



Question Booklet No.

QEV5-06

Written test for the posts of Assistant Professor (Environmental Sciences) against Advt. No.04/2023

Applicant ID Answer Sheet No.....

Name of Applicant: Signature of the Candidate.....

Date of Examinations..... Signature of the Invigilator(s)
1.

2.

Time : 1:30 hrs

Maximum Marks: 50

IMPORTANT INSTRUCTIONS

- I. The question paper is in the form of Test-Booklet containing 50 questions. Each question carries four answers marked (A), (B), (C) and (D), out of which only is correct.
- II. On receipt of the Test-Booklet (Question Paper), the applicant must immediately check it and ensure that it contains all the pages, i.e., 50 questions. Discrepancy, if any, should be reported to the Invigilator immediately after receiving the Test-Booklet.
- III. The separate Answer-Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are separate rows containing four circles each. One row pertains to one question.
- IV. The candidate should write his/her details at the places provided on the cover page of the Test-Booklet/Question Paper and on the Answer-Sheet and NOWHERE ELSE.
- V. No second Test-Booklet/Question Paper and Answer Sheet will be provided. The candidate are advised to be careful in handling it an marking the answer on the Answer-Sheet
- VI. For every correct answer of the question **One (1) mark will be awarded**. For every un-attempted question, Zero (0) mark shall be awarded. **There is no Negative Marking**.
- VII. Marking shall be done only on the basis of answers responded on the Answer-Sheet.
- VIII. To mark the answer on the Answer Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.
- IX. For each question only **one** circle should be **darkened** as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the question will be treated as cancelled.
- X. The candidates should not remove any paper from the Test-Booklet. Attempting to remove any paper shall be liable to be punished for use of unfair means.
- XI. Rough work may be done on the blank space provided in the Test-Booklet/Question Paper only.
- XII. *Mobile phones (even in Switch-off mode) and such other communication/programmable devices are not allowed inside the examination hall.*
- XIII. No candidate shall be permitted to leave the examination hall before the expiry of the time.

Questions paper for the post of Assistant Professor (EVS)

1. The mean free path of molecules/ions in the atmosphere would be maximum/longest at which of the following altitudes in the atmosphere?
 - (A) Lowest 10 km
 - (B) Between 20 to 30 km
 - (C) Between 40 to 50 km
 - (D) Above 100 km
2. Which of the following statement is correct about the Environmental Lapse Rate?
 - (A) Its value is always $10^{\circ}\text{C}/\text{km}$
 - (B) It is a highly variable quantity
 - (C) Its value is always $6.5^{\circ}\text{C}/\text{km}$
 - (D) Its value is always positive
3. If the radiometric resolution of a satellite data is 2^{10} , the maximum DN (digital number) value for a given pixel can be
 - (A) 255
 - (B) 512
 - (C) 1023
 - (D) 511
4. The book "Our Common Future" is famous for which one of the following?
 - (A) The principle of common but differentiated responsibility
 - (B) The concept of Sustainable Development
 - (C) The conservation of wildlife
 - (D) The Gaia Hypothesis
5. The temperature at which the mixing ratio equals the saturation mixing ratio, is called
 - (A) Potential temperature
 - (B) Dry Bulb temperature
 - (C) Dew Point temperature
 - (D) Wet bulb temperature

6. Which of the following statements is correct?
- (A) Dissolved oxygen of a water body is expected to be high when its temperature is low
 - (B) Dissolved oxygen of a water body is expected to be high when its temperature is high
 - (C) Dissolved oxygen of running water is expected to be low regardless of its temperature
 - (D) Dissolved oxygen of a stagnant water body is expected to be on the higher side
7. Wastewater is discharged into a stream of water. According to the Oxygen Sag model suggested by Streeter and Phelps, which of the following conditions would be true at the distance downstream from the point of discharge, where the dissolved oxygen content of the river attains minimum value?
- (A) rate of biological uptake of oxygen is far greater than the rate of reaeration
 - (B) rate of biological uptake of oxygen is greater than the rate of reaeration
 - (C) rate of biological uptake of oxygen is equal to the rate of reaeration
 - (D) rate of biological uptake of oxygen is less than the rate of reaeration
8. Consider the following statements regarding the process of coagulation in water treatment:
- (i) It is a chemical treatment process.
 - (ii) It is useful for the removal of colloidal particles from water.
 - (iii) The intended action of a coagulant is to neutralize the charge on colloidal particles.

Which of the above statements is/are correct? Choose the most appropriate option.

- (A) (i) and (ii) only
 - (B) (ii) and (iii) only
 - (C) (i) and (iii) only
 - (D) (i) (ii) and (iii)
9. Which of the following is **NOT** an example of Persistent Organic Pollutants (POPs)?
- (A) Polybrominated diphenyl ether
 - (B) Isoprene
 - (C) Phthalates
 - (D) Perfluorooctane sulfonate

10. Consider the following statements:

- (i) Dissolved oxygen of a water body without aquatic life is expected to be high when its temperature is low
- (ii) Biochemical Oxygen Demand is always greater than the Chemical Oxygen Demand
- (iii) The transfer of oxygen from the atmosphere to a water body is dependent on the dissolved oxygen deficit in the water body

Identify the correct statements from those given above

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

11. In spectrophotometry, an absorbance of 1 is equivalent to a transmittance of

- (A) 10 %
- (B) 99%
- (C) Zero percent
- (D) 1%

12. Which of the following is **NOT** the characteristic of early successional plant communities?

- (A) They are colonizers
- (B) They are competitors
- (C) They grow rapidly
- (D) They have a short lifespan

13. Endogenous metabolism would be predominant in which of the following phases of microbial growth?

- (A) Lag phase
- (B) Exponential phase
- (C) Log phase
- (D) Death phase

14. In the Lotka-Volterra Model of population growth of two species, the phase difference between the prey and predator species is

- (A) $\pi/6$
- (B) $\pi/2$
- (C) $\pi/3$
- (D) $\pi/4$

15. A species has a major effect on the ecological functions and its elimination would affect many other members of the biological community. Such a species is called:

- (A) Keystone Species
- (B) Pioneer Species
- (C) Climax Species
- (D) Driver Species

16. An interaction in which one organism benefits from the relationship without causing benefit or harm to the other organism, is called which one of the following?

- (A) Symbiosis
- (B) Mutualism
- (C) Commensalism
- (D) Parasitism

17. Which of the following statements about the disease Schistosomiasis is correct?

- (A) This is an air-borne disease caused by a virus
- (B) This is an air-borne disease caused by a bacteria
- (C) This is a water borne disease caused by a bacteria
- (D) This is a water borne disease caused by parasitic worms

18. Consider the following statements:

- (i) At subduction zones, crust is destroyed
- (ii) In mid-oceanic ridges regions, new crust is continuously added to the edges of lithospheric plates
- (iii) The mid-oceanic ridges generally form along the convergent plate boundaries

Identify the correct statements from those given above. Choose the most appropriate option.

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

19. Consider the following statements:

- (i) The inner core of the earth is liquid
- (ii) The outer core of the earth is liquid
- (iii) Rocks in the mantle are primarily iron- and magnesium-rich silicates

Identify the correct statements from those given above. Choose the most appropriate option.

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

20. The shallow water zone around the edge of a water body which supports rooted vegetation is called

- (A) Limnetic zone
- (B) Littoral zone
- (C) Profundal zone
- (D) Benthic zone

21. Which of the following statements about trade winds is correct?

- (A) These winds blow predominantly from the *northeast* in the Northern Hemisphere and from the *southeast* in the Southern Hemisphere.
- (B) These winds blow predominantly from the *northeast* in the Northern Hemisphere and from the *southwest* in the Southern Hemisphere.
- (C) These winds blow predominantly from the *northwest* in the Northern Hemisphere and from the *southeast* in the Southern Hemisphere.
- (D) These winds blow predominantly from the *northwest* in the Northern Hemisphere and from the *southwest* in the Southern Hemisphere.

22. Bituminous Coal is found in which of the following types of rocks?

- (A) Igneous
- (B) Sedimentary
- (C) Metamorphic
- (D) All of the above

23. In geostrophic wind, which of the following conditions would be true?

- (A) The pressure gradient force balances the Coriolis force
- (B) The pressure gradient force exceeds the Coriolis force
- (C) The pressure gradient force is less than the Coriolis force
- (D) The pressure gradient force balances the Centrifugal force

24. Which region of India experiences the maximum number of cyclones?

- (A) East Coast
- (B) West Coast
- (C) Central India
- (D) The Indo-Gangetic Plains region

25. In the context of a lake, a transition layer in which temperature drops rather quickly is called:

- (A) Thermocline
- (B) Epilimnion
- (C) Hypolimnion
- (D) Hyperlimnion

26. Which of the following landforms is formed due to wind erosion?

- (A) Yardangs
- (B) Barchan
- (C) Seif
- (D) Loess

27. Which of the following is **NOT** the strategy adopted by an r-selected species?

- (A) Few, large offspring
- (B) Rapid Growth
- (C) Short life
- (D) Little investment in individual offspring

28. Which of the following types of coal is of the highest rank in terms of carbon percentage?

- (A) Anthracite
- (B) Bituminous
- (C) Lignite
- (D) Peat

29. Which of the following statements regarding the energy production in a nuclear power plant is correct?

- (A) Energy is produced from the process of nuclear fusion.
- (B) Energy is produced from the process of nuclear fission with uncontrolled chain reaction.
- (C) Energy is produced from the process of nuclear fission with controlled chain reaction
- (D) Energy is produced from the process of cold fusion

30. Which of the following places, known for Geothermal Energy, is NOT located in the Himalayan Geothermal Province?

- (A) Puga
- (B) Chumthang
- (C) Manikaran
- (D) Unkeshwar

31. Which of the following gases has the least greenhouse efficiency?

- (A) Carbon dioxide
- (B) Methane
- (C) Sulphur dioxide
- (D) Nitrous Oxide

32. Which of the following would be the most effective in the control of fly ash?

- (A) Gravitational Settling Chamber
- (B) Cyclone
- (C) Wet Scrubber
- (D) Electrostatic Precipitator

33. When a plume of smoke is released in a stable atmospheric layer, which of the following types of plume behaviour would be observed?

- (A) Fanning Plume
- (B) Coning Plume
- (C) Looping Plume
- (D) Lofting Plume

34. Which of the following conditions is NOT favourable for the formation of Urban Heat Island during the night time?

- (A) Cloudy night
- (B) Clear Sky night
- (C) Low wind speed

(D) Reduced Sky View Factor over the Urban Area

35. Which of the following is not an organochlorine pesticide?

- (A) Toxaphene
- (B) Aldrin
- (C) Malathion
- (D) Dieldrin

36. Which of the following statements is correct about the facultative ponds:

- (A) Only the aerobic decomposition takes place
- (B) Only the anaerobic decomposition takes place
- (C) Aerobic decomposition takes place near the top and anaerobic decomposition occurs near the bottom
- (D) Anaerobic decomposition takes place near the top and aerobic decomposition occurs near the bottom

37. Earth derived building materials such as bricks, concrete and tiles can be the source of which of the indoor air pollutant?

- (A) Ozone
- (B) Radon
- (C) Carbon monoxide
- (D) Nitrogen dioxide

38. Which of the following biological treatment methods involves an attached growth process?

- (A) Trickling filters
- (B) Activated sludge processes
- (C) Aerated lagoons
- (D) Aerobic digestion

39. The measured sound pressure level at 5 ft from a radiating point source of noise is 102 dB. What would be the sound pressure level at a distance of 20 ft from the point source along the same radial line?

- (A) 99 dB
- (B) 96 dB
- (C) 90 dB
- (D) 82 dB

40. When converted to the decibel scale, a sound pressure of 2 Pa will correspond to:

- (A) 50 dB
- (B) 80 dB
- (C) 100 dB
- (D) 120 dB

41. Suppose a pharmaceutical company is interested to find if the drug it has manufactured is effective in reducing the blood pressure level. Which of the following statistical tests would be the most appropriate for this purpose:

- (A) Paired- t test
- (B) Chi square test of goodness of fit
- (C) Test of significance of single mean
- (D) Chi square test of independence of attributes

42. Which of the following statements about the standard normal distribution is true?

- (A) Its mean is equal to zero
- (B) Its mean is equal to one
- (C) Its variance is equal to zero
- (D) Its mean is equal to its variance

43. The coefficient of determination R^2 of a linear regression model tells us about:

- (A) The explanatory power of the model
- (B) The correlation among the independent variables
- (C) The correlation among the residuals
- (D) The variance of the independent variable

44. Which of the following is not a valid assumption in the Gaussian Plume Model?

- (A) The rate of emissions from the source is constant
- (B) The wind speed is constant in time
- (C) When the pollutant hits the ground, none of it is absorbed and all is reflected.
- (D) The pollutant is non-conservative

45. A type-I error in hypothesis testing is committed when we:

- (A) Reject null hypothesis (H_0) when it is not true
- (B) Accept null hypothesis (H_0) when it is true
- (C) Accept null hypothesis (H_0) when it is not true
- (D) Reject null hypothesis (H_0) when it is true

46. Which of the following is the smallest reservoir of carbon in the Earth system?
- (A) Terrestrial Biota
 - (B) Marine Biota
 - (C) Atmosphere
 - (D) Soils
47. Among the following aquatic ecosystems, which one has the highest net primary productivity?
- (A) Open Oceans
 - (B) Continental Shelf
 - (C) Estuaries
 - (D) Streams
48. A building that secures 72 points under GRIHA v.2019 rating norms, would get a rating of
- (A) 2 stars
 - (B) 3 stars
 - (C) 4 stars
 - (D) 5 stars
49. Which of the following conditions correctly describes oligotrophic lakes?
- (A) Presence of very little nutrients
 - (B) Presence of medium amount of nutrients
 - (C) Presence of large amount of nutrients
 - (D) Presence of large amount of biomass
50. Regarding future climate change scenario, which of the following Shared Socio-economic Pathways (SSPs) would be the most desirable?
- (A) SSP5
 - (B) SSP1
 - (C) SSP4
 - (D) SSP3

Answer Key – J C Bose

Q. No.	Answer Key	Q. No.	Answer Key
1	D	26	A
2	B	27	A
3	C	28	A
4	B	29	C
5	C	30	D
6	A	31	C
7	C	32	D
8	D	33	A
9	B	34	A
10	C	35	C
11	A	36	C
12	B	37	B
13	D	38	A
14	B	39	C
15	A	40	C
16	C	41	A
17	D	42	A
18	A	43	A
19	B	44	D
20	B	45	D
21	A	46	B
22	B	47	C
23	A	48	C
24	A	49	A
25	A	50	B