional group of molecules
e.	XRF	v.	Turbidity

Codes :

	a	**b**	**c**	**d**	**e**
(A)	iii	iv	v	i	ii
(B)	iii	iv	i	v	ii
(C)	iv	iii	v	ii	i
(D)	iii	iv	v	ii	i

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18. Thin layer chromatography comes under which category ?

(A) Adsorption chromatography

(B) Partition chromatography

(C) Electrical mobility of ionic species

(D) None of the above

19. Among the following elements, the flame photometer cannot detect :

(A) Sodium (B) Calcium (C) Potassium (D) Lead

20. Given below are statements regarding the solubility of gases in water. Select the true statement :

(A) Liquified gases are most difficult to dissolve in water

(B) Solute can dissolve more in saturated solution

(C) Increase of temperature after a certain level inhibits dissolving reactions

(D) Solubility of gases does not depend on temperature

21. Sometimes, speciation can be quite abrupt after a long period of stability. This is called

(A) Founder effect (B) Punctuated equilibrium

(C) Macroevolution (D) Crossing-over

22. The carrying capacity of population is determined by :

(A) Natality (B) Population growth

(C) Limiting resources (D) Mortality

23. Maximum density of detritivore micro-organisms in pond ecosystem is present in :

(A) Photic zone (B) Littoral zone

(C) Benthic zone (D) Limnetic zone

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24. Match List-I and List-II and select the most suitable answer from the codes given below :

	List-I (Ecosystem type)		*List-II (Characteristic)*
a.	Coral reefs	i.	Still water
b.	Deltas	ii.	Saline water
c.	Wetlands	iii.	Brackish water
d.	Rivers	iv.	Fresh water

Codes :

	a	**b**	**c**	**d**
(A)	i	ii	iii	iv
(B)	ii	i	iv	iii
(C)	ii	iii	i	iv
(D)	iii	iv	i	ii

25. Which of the following two regions from India are biodiversity hotspots ?

(A) Western Himalayas and Eastern Ghats

(B) Eastern Himalayas and Western Ghats

(C) Southern Himalayas and Western Ghats

(D) Northern Himalayas and Western Ghats

26. The largest unit of climax communities representing well-defined climatic zone is referred to as :

(A) Biota

(B) Biome

(C) Biosphere

(D) Landscape

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27. The rate of replacement of species along a gradient of habitats pertains to :

(A) Species diversity

(B) Beta diversity

(C) Alpha diversity

(D) Gamma diversity

28. The cause of lung mesothelioma is :

(A) Asbestos

(B) Arsenic

(C) Chromium

(D) Mercury

29. Which one of the following superbug bacterium is responsible for cleaning up oil spills ?

(A) *Thiobacillus denitrificans*

(B) *Pseudomonas denitrificans*

(C) *Pseudomonas putida*

(D) *Bacillus subtilis*

30. Polychlorinated biphenyls (PCBs) which cause environmental exposure risk have which of these important properties ?

(A) Very high volatility in air

(B) Chemically unstable and highly reactive

(C) Heat stable and have no flash or fire point

(D) Highly soluble in water and poorly soluble in oils and organic solvents

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31. The igneous rock which does not sink in water is :

(A) Basalt (B) Granite (C) Gneissoid (D) Pumice

32. Which of the following statements are correct with reference to steady state ?

I. Used to define consecutive reaction changes

II. No net transfer of heat occurs

III. Closed system

IV. Kinetically controlled processes

(A) I, II and III (B) II, III and IV

(C) III and IV (D) I and IV

33. The impact of Western disturbances are :

I. Cloudiness, more precipitation

II. Deliver much needed rainfall to parched areas and recharge water supplies

III. Increase atmospheric temperature which affect elderly and those with health issues

IV. Provide relief from the country's dry and scorching temperature

(A) I, III and IV (B) I, II and IV

(C) I, II and III (D) II, III and IV

34. Which of the below is a 1:1 clay mineral ?

(A) Kaolinite (B) Talc

(C) Pyrophyllite (D) Vermiculite

35. According to Hans Jenny, the type of soil found on any site is dependent upon the interaction of various parameters including

I. Climate II. Organisms

III. Topography IV. Parent material

(A) I, II and III (B) I, III and IV

(C) II, III and IV (D) I, II, III and IV

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36. AWIPS stands for :

(A) Advanced Weather Interactive Processing System

(B) Automated Weather Information Processing System

(C) Advanced Weather International Processing System

(D) Air Water Information Processing System

37. _____ is measured by analyzing the ratio between the dynamic viscosity and the density of a fluid.

(A) Kinetic viscosity (B) Dynamic viscosity

(C) Kinematic viscosity (D) Fluid viscosity

38. According to WHO, how much E.coli is acceptable in drinking water ?

(A) 1 CFU/100 mL (B) 100 CFU/100 mL

(C) 0 CFU/100 mL (D) 10 CFU/100 mL

39. Which of the following is a sudden motion or trembling of the Earth as stored elastic energy is released by fracture and movement of rocks along a fault ?

(A) Ground shaking (B) Surface fault rupture

(C) Liquefaction (D) Seiches

40. The merits of *in situ* leach mining process are :

I. No generation of tailings or waste rock

II. Lower consumption of water

III. The fluids remaining after leaching contain high amount of metals

IV. Acidification of surrounding environment

(A) I and III (B) II and III

(C) I and II (D) III and IV

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41. Which element is commonly used for commercial photovoltaic solar cell manufacturing ?

(A) Germanium (B) Tungsten (C) Silicon (D) Carbon

42. From among the following statements, select the suitable one for gross calorific value :

(A) The quantity of heat liberated by the combustion of a unit volume of gas

(B) Practical amount of energy released at atmospheric pressure

(C) It is the calorific value minus the latent heat in the water produced by the combustion of hydrogen

(D) All of the above

43. Among the Greenhouse Gases (GHGs), the ability to trap heat energy for methane (CH_4) is how many times higher than that of carbon dioxide (CO_2) ?

(A) 10 times (B) 5 times (C) 21 times (D) 31 times

44. Match List-I and List-II and select the most suitable answer from the codes given below :

	List-I (Source of Energy)		*List-II (Type of process)*
a.	Geothermal	i.	Utilizes energy from Sun
b.	Wind	ii.	Utilizes energy from the natural rise and fall of tides
c.	Tidal	iii.	Utilizes kinetic energy produced by the wind
d.	Solar	iv.	Utilizes heat produced deep under the Earth's crust

Codes :

	a	**b**	**c**	**d**
(A)	iv	iii	ii	i
(B)	iv	iii	i	ii
(C)	iv	i	iii	ii
(D)	iii	iv	ii	i

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45. Biodiesel in India is mainly produced from which of the following plants ?

(A) Jatropha sp
(B) Calotropis sp
(C) Glycine sp
(D) Canola sp

46. World Energy Day is celebrated on

(A) October 22
(B) October 20
(C) October 21
(D) October 23

47. The half-life of Radon $\left(^{224}_{86}\text{Rn}\right)$ is 3·8 days. If your basement contains 45 g of $^{224}_{86}\text{Rn}$ today, how much $^{224}_{86}\text{Rn}$ will remain after 8·5 days ? [Assume that only radioactive decay is occurring].

(A) 8 g
(B) 9 g
(C) 10 g
(D) 12 g

48. Which of the following has the greatest penetrating ability ?

(A) α-particles
(B) γ-rays
(C) β-particles
(D) None of the above

49. The best method for measurement of moisture content for high rank coal is :

(A) Heating the coal with toluene and relative loss of mass determination
(B) Drying in minimum free space oven at 150°C in N_2 and relative loss of mass determination
(C) Drying in air at 100 – 150°C and relative loss of mass determination
(D) Both (A) and (B)

50. The technique of ocean thermal energy conversion is based on :

(A) Producing energy by using potential of tides
(B) Producing energy by utilizing the heat energy from underwater volcanoes
(C) Producing energy by harnessing the temperature differences between the coastal water and deep ocean water
(D) Producing energy by harnessing the temperature difference between ocean surface water and deep ocean water

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51. According to National Ambient Air Quality Standards (NAAQS), the acceptable limit for carbon monoxide in air for 8 hr average is :

(A) 100 $\mu g/m^3$

(B) 240 $\mu g/m^3$

(C) 160 $\mu g/m^3$

(D) 10 $\mu g/m^3$

52. Which of the following reactions in the presence of sunlight is responsible for photochemical smog formation ?

(A) Hydrocarbons + $SO_x \rightarrow$ Smog

(B) Hydrocarbons + $NO_x \rightarrow$ Smog

(C) Hydrocarbons + $CO_x \rightarrow$ Smog

(D) Hydrocarbons + $O_3 \rightarrow$ Smog

53. In conventional water treatment systems, which among the following processes are used for disinfection ?

(A) Ozonation

(B) Membrane filtration

(C) Chlorination

(D) Activated carbon adsorption

54. An aeration tank has an MLSS concentration of 2000 mg/L. After settling for 30 minutes in a 1 L graduated cylinder, the sludge volume is measured to be 150 mg/L. Calculate the SVI (Sludge Volume Index) of the sludge.

(A) 50 mL/L

(B) 75 mL/L

(C) 100 mL/L

(D) 125 mL/L

55. Sound wave in air at 21°C travels at a speed of 344 m/s. How long would it take to hear thunder from a bolt of lightning that occurred 5 km away from an observer ?

(A) 60 seconds

(B) 1 second

(C) 15 seconds

(D) 5 seconds

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56. Loudness and pitch of sound are important aspects of noise.

Loudness and pitch are related to :

(A) Frequency and amplitude
(B) Wavelength and frequency
(C) Frequency and wavelength
(D) Amplitude and frequency

57. The uppermost layer of soil is called A-horizon. It consists of

(A) Partially decomposed organic matter
(B) More inorganic mineral matter
(C) Fewer organisms
(D) Weathered parent material

58. Laterites are composed of a mixture of hydrated oxides of aluminum and iron with small amounts of manganese oxide. It is arranged in the following order :

(A) Alfisol, Inceptisol and Ultisol
(B) Alfisol, Ultisol and Oxisol
(C) Vertisol, Inceptisol and Entisol
(D) Entisol and Aridisol

59. The discharge of warm water into a river leads to thermal pollution, which

(A) causes decrease in the solubility of oxygen
(B) causes increase in the solubility of oxygen
(C) causes decrease in the metabolic activity of fish
(D) maintains the ecological balance

60. According to NRC occupational dose limit of radiation workers, the annual Total Effective Dose Equivalent (TEDE) for the whole body is :

(A) 2000 mrem (B) 5 rem (C) 2 rem (D) 8 rem

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61. The temperature at which ash forms a solid form or clinker :

(A) 500 – 600°C
(B) 600 – 700°C
(C) 800 – 900°C
(D) 1100 – 1200°C

62. The containers which are used for the storage of waste and remain at the point of collection are called :

(A) Hauled container system
(B) Stationary container system
(C) Iron container system
(D) Plastic container system

63. Biofuels made from compressed organic matter or biomass :

(A) Bio-oil
(B) Fuel pellets
(C) Charcoal
(D) Liquid fuel

64. In a typical municipal solid waste, least percentage of ash is present in :

(A) Textiles
(B) Plastics
(C) Rubber
(D) Leather

65. Plastics, polythenes, glasses, vegetables, fruits, etc. are the main components of which type of waste ?

(A) Agricultural solid waste
(B) Institutional waste
(C) Domestic waste
(D) Commercial waste

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66. Match List-I and List-II and select the most suitable answer from the codes given below :

	List-I (Types of Wastes)		*List-II (Treatment and Disposal)*
a.	Human tissues	i.	Disinfection and shredding / mutilation
b.	Wastes from laboratory culture	ii.	Disinfection / discharge into drains
c.	Waste sharps	iii.	Autoclaving / microwaving incineration
d.	Liquid waste	iv.	Incineration / deep burial

Codes :

	a	**b**	**c**	**d**
(A)	iv	iii	i	ii
(B)	ii	iii	iv	i
(C)	iii	iv	ii	i
(D)	iv	iii	ii	i

67. The hazardous waste exhibits the following characteristics :

(A) Reactivity, solubility, toxicity, perceptibility

(B) Reactivity, toxicity, ignitability, corrosivity

(C) Toxicity, reactivity, solubility, perceptibility

(D) Corrosivity, reactivity, ignitability, perceptibility

68. The end products of neutralization are :

(A) Acid and gas

(B) Alkaline and water

(C) Water and salt

(D) Ash and acid

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69. The thermal disintegration of carbonaceous material in aerobic conditions is :

(A) Incarceration

(B) Pyrolysis

(C) Burning

(D) Dry heating

70. Given below are two statements – one labelled as Assertion (A) and the other labelled as Reason (R). Find the correct statement by using the codes given below :

Assertion (A) : When quantitative probabilistic risk assessment is performed on hazardous waste sites they usually turn out to be of relatively low threats.

Reason (R) : In hazardous waste sites the chance of exposure is low because of isolation of drinking water supplies and prevention of access.

(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

71. An Environmental Statement should examine the potential impacts of development and present them from :

(A) The regulator's perspective

(B) The developer's view

(C) An unbiased view, minimizing subjectivity

(D) The environmental consultants' view

72. Where a preliminary EIA is carried out during screening, which of the following should ***not*** be included ?

(A) A description of the proposal

(B) Review of the degree of public concern and interest about the proposal

(C) A plan for mitigation measures

(D) Review of the potential impacts of the proposal and their likely significance

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73. During the year 1991, Government of India had introduced the scheme called 'Ecomark'. What is the Ecomark symbol ?

(A) Tree (B) Star

(C) Flower with crown (D) Earthen pot

74. EIA notifications 1994 and 2006 were drafted and implemented based on the Environment (Protection) Act, 1986 under which rule ?

(A) Rule 3 (B) Rule 5 (C) Rule 10 (D) Rule 1

75. Which type of data is commonly used in hazard identification ?

(A) Risk assessment

(B) Exposure levels

(C) Toxicological and epidemiological data

(D) Risk management plans

76. What is the primary goal of risk characterization ?

(A) To assess risk factors

(B) To integrate hazard and exposure information

(C) To identify hazards

(D) To estimate exposure levels

77. Which government body is responsible for enforcing the provisions of the Water (Prevention and Control of Pollution) Act, 1974 ?

(A) Central Water Commission

(B) Ministry of Health and Family Welfare

(C) National Disaster Management Authority

(D) Central Pollution Control Board

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78. What is the main objective of the Plastic Waste Management Rules, 2016 ?

(A) Regulate the manufacture and use of plastic carry bags

(B) Ban the use of plastics in all industries

(C) Encourage the use of single-use plastic products

(D) Promote the export of plastic waste to other countries

79. The Biomedical Waste Management Rules, 2016 classifies biomedical waste into how many categories ?

(A) 2 (B) 3 (C) 4 (D) 5

80. Chilika Lake was declared as the first Ramsar site in India during 1981. Where is it located ?

(A) Tamil Nadu

(B) Karnataka

(C) Rajasthan

(D) Odisha

81. Bernoulli Trials are also known as

(A) Binomial distribution

(B) Normal distribution

(C) Probability distribution

(D) Frequency distribution

82. _____ is not a type of matrix.

(A) Zero matrix

(B) Row matrix

(C) Unit matrix

(D) Model matrix

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83. Which of the following is equal to ${}^5C_2$?

(A) 10

(B) 30

(C) 5

(D) 0

84. The data obtained from medical records is/are :

I. Quantitative data

II. Primary data

III. Qualitative data

IV. Secondary data

(A) I and IV (B) II and III

(C) III and IV (D) I and II

85. Which of the following is ***not*** one of the 6 Vs of Big Data analytics ?

(A) Variability

(B) Velocity

(C) Volume

(D) Vicinity

86. Goodness of fit of a distribution can be tested by

(A) F-test

(B) T-test

(C) Chi-square test

(D) Z-test

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87. β_2 measures

(A) Moment
(B) Kurtosis
(C) Symmetry
(D) Harmonic mean

88. Which one is ***not*** supervised learning ?

(A) PCA
(B) Decision Tree
(C) Linear Regression
(D) Naive Bayesian

89. _____ is used to compare values over categories.

(A) Line chart
(B) Dot graph
(C) Pie chart
(D) Column chart

90. The value of y will be _____ when $z = y + y^2 + y^3 + \ldots\ldots + \infty$ and y is positive and less than one.

(A) $\frac{1-z}{z}$
(B) $\frac{1+z}{z}$
(C) $\frac{z}{1+z}$
(D) $\frac{z}{1-z}$

91. Which of the following is a major cause of biodiversity loss ?

(A) Climate stability
(B) Habitat destruction
(C) Introduction of genetic diversity
(D) Limited habitat expansion

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92. _____ aims to limit global warming by reducing greenhouse gas emissions.

(A) Kyoto Protocol

(B) Montreal Protocol

(C) Paris Agreement

(D) Nagoya Protocol

93. Which of the following chemicals used in cooling systems cause ozone depletion ?

(A) CH_4

(B) NO_x

(C) VOC_s

(D) CFC_s

94. _____ is responsible for regulating the international trade in endangered species.

(A) IUCN

(B) CITES

(C) EPA

(D) CBD

95. The primary objective of the National Mission for a Green India is :

(A) Conservation of biodiversity and restoration of degraded ecosystems

(B) Promotion of green energy

(C) Promotion of green buildings

(D) Improving of urban infrastructures

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96. Match List-I and List-II and select the most suitable answer from the codes given below :

	List-I (Dams)		*List-II (States / Rivers)*
a.	Narmada Dam	i.	Jammu and Kashmir
b.	Tehri Dam	ii.	Gujarat
c.	Almatti Dam	iii.	Bhagirathi River
d.	Ratle Power Project	iv.	Krishna River

Codes :

	a	**b**	**c**	**d**
(A)	iv	ii	i	iii
(B)	ii	iv	iii	i
(C)	ii	iii	iv	i
(D)	i	ii	iii	iv

97. In which year was the National Solar Mission launched in India ?

(A) 2008

(B) 2009

(C) 2010

(D) 2014

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98. Match List-I and List-II and select the most suitable answer from the codes given below :

	List-I (Movements)		*List-II (Objectives)*
a.	Chipko Movement	i.	Protect tropical rainforest ecosystem
b.	Appiko Movement	ii.	Protect the forests and resources in Odisha
c.	Silent Valley Movement	iii.	Hugging trees to prevent felling
d.	Gandhamardan Movement	iv.	Conserve the trees of Kalse forest

Codes :

	a	**b**	**c**	**d**
(A)	ii	i	iv	iii
(B)	iii	i	iv	ii
(C)	i	iii	iv	ii
(D)	iii	iv	i	ii

99. Project Tiger was started in India for conservation of

(A) Bengal Tiger

(B) Sumatran Tiger

(C) Malayan Tiger

(D) Indo-Chinese Tiger

100. GRIHA is a rating tool which is used to assess the performance of

(A) Business

(B) Buildings

(C) Industries

(D) Education

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COMPETITIVE EXAMINATION-2023

PAPER – II

SUBJECT: ENVIRONMENTAL SCIENCES **SUBJECT CODE:29**

PAPER CODE	DURATION	TOTAL NO. OF QUESTIONS	MAXIMUM MARKS	MENTION YOUR REGISTER NUMBER
ENV202329	TWO HOURS	100	200	

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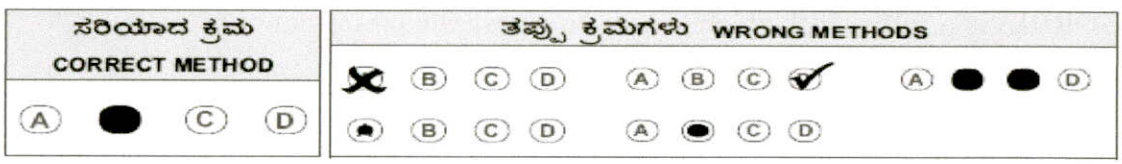
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   - Do not; look inside this question booklet or start answering on the OMR answer sheet.

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2. This question booklet contains **100** questions and each question will have one statement and four different options / responses & out of which you have to choose one correct answer.
3. After the **3rd Bell rings,** remove the paper seal of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
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