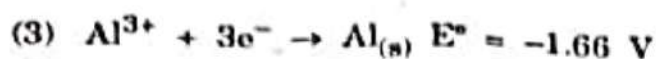
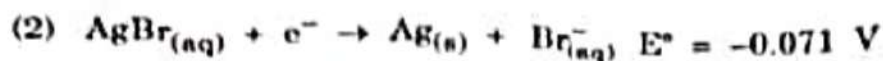
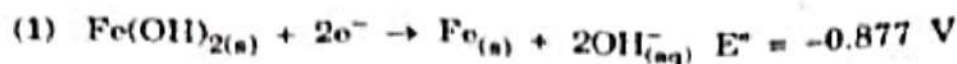


5. For a zero-order reaction, the plot of $[A]_t$ versus t for the reaction $2A \rightarrow B$ is linear with a :
- (A) Positive slope and zero intercept
(B) Positive slope and non-zero intercept
(C) Negative slope and zero intercept
(D) Negative slope and non-zero intercept
6. Which of the following components of cryosphere has the longest life ?
- (A) Sea ice (B) Icebergs
(C) Valley glaciers (D) Ice sheets
7. Which of the following indicators is used to determine total hardness of water ?
- (A) Methyl orange (B) Murexide
(C) Erichrome black T (D) Phenolphthalein

8. Consider the following reactions :



The overall cell reaction for the cell in direction of spontaneous change would be :

- (A) Cell with (1) and (2) Fe reduced & Cell with (1) and (3) Fe reduced
(B) Cell with (1) and (2) Fe reduced & Cell with (1) and (3) Fe oxidised
(C) Cell with (1) and (2) Fe oxidised & Cell with (1) and (3) Fe reduced
(D) Cell with (1) and (2) Fe oxidised & Cell with (1) and (3) Fe oxidised
9. The treatment designed to remove non-biodegradable organic pollutants and mineral nutrients from waste water is called :

- (A) Secondary treatment (B) Lagoons
(C) Imhoff tank (D) Tertiary treatment

10. In a system $\text{A(s)} \rightleftharpoons \text{B(g)} + 2\text{C(g)}$, doubling the equilibrium concentration of B will cause the equilibrium concentration of C to change to :

- (A) Two times its original value (B) One-half its original value
(C) $\sqrt{2}$ times the original value (D) $1/\sqrt{2}$ times the original value

11. As part of National Climate Change Policy, Indian government is planning to raise the installed capacity of renewable energy by the year 2030 to :

- (A) 350 GW (B) 200 GW
(C) 250 GW (D) 175 GW

12. Soil fulvic acids are strong chelators of :

- (A) Iron (II) (B) Iron (III)
(C) Both Iron (II) and Iron (III) (D) $\text{Fe}(\text{OH})_3$

13. The objective of "Paris Agreement" is :

- (A) To protect biodiversity and end the deforestation of the world's rainforests
(B) To keep global temperature rise well below 2°C pre-industrial levels and to pursue a path to limit warming to 1.5°C
(C) To limit sea level rise to 3 feet above current levels
(D) To pursue a goal of 100% clean, renewable energy

14. Which alga can be used as food for the human being ?

- (A) Chlorella (B) Polysiphonia
(C) Ulothrix (D) Spirogyra

16. Pick the correct pairs of viruses and their animals respectively that involve in the interconversion of glucose to glycogen in *Parascaris* and *Ascaris* respectively.

- (A) *Parascaris* and *Ascaris*
- (B) *Parascaris* and *Ascaris*
- (C) *Parascaris* and *Ascaris*
- (D) *Parascaris* and *Ascaris*

17. In what way does biotechnology offer a solution to the problem of food security?

- (A) Bacteria can convert *lactose* into *lactin* which keeps for longer
- (B) Bacteria multiply quickly
- (C) Microorganisms can convert food waste to usable food ingredients
- (D) Microorganisms carry out reactions at low temperatures

18. The correct sequence for the bond order is :

- (A) $N_2 > N_2^+ > O_2 > O_2^+$ (B) $O_2 > N_2^+ > N_2 > O_2^+$
- (C) $N_2 > O_2 > N_2^+ > O_2^+$ (D) $N_2 > N_2^+ > O_2^+ > O_2$

19. A complete, catalytically active enzyme together with its bound coenzyme and/or metal ions is called :

- (A) Apoenzyme (B) Holoenzyme
- (C) Apoprotein (D) Isoenzyme

19. What percentage of the global greenhouse gas emissions does the transportation sector emit ?

(A) 1%

(B) 14%

(C) 33%

(D) 70%

20. Which among the following fertilizers is least likely to affect the soil pH ?

(A) Urea

(B) Rock phosphate

(C) Ammonia

(D) Muriate of potash

21. The osmotic pressure of an aqueous solution containing 30.0 g of a newly-isolated protein in one liter of solution is 12.7 torr at 25°C. What is the approximate molecular weight of the protein in g/mol ?

(A) 333

(B) 44000

(C) 4000

(D) 58

22. Which of the following is *not* a feature of the Eutrophic lakes ?

(A) They are generally occupied by blooms

(B) They have high plant nutrient flux

(C) They have low primary productivity

(D) They are dominated by blue green algae

23. With respect to environment science, full form of SPM is :
- (A) Suspended Partial Matter
 - (B) Suspended Particulate Matter
 - (C) Suspended Pollutant Matter
 - (D) None of the above
24. Global warming can be controlled by :
- (A) Reducing deforestation, cutting down use of fossil fuel
 - (B) Increasing deforestation, slowing down the growth of human population
 - (C) Increasing deforestation, reducing efficiency of energy usage
 - (D) Reducing reforestation, increasing the use of fossil fuel
25. The major source of BaP (Benzo-a-pyrene) in atmospheric environment is :
- (A) Residential wood burning
 - (B) Gasoline
 - (C) Coal tar
 - (D) Cooked meat
26. Which of the following species in the atmosphere is called atmospheric detergent ?
- (A) Chlorine radical
 - (B) Hydroxyl radical
 - (C) Methyl radical
 - (D) Ozone radical

27. The cell membrane :

- (A) Contains metabolic enzymes
- (B) Is selectively permeable
- (C) Regulates the entry and exit of materials
- (D) Contains proteins and phospholipids

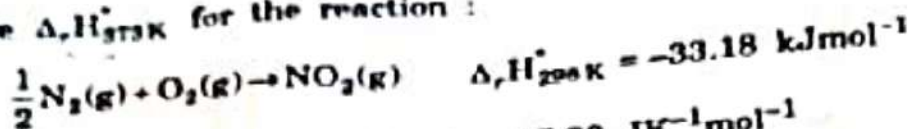
28. Among the following, the irreversible path of citric acid cycle is :

- (A) Oxidation of α -Ketoglutarate to Succinyl-CoA and CO_2
- (B) Formation of Isocitrate via cis-Aconitate
- (C) Oxidation of Succinate to Fumarate
- (D) Oxidation of Malate to Oxaloacetate

29. Which of the following is used as antiknock compound in gasoline ?

- (A) Tetraethyl lead
- (B) Trimethyl lead
- (C) Triethyl lead
- (D) None of these

30. Calculate $\Delta_r H_{298\text{K}}^\circ$ for the reaction :



$$\text{Given : } C_{p,m}(\text{NO}_2, \text{g}) = 37.20 \text{ JK}^{-1}\text{mol}^{-1}$$

$$C_{p,m}(\text{O}_2, \text{g}) = 29.36 \text{ JK}^{-1}\text{mol}^{-1}$$

$$C_{p,m}(\text{N}_2, \text{g}) = 29.13 \text{ JK}^{-1}\text{mol}^{-1}$$

(A) 33.68 kJmol^{-1}

(C) $-36.38 \text{ kJmol}^{-1}$

(B) 36.38 kJmol^{-1}

(D) $-33.68 \text{ kJmol}^{-1}$

31. Montreal protocol to reduce production of chlorofluorocarbons was assigned in :

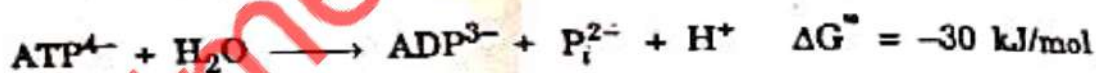
(A) 1985

(C) 1987

(B) 1986

(D) 1982

32. Among the following, the correct statements for the large free-energy change associated with hydrolysis reaction of ATP are :



(i) The charge separation that results from hydrolysis relieves electrostatic repulsion among the four negative charges on ATP.

(ii) Greater degree of solvation (hydration) of the products Pi and ADP relative to ATP.

(iii) The product inorganic phosphate (Pi) is stabilized by formation of a symmetrical resonance hybrid.

(A) (i) and (ii)

(C) (i) and (iii)

(B) (ii) and (iii)

(D) All of these

33. Which of the countries emits the most carbon dioxide ?

(A) China

(B) USA

(C) UK

(D) Russia

34. Drainage basins with thousands of streams and rivers draining into them are also called :

(A) Watersheds

(B) Cairns

(C) Runoff zones

(D) Calderas

35. When the atmospheric temperature becomes nearly equal to the dew point, then relative humidity is equal to :

(A) 100%

(B) 50%

(C) 90%

(D) 0%

36. Which one of the following is *not* a bioindicator of water pollution ?

(A) Sewage fungus

(B) Stone flies

(C) Sludge-worms

(D) Blood-worms

37. Gas molecules that absorb thermal infrared radiation and are present in large quantity to change climate system are known as :

(A) Alpha radiations

(B) Beta radiations

(C) Ozone gases

(D) Greenhouse gases

38. Which vegetation found on rocks and trees could be a low cost way to monitor urban pollution ?

(A) Mosses

(B) Lichen

(C) Algae

(D) Both (B) and (C)

39. In TCA cycle, pyruvate dehydrogenase complex is comprised of a cluster of enzymatically active subunits and coenzymes respectively.

(A) Three, Three

(B) Five, Three

(C) Three, Five

(D) Five, Five

40. The INCORRECT statement regarding fermentation of soybeans to produce soy sauce is

- (A) Because the process is carried out in the absence of oxygen, pyruvate is reduced to lactic acid and ethanol
- (B) If oxygen were present, pyruvate would be oxidized to acetyl-CoA and then to CO_2 and H_2O
- (C) Some of the acetyl-CoA, however, would also be hydrolyzed to acetic acid in the presence of oxygen
- (D) To prevent the soy sauce from having a strong vinegar taste, oxygen must be supplied in the fermentation tank

41. In India, Environmental Impact Assessment report of a proposed river valley project after environmental clearance is applicable for a maximal period of how many years ?

- (A) 2 (B) 5
- (C) 30 (D) 10

γ - γ - UV - visible light

42. The wavelength range of UV-C radiations is :

- (A) 200-280 nm (B) 180-240 nm
- (C) 320-400 nm (D) 240-300 nm

47. Of the following ~~at which~~ place does the Sutlej river touch the Kullu district of Himachal Pradesh ?

(A) Nirmand

(B) Bhuntar

(C) Naggar

(D) Seobagh

48. Of the following districts of Himachal Pradesh which had the highest female sex ratio according to Census-2011 ?

(A) Shimla

(B) Kinnaur

(C) Lahaul-Spiti

(D) Kangra

49. Which of the following places of Himachal Pradesh is *not* matched correctly with its district ?

(A) Darchu-Lahaul-Spiti

(B) Bajaura-Kullu

(C) Killar-Mandi

(D) Lippa-Kinnaur

50. Which of the following two districts of Himachal Pradesh were ranked first and second in power index in District Good Governance Index 2021 ?
- (A) Bilaspur and Kangra (B) Una and Hamirpur
(C) Mandi and Shimla (D) Nahan and Kullu
51. Which percentage of population of Himachal Pradesh is supported by Agriculture and its allied sector as per Periodic Labour Force Survey, Financial Year 2021-22 ?
- (A) 57.03 (B) 54.05
(C) 57.09 (D) 56.07
52. How much development budget outlays was approved for Dairy Development in Himachal Pradesh for 2022-23 ?
- (A) 32.10 crore (B) 28.05 crore
(C) 30.51 crore (D) 28.70 crore
53. In which of the following Annual Plan, the growth rate of Himachal Pradesh was highest as per its Economic Survey 2022-23 ?
- (A) 2019-20 (B) 2021-22
(C) 2022-23 (D) 2018-19

54. The total Sub-divisions of Himachal Pradesh on 31.03.2020, were :

(A) 70

(B) 75

(C) 65

(D) 73

55. The district of Himachal Pradesh from where a woman was elected an MLA in its election of 2022 is :

(A) Sirmaur

(B) Shimla

(C) Kangra

(D) Kullu

56. The district of Himachal Pradesh having longest border with Tibet (China) is :

(A) Lahaul-Spiti

(B) Shimla

(C) Kullu

(D) Kinnaur

57. Consider the following about Bhavanl Dutt Shastri, a Sanskrit Scholar of Mandi (Himachal Pradesh) :

- (i) He translated Shrimad Bhagavad Geeta in Mandyali.
- (ii) He also translated the Upanishad and Vedanta Philosophy in Mandyali.
- (iii) He was awarded the highest award of Gyan Sagar by Sahitya Academy in New Delhi.

Choose the correct answer from the following codes :

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

58. Which of the following temples of Himachal Pradesh is *not* matched correctly with its district ?

- (A) Panchvaktra Temple—Mandi ✓
- (B) Maheshwar Temple—Kinnaur
- (C) Jatoli Shiva Temple—Solan ✓
- (D) Baba Garib Nath Temple—Kangra

59. Which of the following members of Haryana Mandal movement of Himachal Pradesh is not matched correctly with the district?

- (A) Daulat Ram Sankhyan-Bilaspur
- (B) Hira Singh Pal-Kullu
- (C) Karam Singh Thakur-Mandi
- (D) Surat Singh Vaid-Sirmaur

60. Which of the following is correct about the Har form of marriage in Kinnaur (Himachal Pradesh) ?

- (A) Enticing away someone's wife
- (B) Arranged marriage
- (C) Forcible taking away the bride
- (D) Marriage with wife's sister

61. The Sukh-Ashray Sahayata Kosh has been set up by the Himachal Pradesh government by keeping a sum of Rs.

- (A) 51 crore
- (B) 75 crore
- (C) 101 crore
- (D) 151 crore



62. The district of Himachal Pradesh, which has the lower Violent Crime Index, as per the District Good Governance Index-2021 :

(A) Shimla

(B) Hamirpur

(C) Solan

(D) Chamba

63. The districts of Himachal Pradesh where no foreign tourists arrived in the year 2022 :

(A) Bilaspur and Hamirpur

(B) Bilaspur and Chamba

(C) Mandi and Hamirpur

(D) Una and Sirmaur

64. How many meritorious girl students of all streams of Himachal Pradesh have been benefitted under Kalpana Chawla Chatravriti Yojana for their post 10+2 courses, according to Economic Survey (Himachal Pradesh), 2022-23 ?

(A) 1570

(B) 1655

(C) 1792

(D) 1836

65. In Khelo India Youth Games-2022, Himachal Pradesh did not get more gold medals than which of the following states ?

(A) Andhra Pradesh

(B) Assam

(C) Telangana

(D) Chhattisgarh

66. Which of the following ~~Indian~~ Institutes of Technology was inaugurated in 1951 ?

(A) Madras (Chennai)

(B) Kanpur

(C) Kharagpur

(D) Bombay (Mumbai)

67. Which of the following was pledged by India at the COP-26 (2021), Conference held in Glasgow (Great Britain) regarding bringing an end to all emissions ?

(A) By 2075

(B) By 2070

(C) By 2040

(D) By 2060

68. The total Schedules in Indian Constitution are :

(A) 10

(B) 11

(C) 14

(D) 12

69. Which of the following is correct about Goa ?

(A) It was conferred statehood in 1987

(B) It has a forest cover of 25 p.c.

(C) It has no wildlife sanctuary

(D) It was liberated and later made a composite Union Territory with Daman and Diu in 1971

70. Which of the following country's Men Hockey Team was defeated by Indian team in the Final Asian Champions Trophy-2023 ?

(A) Pakistan

(B) South Korea

(C) China

(D) Malaysia

71. Which of the following countries has not sent the manned mission to space ?

(A) U.S.A.

(B) Russia

(C) Great Britain

(D) China

72. The number of Nations, which are the members of NATO, upto March, 2023 is :
- (A) 27 (B) 31
(C) 29 (D) 34
73. Who defeated Novak Djokovic in Wimbledon, July 23 Men's Singles in final ?
- (A) Carlos Alcaraz (B) Roger Federer
(C) Boris Becker (D) Rafael Nadal
74. Which of the following countries is not matched correctly with its continent ?
- (A) Syria-Asia
(B) Monaco-Africa
(C) Vatican-Europe
(D) Costa Rica-North America
75. How many bridges do the Amazon, the second longest river of world have over it ?
- (A) Five (B) Seven
(C) Four (D) None of these

PART-II

(A-Chemistry)

76. The nucleus of an atom is located at $x = y = z = 0$. If the probability of finding an s-orbital electron in a tiny volume around $x = a, y = z = 0$ is 1.0×10^{-4} , the probability of finding the electron in the same sized volume around $x = z = 0, y = a$ is :

(A) Zero

(B) 1.0×10^{-5}

(C) a

(D) a^2

77. The density of CaF_2 (fluorite structure) is 3.18 g/cm^3 . The length of the side of the unit cell is :

(A) 253 pm

(B) 344 pm

(C) 546 pm

(D) 273 pm

78. Choose the correct statement :

(A) $\text{HF} > \text{HCl} > \text{HBr} > \text{HI}$ (Acid strength)

(B) $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3$ (Bond angle)

(C) $\text{HClO} < \text{HOClO} < \text{HOClO}_2 < \text{HOClO}_3$ (Oxidizing nature)

(D) PCl_5 exist as $[\text{PCl}_6]^- [\text{PCl}_4]^+$ in solid state

79. A neutron has almost 2000 times the mass of an electron. Suppose they both have 1 eV of energy. How do their de-Broglie wavelengths compare ?

(A) $\lambda_n = \lambda_e$

(C) $\lambda_n > \lambda_e$

80. If an electron in hydrogen atom jumps from an orbit level $n_1 = 3$ to an orbit level $n_2 = 2$, the emitted radiation has a wavelength given by :

(A) $36/5R$

(B) $5R/36$

(C) $6/R$

(D) $R/6$

81. Which of the following particles moving with the same velocity would be associated with the smallest de-Broglie wavelength ?

(A) Hydrogen molecule

(B) Oxygen molecule

(C) Helium molecule

(D) Nitrogen molecule

82. Which is the common node for all orbitals ?

(A) x, y, z -axis

(B) xy plane

(C) yz plane

(D) Nucleus

83. The threshold wavelength for photoelectric emission from lithium, above which no electrons are emitted, is 520 nm. Calculate the velocity of electrons emitted as the result of absorption of light at 360 nm.

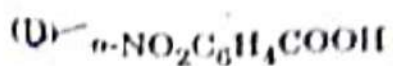
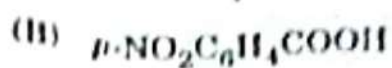
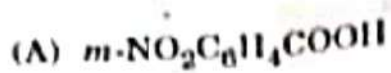
(A) $6.1 \times 10^6 \text{ ms}^{-1}$

(B) $3.1 \times 10^5 \text{ ms}^{-1}$

(C) $6.1 \times 10^5 \text{ ms}^{-1}$

(D) $3.1 \times 10^6 \text{ ms}^{-1}$

84. Amongst the following acids, which has the lowest pKa value ?



85. Generation of carbene can be accomplished by :

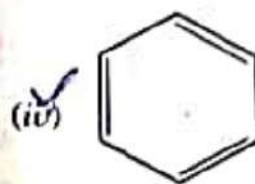
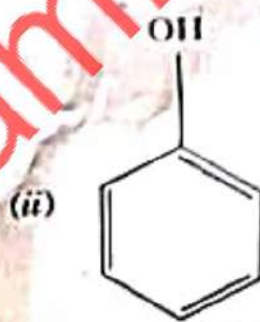
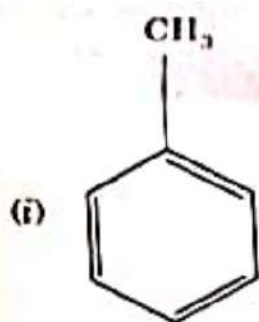
(A) Photolysis of ketene

(B) Photolysis of diazomethane

(C) Reimer-Tiemann Reaction

(D) All of these

86. Arrange the following in increasing order of reactivity towards bromination :



(A) (ii) > (i) > (iii) > (iv)

(B) (ii) > (i) > (iv) > (iii)

(C) (i) > (ii) > (iv) > (iii)

(D) (iii) > (i) > (ii) > (iv)

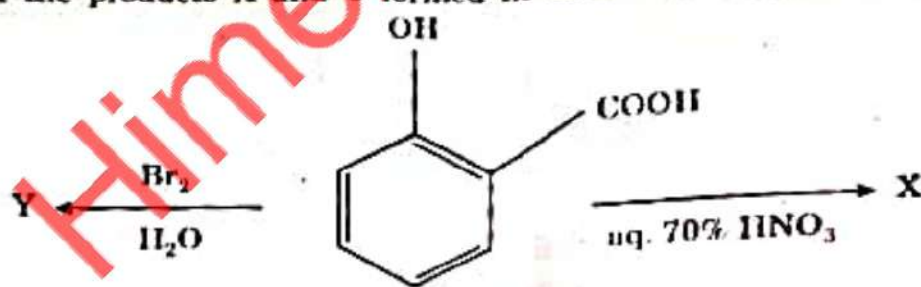
87. Which of the following alkanes has the ability to exhibit optical activity ?

- (A) 3-Methylhexane (B) Isopentane
(C) 3-Methylpentane (D) Neopentane

88. S_N2 reactions are considered as :

- (A) Stereoselective Reactions (B) Stereospecific Reactions
(C) Both (A) and (B) (D) Regioselective

89. Predict the products X and Y formed in the following reaction :



- (A) X = o-nitrophenol; Y = p-bromophenol
(B) X = 3-nitrosalicylic acid; Y = 4-bromosalicylic acid
(C) X = 5-nitrosalicylic acid; Y = 2, 4, 6-tribromophenol
(D) X = p-nitrophenol; Y = o-bromophenol

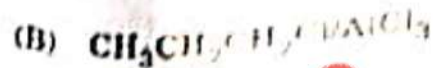
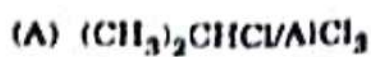
90. There are three monomers : M1, M2 and M3; M1 contains one triple bond and no functional group. M2 contains one reactive functional group and one double bond, and M3 contains two reactive functional groups and one triple bond. Which statement is true ?

- (A) All three monomers can be polymerized via addition and condensation polymerization
- (B) M1 can be polymerized via addition, M2 cannot be polymerized, and M3 can be polymerized via condensation
- (C) M1 can be polymerized via addition, and both M2 and M3 can be polymerized via condensation
- (D) None of the monomers are polymerizable

91. NaBH_4 is frequently employed as an important reagent in reducing a ketone because :

- (A) It is good for hydrolysis type reactions
- (B) It is a good source of the hydride ion (H^-)
- (C) It can act as a base
- (D) It can act as a free radical initiator

92. Upon reaction with benzene, which of the following combinations does not render isopropylbenzene as the product :



93. Classify the following reaction as :



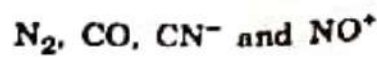
(A) Substitution

(B) Rearrangement

(C) Redox

(D) Both (B) and (C)

94. Which of the following statements is true for the species given below ?



(A) All the species are paramagnetic

(B) All the species are diamagnetic

(C) All the species have dipole moment

(D) All the species are linear

$1s^2 2s^2 2p^3$
 $1s^2 2s^2 2p^2$ Param

95. Which one is not a correct statement ?

- (A) Bond length in N_2^+ is less than N_2
- (B) O_2 has lower dissociation energy than O_2^+
- (C) N_2 has greater dissociation energy than N_2^+
- (D) Bond length in NO^+ is less than in NO

96. Which of the following species are diamagnetic ?

(i) C_2

(ii) O_2^{2-}

(iii) Li_2

(iv) N_2^+

(A) (i) and (ii)

(B) (i), (ii) and (iii)

(C) (i), (ii), (iii) and (iv)

(D) (i), (iii) and (iv)

97. Which of these species has unpaired electrons ?

(i) O_2

(ii) O_2^-

(iii) O_2^{2-}

(A) (ii) only

(B) (iii) only

(C) (i) and (ii) only

(D) (i) and (iii) only

PART-II

(B-Environmental Science)

76. Which of the following is considered the most effective approach to reducing greenhouse gas emissions ?
- (A) Increasing renewable energy production
 - (B) Implementing carbon capture and storage technology
 - (C) Promoting energy efficiency and conservation
 - (D) Adopting nuclear power as the primary energy source
77. What is the primary cause of coral bleaching in marine ecosystems ?
- (A) Overfishing and destructive fishing practices
 - (B) Pollution from industrial activities and oil spills
 - (C) Ocean acidification due to increased carbon dioxide levels
 - (D) Rising sea temperatures caused by climate change

78. What is the main purpose of an environmental impact assessment (EIA) ?
- (A) To assess the economic feasibility of a development project
 - (B) To evaluate the potential environmental consequences of a proposed project
 - (C) To determine the social and cultural impacts of a development initiative
 - (D) To monitor and enforce compliance with environmental regulations
79. Which of the following is a characteristic of an igneous rock ?
- (A) It forms from the compaction and cementation of sediment
 - (B) It is formed by the cooling and solidification of molten material
 - (C) It is a rock that has undergone intense heat and pressure
 - (D) It is primarily composed of organic remains
80. Which of the following is a technique used to extract natural gas from shale formations ?
- (A) Fracking (hydraulic fracturing)
 - (B) Strip mining
 - (C) Open-pit mining
 - (D) Solution mining

81. What is the term used to describe the gradual sinking of Earth's crust in response to the removal of large amounts of groundwater ?
- (A) Subsidence (B) Uplift
(C) Erosion (D) Faulting
82. Which ISO standard is focused on energy management systems ?
- (A) ISO 9001 (B) ISO 14001
(C) ISO 27001 (D) ISO 50001
83. Which GIS data model represents spatial features as a series of points, lines, and polygons ?
- (A) Raster data model (B) Vector data model
(C) Topological data model (D) Network data model
84. Which of the following causes warming of atmosphere but cooling of the earth's surface ?
- (A) Ozone (B) Black carbon aerosols
(C) All greenhouse gases (D) Sulphates and nitrates

85. Asphyxiation is caused by :

(A) HCN, COCl₂

(B) NO_x

(C) CHCl₃

(D) AsH₃

86. The main source of Dioxins is :

(A) Incineration

(B) Landfills

(C) Agriculture refuse burning

(D) Road transport

87. What is the primary factor responsible for the formation of karst topography, including sinkholes and caves ?

(A) Volcanic activity

(B) Glacial erosion

(C) Chemical weathering of limestone

(D) Tectonic plate movement

88. What is the primary purpose of an environmental audit ?
- (A) Identifying potential sources of pollution
 - (B) Evaluating compliance with environmental regulations
 - (C) Assessing the environmental impact of an organization's activities
 - (D) All of the above
89. When animals advertise that they are noxious or dangerous by bright, conspicuous colours and patterns it is known as :
- (A) Aposematism
 - (B) Crypsis
 - (C) Mimicry
 - (D) Allelopathy
90. What is Carbon Levy ?
- (A) It's a tax levied on jet and shipping fuel to finance climate change mitigation
 - (B) It's a tax levied on carbon fuel
 - (C) It's a tax levied on production of fossil fuel and coal
 - (D) It's a tax levied on production of coal only

91. The Chenchu people in India have been active in protection of wildlife in which among the following protected areas of India ?

(A) Nagarjunasagar Erisallam (Andhra Pradesh)

(B) Simlipal (Odisha)

(C) Indravati, Udanti-Sitanadi (Chhattisgarh)

(D) Palamu (Jharkhand)

92. Musa paramjitiana is a species of which fruit ?

(A) Wild banana

(B) Wild apple

(C) Wild papaya

(D) Wild guava

93. Which of the following pairs are correctly matched ?

Pollutant

Disease

(1) Arsenic

Skin Cancer

(2) Lead

Itai-Itai

(3) Cadmium

Dyslexia

Select the correct answer from the following codes :

(A) Only (1)

(B) Only (1) and (2)

(C) Only (2) and (3)

(D) (1), (2) and (3)

94. The provisions of environmental protection in the Constitution were under :
- (A) Article 5-A
 - (B) Article 41-B
 - (C) Article 27-B (h)
 - (D) Article 48-A and Article 51-A (g)
95. Rachel Carson pointed out the dangers of :
- (A) Soil Erosion
 - (B) Malaria
 - (C) Climate Change
 - (D) DDT
96. Which one of the following reflects more sunlight as compared to other three ?
- (A) Fresh snow
 - (B) Sand desert
 - (C) Paddy cropland
 - (D) Oceans

97. Basel Convention mainly deals with

- (A) Biological diversity
- (B) Hazardous wastes and their disposals
- (C) Persistent organic pollutants
- (D) Ozone depleting

98. What is the full form of ENMOD ?

- (A) Environmental Middle Convention
- (B) Environmental Modification Convention
- (C) Environmental Middle Centre
- (D) Environmental Modification Centre

99. The mountain Biomes are called :

- (A) Psammobiomes
- (B) Orobiomes
- (C) Lithobiomes
- (D) Pedobiomes

100. Modern concept of sustainable development focuses more on :

- (A) Economic development
- (B) Social development
- (C) Environmental protection
- (D) All of these

PART-II.
(C-Microbiology)

76. The biodegradation of plant material is slow because of the presence of :
- (A) Lignin (B) Xylene
(C) Cellulose (D) Protein
77. The widely used aerobic suspension type of liquid waste treatment system is :
- (A) Percolating filter
(B) Septic tank
(C) Rotating Biological Contactor (RBC)
(D) Activated sludge process
78. Common indicator organism of water pollution is :
- (A) *Lemna paucicostata* (B) *Escherichia coli*
(C) *Eichhornia crassipes* (D) *Entamoeba histolytica*
79. Which of the following organisms is nitrogen-fixing and found in rice fields in symbiotic association with *Azolla* ?
- (A) Frankia (B) Tolypothrix
(C) Spirulina (D) Anabaena

80. Which of the following organisms is used in alcoholic fermentation ?
- (A) Pseudomonas (B) Aspergillus
(C) Saccharomyces (D) Penicillium
81. Which of these bacterial components is least likely to contain useful antigens.?
- (A) Cell wall (B) Flagella
(C) Ribosomes (D) Capsule
82. The association of endotoxin in gram-negative bacteria is due to the presence of :
- (A) Steroids (B) Peptidoglycan
(C) Lipopolysaccharides (D) Polypeptide
83. Which of the following enzymes in bacteria are responsible for restricting the growth of viruses ?
- (A) Restriction endonuclease (B) Topoisomerase
(C) Gyrase (D) Protease

84. What disease is caused by *Coxiella burnetii* ?

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(A) Q Fever

(B) Tuberculosis

(C) Diphtheria

(D) Walking pneumonia

85. Which microbial virulence factor is most important for attachment to host respiratory tissues ?

(A) Adhesins

(B) Lipopolysaccharide

(C) Hyaluronidase

(D) Capsules

86. Which of the following is true for Gram-negative bacteria ?

(A) Upon alcohol treatment, the permeability of the cell wall increases

(B) Crystal violet-iodine (CV-I) complex is extracted

(C) Pore size decreases and the CV-I complex cannot be extracted

(D) Alcohol treatment increases the permeability of the cell wall and the CV-I complex can be extracted

87. Lactase enzyme can be immobilised and used to produce lactose-free milk. What are the products of the reaction catalysed by lactase ?
- (A) Fructose and glucose (B) Fructose and sucrose
(C) Galactose and fructose (D) Galactose and glucose
88. Which statement defines cloning ?
- (A) Making offspring identical to one parent
(B) Producing identical plants and animals by natural or artificial means
(C) Producing genetically identical copies of an individual, cell or gene
(D) Splitting embryos to make twins
89. Which phage is used for phage display technique ?
- (A) T7 (B) M13
(C) λ -phage (D) ϕ 6
90. The bacterial genus where sterols are present in the cell membrane is :
- (A) Vibrio (B) Mycoplasma
(C) Escherichia (D) Chlamydia

91. Prokaryotic cells are more resistant to osmotic shock than eukaryotic cells because :
- (A) Their cell wall is composed of peptidoglycan
 - (B) They are selectively permeable
 - (C) They contain osmoregulating porins
 - (D) They block water molecules from entering the cell
92. The coagulase is done to differentiate :
- (A) *Staphylococcus aureus* from *Staphylococcus epidermidis*
 - (B) *Staphylococcus epidermidis* from *Neisseria meningitidis*
 - (C) *Streptococcus pyogenes* from *Enterococcus faecalis*
 - (D) *Streptococcus pyogenes* from *Staphylococcus aureus*
93. The bacterium that infects other gram-negative bacteria is :
- (A) *Proteus mirabilis*
 - (B) *Haemophilus influenza*
 - (C) *Bdellovibrio*
 - (D) *Pseudomonas putida*

94. Which of the following microorganism is not responsible for urinary tract infection ?

- (A) *Proteus mirabilis*
- (B) *Escherichia coli*
- (C) *Klebsiella pneumoniae*
- (D) *Bacteroides fragilis*

95. Which of the statements regarding gram staining is wrong ?

- (A) *Mycobacterium tuberculosis* stains blue because of the thick lipid layer
- (B) *Streptococcus pyogenes* stains blue because of a thick peptidoglycan layer
- (C) *Escherichia coli* stains pink because of a thin peptidoglycan layer
- (D) *Mycoplasma pneumoniae* is not visible in the Gram's stain because it has no cell wall

96. Which of the following contains structures composed of N-acetylmuramic acid and N-acetylglucosamine ?

- (A) *Mycoplasmas*
- (B) *Amoeba*
- (C) *E. coli*
- (D) *Spheroplast*

97. Which of the following is a gram-positive eubacterium ?

- (A) *Actinomyces*
- (B) *Clostridium*
- (C) *Rhizobium*
- (D) *Clostridium, actinomyces*

98. Which of the following is/are the symptoms of Black Fungus ?

(1) Facial Swelling

(2) Nasal Congestion

(3) Headache

(A) Only (1)

(B) Both (2) and (3)

(C) Only (2)

(D) (1), (2) and (3)

99. (1) When a virus does not change is called a mutation.

(2) A virus with one or more new mutations is known as a "variant" of the original virus.

Which of the following statements is/are correct ?

(A) Only (1)

(B) Only (2)

(C) Both (1) and (2)

(D) Neither (1) nor (2)

100. Molds causing spoilage of eggs include species of :

(A) Cladosporium

(B) Mucor

(C) Thamnidium

(D) All of these