

# PUNJAB PUBLIC SERVICE COMMISSION

Objective Type Test (May-2023) for Recruitment to the Post of Assistant Scientific Officer (Group A) in the Department of Science, Technology and Environment, Govt. of Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Total Questions: 120  
Time Allowed: 2 Hours

Candidate's Name \_\_\_\_\_

Father's Name \_\_\_\_\_

Date of Birth        
DD MM YYYY

OMR Response Sheet No. \_\_\_\_\_

Roll No. \_\_\_\_\_

Candidate's Signature (Please sign in the box)

Question Booklet Set
<b>A</b>
Booklet Series

## INSTRUCTIONS

1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant boxes out of 1 to 9 of the Optical Mark Reader (OMR) response sheet, supplied separately.
2. Use only blue or black **ball point pen** to fill the relevant columns on this page as well as in OMR sheet. Use of Ink pen or any other pen is not allowed.
3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible or incomplete.
4. Each candidate is required to attempt 120 questions in 120 minutes, except for orthopedically/visually impaired candidates, who would be given 40 extra minutes, for marking correct responses on the OMR sheet.
5. The question paper booklet has 22 pages.
6. The candidates, when allowed to open the question paper booklet, must first check the entire booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should IMMEDIATELY bring this fact to the notice of the Invigilation Staff and obtain a new booklet of the same series as given earlier.
7. The serial number of the new Question booklet if issued for some reason should be entered in the relevant column of the OMR. The Invigilation Staff must make necessary corrections in their record regarding the change in the serial no. of Question booklet.
8. The paper consists of total 480 Marks. Each question shall carry 4 marks. There are four options for each question and the candidate has to mark the MOST APPROPRIATE answer on the OMR response sheet.
9. There is negative marking (1 mark for each question) for questions wrongly answered by the candidate.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidate **MUST READ INSTRUCTIONS BEHIND THE OMR SHEET** before answering the questions and check that two carbon copies attached to the OMR sheet are intact.

1. The general conditions for using “Autoclave” during sterilization of samples in a microbiology laboratory are
  - a) Temperature = 121 °C, Pressure = 15 psi
  - b) Temperature = 15 °C, Pressure = 121 psi
  - c) Temperature = 100 °C, Pressure = 10 psi
  - d) Temperature = 121 °C, Pressure = 25 psi
  
2. During microbial growth, the phase during which microbes are adapted to the environment is called
  - a) Exponential Phase
  - b) Log Phase
  - c) Lag Phase
  - d) Stationary Phase
  
3. Among the following, Fecal indicator bacteria is
  - a) *Pseudomonas aeruginosa*
  - b) *Bacillus subtilis*
  - c) *Salmonella typhi*
  - d) *Escherichia coli*
  
4. Agar-agar used in microbiology laboratory is mainly obtained by
  - a) Golden algae
  - b) Red algae
  - c) Yeast
  - d) Cyanobacteria
  
5. The poisoning of central nervous system with organic mercurial is known as
  - a) Minamata disease
  - b) Methamoglobinemia
  - c) Both of the above
  - d) None of the above
  
6. Identify the incorrect statement about carbon isotopes
  - a) C-13 is less abundant in vegetation than in ocean
  - b) C-12 is most abundant in nature
  - c) C-14 is absent in fossil fuel
  - d) C-13 is used for carbon –dating
  
7. Corona-virus structure is composed of
  - a) outer protein coat and central core of nucleic acid
  - b) outer nucleic acid and proteinous central core
  - c) outer proteinous coat and central DNA core
  - d) outer proteinous coat and central RNA

8. Whenever there is high BOD, DO is less so much that fish cannot survive in lake water because
- Fish utilize all Oxygen
  - Bacteria utilize all Oxygen
  - Algae utilize all oxygen
  - Biological compound are toxic to fish
9. Arsenic problem in India is primarily due to
- Over exploitation of Arsenopyrite in the hinterland
  - Over exploitation of coal in Bihar and West Bengal
  - Over exploitation of groundwater in affected areas
  - Over exploitation of surface water in the affected area
10. When the industry with 'Red' Category is to be established, it is necessary to have a public hearing or inquiry under the procedure called as
- Environmental Health Hazard (EHH)
  - Environmental Litigation (EL)
  - Environmental Management Systems (EMS)
  - Environmental Impact Assessment (EIA)
11. The bacteria responsible for deposition of iron oxide in water pipes is
- Gallionella*
  - Klebsiella*
  - Thermococcus*
  - Heliocobacter*
12. Which of the following is true?
- Benzene hexachloride is a non biodegradable pollutant
  - Carbon dioxide is a primary air pollutant
  - Sulphur dioxide causes brown air effect during traffic congestion in cities
  - Anthropogenic air pollutants are natural in origin
- i and ii only
  - ii and iii only
  - i and iv only
  - iii and i only
13. Severe drought is declared if
- Deficit of rainfall is more than 50 percent of the normal
  - Deficit of rainfall caries between 25- 45 percent of the normal
  - Rainfall deficit exceed 25 percent of the normal
  - Rainfall deficit is between 15 -25 percent

14. C<sub>4</sub> plant are commonly found in
- a) Humid and low temperature environment
  - b) Arid and hot environment
  - c) Temperate environment
  - d) Semi-humid environment
15. Recently implemented UN Sustainable Development Goal (SDG) has how many goals to achieve by 2030?
- a) 10
  - b) 17
  - c) 30
  - d) None of the above
16. According to IPCC, during the 20<sup>th</sup> century earth's mean surface temperature has risen by approximately
- a) 0.4<sup>o</sup>C
  - b) 0.6<sup>o</sup>C
  - c) 0.8<sup>o</sup>C
  - d) 1.0<sup>o</sup>C
17. Green Climate Fund (GCF) is established to limit or reduce emission in
- a) Developing countries
  - b) NATO member countries
  - c) Ukraine war effected areas
  - d) Developed countries
18. The Polluter pay principle was first conceptualized by the
- a) G 20 countries
  - b) OECD countries
  - c) European countries
  - d) America
19. Which gas is produced from the guts of cattle that is a major greenhouse gas?
- a) CO<sub>2</sub>
  - b) CFC
  - c) Halons
  - d) Methane
20. Ozone depletion in the Stratosphere may not create which of the following problem in human being?
- a) Liver disease
  - b) Anemia
  - c) Eye Cataracts
  - d) Skin Cancer

21. Montreal Protocol is a multilateral environmental agreement related to control the Ozone layer depletion was adopted in which year ?
- 1992
  - 1987
  - 1999
  - 2006
22. A current news articles writes “Climate change making Earth uninhabitable...” Guterres warns. Who is Antonio Guterres ?
- Environment Minister of South Africa
  - UN Secretary- General
  - Canadian Environment minister
  - Famous Nobel recipient on Environment
23. “Where there is a risk of severe damage to the environment but absence of any scientific or conclusive proof for the reason , we must stop that activity being safe than sorry”, was given in Rio Declaration of 1992. This is related to
- Green Wash
  - Deep Ecology
  - Precautionary principle
  - Blue risk principle
24. In the Paris Agreement of Climate change, India has taken its pledge that it will reduce the emission intensity of its GDP by 2030 at level of
- 45%
  - 30%
  - 25%
  - 19%
25. Which article of the Indian constitution directs that the State shall endeavour to Protect and improve the environment and to safeguard the forest and wildlife of the country
- 51 A
  - 12 B
  - 48A
  - 8A
26. A developmental project requires both environmental clearance as well as approval under
- Water act, 1974
  - Forest Conservation Act,1980
  - National Environmental Tribunal Act,1995
  - Air Act, 1981
27. According to Environment (Protection) Act,1986 permissible limits of oil and grease in the effluents to be discharged into public sewers is
- 10 mg/ l
  - 20 mg / l
  - 25 mg/ l
  - 30 mg/ l

28. The title of the Brundtland report is
- Caring for Earth
  - Caring of Biosphere
  - Our common Future
  - The Silent space
29. Under the Air Act 1981, which body is empowered to set standard for ambient air quality?
- MoEF &CC
  - State Pollution Control Board
  - Central Pollution Control Board
  - Ministry of Road Transport
30. Access Benefit Sharing (ABS) is an important component in the Environmental legislation of
- FCA 1980
  - Water Act,1974
  - Environment (Protection ) Act 1986
  - Biodiversity Act,2002
31. The Project Snow leopard, was launched in India to safeguard and conserve the high altitude habitat for the animal in the year
- 2015
  - 2005
  - 2011
  - 2009
32. What is the key difference between the Forest (conservation) Act 1980 and Indian Forest Act 1927?
- The Forest (conservation) Act 1980, came in to force to address deforestation, whereas Indian Forest Act 1927 was geared to allow the colonial British administration to control extraction of timber.
  - Tribal people were given more rights in Forest conservation Act,1980 but in IFA,1927 has no power to tribals stay around forest.
  - FCA,1980 focused more of wildlife protection but IFR,1927 was more of Timber protection
  - No one is correct
33. In a frequency distribution, the median and mean is 15 and 12 respectively, find the mode.
- 11
  - 21
  - 41
  - 45

34. What is the difference between Type I and Type II errors in statistical hypothesis testing?
- Type I error occurs when we reject a null hypothesis that is true, while Type II error occurs when we accept a null hypothesis that is false.
  - Type I error occurs when we accept a null hypothesis that is false, while Type II error occurs when we reject a null hypothesis that is true.
  - Type I error occurs when we reject a null hypothesis that is false, while Type II error occurs when we accept a null hypothesis that is true.
  - Type I error occurs when we accept a null hypothesis that is true, while Type II error occurs when we reject a null hypothesis that is false.
35. If the standard deviation of a data is 0.012. Find the variance.
- 0.144
  - 0.00144
  - 0.000144
  - 0.0000144

36. Consider the following unclassified frequency distribution

X:	Frequency
1	8
2	10
3	11
4	16
5	20
6	25
7	15
8	9
9	6

The median of the above given unclassified frequency distribution is

- 1
  - 2
  - 5
  - 7
37. If  $y^2 = 4x$  and 0.1% error is incurred for  $y$ , the percentage error involved in  $x$  will be
- 0.4
  - 0.025
  - 0.1
  - 0.05

38. In which of the following activities silicon carbide is used?
- Making cement and glass
  - Disinfecting pond water
  - Making casts for statues
  - Cutting very hard substances
39. *Lantana camara*– know as Phool Lakhri in local parlance is a shrub found in abundance in Himachal Pradesh. Which of the following statements are correct about it?
- 1.It is a toxic weed and has affected the mountain diversity of the state.
  - 2.Lantana species are widely cultivated for their flowers.
  - 3.It is endemic to India.
  - 4.It is considered as potential fire hazard and it is combustible even when green.
- 1 & 3 only
  - 2 & 4 only
  - 1, 2 & 4 only
  - 1, 2, 3 and 4
40. Which article of the CBD states that, “*as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species*”.
- Article 8(d)
  - Article 8(h)
  - Article 9(d)
  - Article 9(h)
41. Which one of the following is not a bio-indicator of water pollution?
- Blood-worms
  - Sludge-worms
  - Sewage fungus
  - Stone flies
42. The accumulation of partially decayed vegetation or organic matter in wet areas results in the formation of
- Moss
  - Peat
  - Coal
  - Fossils
43. Relative contributions of CO<sub>2</sub>, CH<sub>4</sub>, CFCs and N<sub>2</sub>O towards global warming are:
- 50 %, 30 %, 10 % , and 10 % respectively
  - 60%, 20%, 14%, and 6% respectively
  - 40 %, 30%, 20% and 10% respectively
  - 35 %, 15%, 10% and 5% respectively



44. Which one of the following treaty is related to the control of trans-boundary movements of hazardous wastes and their disposal?
- Basel Convention
  - Ramsar Convention
  - Montreal Protocol
  - Cartagena Protocol
45. Which among the following is India's first state to release a Climate Change Action Plan?
- Himachal Pradesh
  - Delhi
  - Haryana
  - Kerala
46. In context of environment, the term "dirty dozen" refers to
- 12 most harmful greenhouse gases
  - 12 ozone depleting substances
  - 12 persistent organic pollutants
  - 12 acid rain substances
47. \_\_\_\_\_ is caused by careless handling of instruments.
- Systematic Error
  - Random Error
  - Gross Error
  - Fine Error
48. Which of these International agreements was adopted with the objective to ensure access to genetic resources and fair and equitable sharing of benefits arising from their use?
- Cartagena Protocol 2000
  - Nagoya Protocol 2010
  - Paris Agreement 2015
  - Rio Declaration 1992
49. What is the oxidation number of Cr atom in  $K_3CrO_8$ ?
- +2
  - +3.5
  - +5
  - 5.3
50. For which of the following reaction  $\Delta H = \Delta U$ ?
- $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$
  - $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$
  - $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$
  - $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$

51. For an ideal gas at 300K

a)  $\left(\frac{\partial U}{\partial V}\right)_T = 0$

b)  $\left(\frac{\partial U}{\partial T}\right)_V = 0$

c)  $\left(\frac{\partial H}{\partial T}\right)_P = 0$

d)  $\left(\frac{\partial G}{\partial T}\right)_P = 0$

52. Which of the following is an example of a polymer used in 3D printing?

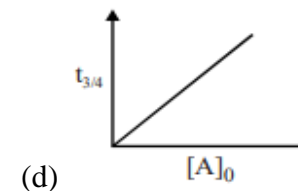
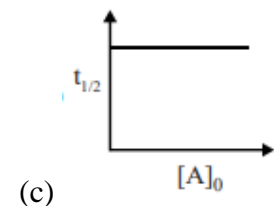
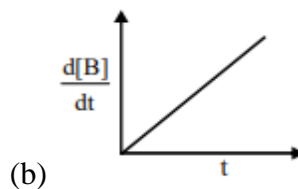
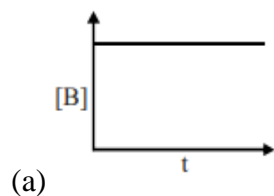
a) Polylactic acid

b) Bakelite

c) Polyurethane

d) Polyethylene terephthalate

53. Which graph represents zero order reaction  $[A(g) \rightarrow B(g)]$



54. The change in entropy for a reversible adiabatic process is

a) Maximum

b) Minimum

c) zero

d) positive

55. Match the metal given in Column-A with its medicinal use as a compound in Column-B

Column-A	Column-B
(A) Gd	(I) Cancer
(B) Au	(II) Maniac depression
(C) Pt	(III) MRI contrast agent
(D) Li	(IV) Arthritis

Correct match is

a) A-II; B-III; C-IV; D-I

b) A-III; B-IV; C-I; D-II

c) A-IV; B-II; C-I, D-III

d) A-I; B-II; C-III; D-IV

56. In which chromatography stationary phase is more polar than mobile phase?
- a) Normal phase chromatography
  - b) Gas chromatography
  - c) Size exclusion chromatography
  - d) Liquid chromatography
57. In common glass electrode, alkaline error caused at  $\text{pH} > 10$  is least for
- a) 0.01M NaCl
  - b) 1.0M NaCl
  - c) 1.0M LiCl
  - d) 1.0M KCl
58. When the intensity of absorption maximum  $E_{\text{max}}$  increases on certain modifications in an organic compound the effect is called
- a) Hypochromic Effect
  - b) Hypsochromic Shift
  - c) Hyperchromic shift
  - d) Chemical Shift
59. Which one of the following statement is false for IR spectroscopy
- a) A conjugation decreases the C=O stretching frequency
  - b) Higher the frequency if more strained the acyclic ring containing C=O group
  - c) Electron releasing substituents decrease the frequency of C=O bond
  - d) Electron withdrawing substituents decrease the frequency of C=O bond
60. Which one of the following is C≡C stretching for internal alkyne?
- a) 790-840  $\text{cm}^{-1}$
  - b) 910-990  $\text{cm}^{-1}$
  - c) 2100-2250  $\text{cm}^{-1}$
  - d) 3200-3250  $\text{cm}^{-1}$
61. How much fly ash must thermal power plants that burn coal and lignite use in accordance with recent changes to the Environmental Protection Act?
- a) 50%
  - b) 33%
  - c) 100%
  - d) 5%
62. Which state's famous 'Living Root Bridge' Cultural Landscapes have been tentatively added to the list of UNESCO World Heritage Sites?
- a) Meghalaya
  - b) Karnataka
  - c) Jammu & Kashmir
  - d) Sikkim
63. A geostationary satellite appears stationary relative to the earth. Such a satellite appears stationary due to its zero relative velocity with respect to a place on earth. The distance of a geostationary satellite from the centre of earth with radius R, is
- a) 5R
  - b) 6.6R
  - c) 8.2R
  - d) 7.4R

64. Venus is the second planet from the Sun. Venus is a terrestrial planet and is sometimes called Earth's "sister planet" because of their similar size, mass, proximity to the Sun, and bulk composition. Which gas dominates the atmosphere of Venus?
- nitrogen
  - oxygen
  - carbon dioxide
  - Ozone
65. A software that hijacks your computer and asks you to pay, in order to get removed
- Key logging
  - Trojan
  - Encrypting malware
  - Ransomware
66. The phenomenon on which Optical fiber works is
- Diffraction
  - Scattering
  - Refraction
  - Total internal reflection
67. Which of the following does not belong to Amritsar?
- Ram Tirath
  - Gobindgarh Fort
  - Patalpuri Sarovar
  - Ramgarhia Fort
68. Who wrote the Punjabi novel *Eho Hamara Jeevna*?
- Amrita Pritam
  - Kartar Singh Duggal
  - Dalip Kaur Tiwana
  - Gurdial Singh
69. If a radioactive material has a half-life of 1 year, then its mass reduces to 6.25% in
- 1/2 years
  - 2 years
  - 3 years
  - 4 years
70. Mobile Autonomous Launcher (MAL) is
- A state -of- the -art Land Based Weapon Complex
  - It consists of three missiles in ready to launch configuration housed in containers
  - Radar receivers for target information and ultra-advanced Fire Control System for coordinating the launch
  - All of the above

71. Which of the following institute has partnered with Ministry of Earth Sciences' India Meteorological Department (IMD) to develop climate solutions for stakeholders at the village, city, and district levels?

- a) Indian Institute of Technology, Bombay
- b) Indian Institute of Technology, Kharakpur
- c) Indian Institute of Technology, Madras
- d) Indian Institute of Technology, Pune

72. Which Biosphere reserve in India became the 11<sup>th</sup> one to be included in the World Network of Biosphere Reserves?

- a) Nanda Devi
- b) Dibru-Saikhowa
- c) Khangchendzonga
- d) Dehang Debang

73. Which among the following contribute to the deposition of sediments in the ocean?

- 1) Volcanic eruption
- 2) Erosion and Deposition
- 3) Decay and decomposition of marine organisms

Which of the above statements is/are correct?

- a) 1 only
- b) 2 only
- c) 3 only
- d) 1, 2, and 3

74. The accounts of which of the following are not audited by CAG?

- a) Municipal institutions
- b) State Governments
- c) Government Companies
- d) Central Government

75. Which of the following is a compilation on physics and astronomy, translated from Sanskrit to Persian:

- a) Dala'il-i Firuz Shahi
- b) Kitab fi tahqiq ma li'l-Hind
- c) Ghurra al-kamal
- d) Muhaqqiq-i Hindi

76. Akbar invented a special kind of hunting sport named

- a) Shikar
- b) Safra
- c) Shikast
- d) Qamargha

77. The economic policy of the British in India was to

- a) Industrialize India
- b) Bring India to the level of western countries
- c) Promote the material prosperity of the Indians
- d) Convert India into an agrarian satellite of the metropolitan capitalism

78. Ibn Batuta visited India during the reign of
- Razia
  - Aramshah
  - Muhammed bin Tughluq
  - Feroz shah Tughluq
79. Which Governor General introduced postage stamps in India?
- Lord Wellesley
  - Lord William Benting
  - Lord Dalhousie
  - Lord Mountbatten
80. Which of the following class of people did not show their support to the Mutiny?
- The Indian Royals
  - Peasants and Artisans
  - Land Aristocracy and Zamindars
  - The new middle class
81. In which of the following Ashoka's inscription, the description of Kalinga's war genocide is present?
- Rock Edict X
  - Rock Edit XII
  - Rock Edit XIII
  - Rock Edit XIV
82. Which Indian was the pioneer of science of Metrics?
- Pururva
  - Pingal
  - Nighantu
  - Nichiketa
83. Consider the following statements regarding PALM 400 Drones.
- 1) The PALM 400 – acronym for 'Precision Attack Loitering Munition' is a a long-range, high-precision loitering munition system.
  - 2) It is the result of joint venture between Flytrex Systems (Israel), UVision Air Ltd, and Birla Precitech Private Ltd (BPPL)
  - 3) It can be discharged from a canister and fly 3000-4000 feet above a kill zone for up to 120 minutes.
  - 4) It has a range of more than 100 km and travels at a speed of 50 to 140 knots (90 to 260 km/h).
- Which of the above statements are correct? Choose the correct option.
- 1 and 4 only
  - 1, 2 and 3 only
  - 1, 3 and 4 only
  - 1, 2, 3 and 4

84. Consider the following statements regarding *Bharat 6G Vision Document*.
- 1) The document was prepared by the STG Group under the Department of Science & Technology, Government of India.
  - 2) India's 6G mission will be in two phases: the first one from 2023 to 2025 and the second one from 2025 to 2030.
  - 3) During Phase 1 Support will be provided to explorative ideas, risky pathways and proof-of-concept tests.
  - 4) During Phase 2, the focus will be on commercialization of the ideas and concepts.
- Which of the above statements are correct? Choose the correct option.
- a) 1, 2 and 3 only
  - b) 1, 2 and 4 only
  - c) 2, 3 and 4 only
  - d) 1, 2, 3 and 4
85. National Institute of Disaster management headquarter is located at
- a) Dehradun
  - b) Kolkata
  - c) Chennai
  - d) New Delhi
86. A ring of narrow growing corals animals of horseshoe shape and crowned with palm trees is called
- a) Algae ridge
  - b) Atoll
  - c) Patch reef
  - d) Coral pinnacle
87. Which one is correct sequence of countries, in decreasing order, in respect of per-capita CO<sub>2</sub> emission?
- a) USA-China-Canada
  - b) USA-China-Japan
  - c) USA-China-Germany
  - d) USA-Canada-Japan
88. Consider the following sources of the Indian Constitution.
- (1) Directive Principle of State Policy- Irish Constitution
  - (2) Advisory Jurisdiction of the Supreme Court- Canadian Constitution
  - (3) Concurrent List –US Constitution
  - (4) Parliamentary Privileges- British Constitution
- Which of the following is the correct option?
- a) 1, 2 and 4
  - b) 2, 3 and 4
  - c) 1, 3 and 4
  - d) 1, 2 and 3

89. By which Constitutional Amendment Bihar became free from the obligation of having a tribal welfare minister in the state council of ministers?
- 84 th Constitutional Amendment
  - 94 th Constitutional Amendment
  - 104 th Constitutional Amendment
  - 74 th Constitutional Amendment
90. Which of the following country has joined NATO in April 2023?
- Denmark
  - Belgium
  - Poland
  - Finland
91. Which of the following countries will host the 15<sup>th</sup> BRICS summit?
- Brazil
  - South Africa
  - China
  - Russia
92. India's largest Nuclear Power Plant is located in which of the following state?
- Tamil Nadu
  - Maharashtra
  - Uttar Pradesh
  - Karnataka
93. The Election Commission recently has launched a year long voter awareness program on All India Radio. What is the name of this program?
- Voter junction
  - Radio Junction
  - Election Junction
  - Matadata Junction
94. In which of the following cities the National Climate Conclave 2023 was held?
- Hyderabad
  - Lucknow
  - New Delhi
  - Ranchi



95. With reference to the Indian Science Congress ( ISC), which of the following statements is/are correct?

1. 108<sup>th</sup> convention of ISC was held at RTM, Nagpur University
2. It's theme was " science and Technology for every Nation"
3. Convention was held in January 2023

Select the correct answer using the code given below

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1,2 and 3

96. Name the scheme launched by the Ministry of Social Justice and Empowerment for the welfare of the Transgender Community and the beggars?

- a) SMILE
- b) WINNER
- c) PROUD
- d) SPARK

97. The Sixth Edition of the Indian Ocean Conference took place at

- a) New Delhi
- b) Dhaka
- c) Beijing
- d) Naypyidaw

98. Which was the last state of the Kangra group losing its independence to the Sikhs?

- a) Kulehar
- b) Guler
- c) Dattapur
- d) Kullu

99. Among which of the regional and sub-regional groups both India and Nepal are not members?

- a) SAARC
- b) BIMSTEC
- c) BBIN
- d) ASEAN

100. Which of the following country has won the ICC Women's World Cup 2022 title?

- a) New Zealand
- b) Australia
- c) England
- d) West Indies

Find the wrong number in following number series:

101. 5, 6, 14, 45, 184, 920, 5556

- a) 5
- b) 6
- c) 14
- d) 920

102. In a certain shop, notebooks that normally sell for Rs. 9 each are on sale at 2 for Rs. 15. How much can be saved by purchasing 10 of these notebooks at the sale price?

- a) Rs.9
- b) Rs.10
- c) Rs.15
- d) Rs.19

103. 6 men take 9 days to complete a piece of work by working for 12 hours a day. Speed of one man is equal to that of 4 children. If the work is to be completed only by children with help of 2 men in 6 days by working for 6 hours a day, then how many children's are required?

- a) 56
- b) 44
- c) 42
- d) 64

104. A boatman goes 8 km against the current of the stream in 2 hour and goes 6 km along the current in 30 minutes. How long will it take to go 12 km in stationary water?

- a) 2 hr 15 min
- b) 1 hr 45 min
- c) 1 hr 30 min
- d) 2 hr

105. On 6<sup>th</sup> Dec, 2007 Thursday falls. What day of the week was it on 9<sup>th</sup> March, 2008?

- a) Saturday
- b) Sunday
- c) Monday
- d) Tuesday

106. The salary of a person was reduced by 5% .By what percent should his reduced salary be raised so as to bring it at par with his original salary?

- a) 7.15%
- b) 9.05%
- c) 6.75%
- d) 5.26%

107. In a room of 40 people what is the probability that at least two people have the same birthday?
- 41.1 %
  - 89.1%
  - 11.7%
  - 2.7%
108. A man has 250 gold coins. He wishes to distribute them into bags such that he can pay any sum from 1 to 250 by handing over some bags. What is the minimum number of bags required?
- 8
  - 9
  - 10
  - 7
109. B is the only son of A who is the only daughter of C. E is the mother of F and daughter-in-law of A. How is F related to C?
- Grand Daughter
  - Grandson
  - Grand Grand Daughter
  - Cannot be determined
110. If DELHI is coded as EGOLN, then how is BANGALORE coded in same language?
- CBQKDFRVN
  - CWDPRVKVN
  - CBMHBMQSF
  - CCQKFRVZN
111. 'ਅਨੋਖਾ' ਸ਼ਬਦ ਦੇ ਸਮਾਨਾਰਥਕ ਸ਼ਬਦਾਂ ਦਾ ਸਹੀ ਜੁੱਟ ਚੁਣੋ:
- ਅਸਚਰਜ, ਅਦਭੁੱਤ, ਖਰਾਬ
  - ਅਨੁਪਮ, ਅਦਭੁੱਤ, ਵਚਿੱਤਰ
  - ਵਚਿੱਤਰ, ਬੁਰਾ, ਅਦਭੁੱਤ
  - ਅਦਭੁੱਤ, ਅਲੌਕਿਕ, p/ fw; kb
112. 'ਇੱਕ ਸੱਪ ਦੂਜਾ ਉੱਡਣਾ' ਕਿਸ ਸੰਦਰਭ ਵਿੱਚ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ:
- ਕਰਤਬ ਕਰਨ ਵਾਲਾ ਸੱਪ
  - ਖੰਬਾਂ ਵਾਲਾ ਸੱਪ
  - ਖਤਰਾ ਮੋਲ ਲੈਣਾ
  - ਬਹੁਤ ਖਤਰਨਾਕ ਹੋਣਾ

113. ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ ਦਾ ਸਹੀ ਜੋੜਾ ਚੁਣੋ:

- a) ਕਟੜ/ਕਟੜ
- b) ਪਿੰਡ/ਪਿੰਡ
- c) ਓਪਾਏ/ਉਪਾਯ
- d) ਸੰਘ/ਸੰਘ

114. 'ਝਗੜਾਲੂ' ਵਿੱਚ ਵਰਤਿਆ ਪਿਛੇਤਰ ਹੈ:

- a) ਆਲੂ
- b) ਝਾਲੂ
- c) ਅਲ
- d) ਲੂ

115. ਸਹੀ ਜੁੱਟ ਦੱਸੋ:

- a) ਗੱਭਰੂ/ਤੀਵੀਂ
- b) ਸਾਲਾ/ਸਾਲਣੀ
- c) ਉੱਲੂ/ਬਤੌਰੀ
- d) ਨਵਾਬ/ਮਲਕਾ

116. 56 ਨੂੰ ਪੰਜਾਬੀ ਵਿੱਚ ..... ਕਹਿੰਦੇ ਹਨ:

- a) ਛੱਪੰਨ
- b) ਛਪੰਜੀ
- c) ਛਪੰਝਾ
- d) ਛਪੰਜਾ

117. ਪੰਜਾਬ ਵਿੱਚ ਕਿਹੜੇ ਪੰਜ ਦਰਿਆ ਵਗਦੇ ਸਨ:

- a) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- b) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ
- c) ਸਰਸਵਤੀ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- d) ਸਤਲੁਜ, ਘੱਗਰ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ

118. jgrwvW dI rOSnI dw mylw iks mhIny ivc l`gdw hY?

- a) BwdoN
- b) cyq
- c) P`gx
- d) jyT

119. “ਉੱਠੋ ਤਾਂ ਉੱਠ ਨਹੀਂ.....”।

a) ਸੁਤਕ ਰਹਿ

b) ਨੀਂਦ ਦਕ ਮਜਕ ਲੁੱਟ

c) ਠੂਠਕ ਫੁਟ

d) ਰੇਤੇ ਦਹ ਮੁੱਠ

120. ‘ਟਕਇਮ ਬਕਉਂਡ’ ਦਕ ਸੁੱਧ ਪੰਜਕਬਹ ਰੂਪ ਲਿਖੋ -

a) ਮਿਤਹ-ਬੱਧ

b) ਸਮਾਂ-ਸੂਚਕ

c) ਮਿਤਹ ਤੋਂ

d) ਤਕਰਹਖ

\*\*\*\*\*

# **SPACE FOR ROUGH WORK**

# PUNJAB PUBLIC SERVICE COMMISSION

Objective Type Test (May-2023) for Recruitment to the Post of Assistant Scientific Officer (Group A) in the Department of Science, Technology and Environment, Govt. of Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Total Questions: 120

Time Allowed: 2 Hours

Candidate's Name \_\_\_\_\_

Father's Name \_\_\_\_\_

Date of Birth          
DD MM YYYY

OMR Response Sheet No. \_\_\_\_\_

Roll No. \_\_\_\_\_

Candidate's Signature (Please sign in the box)

Question  
Booklet Set

**B**

Booklet Series

## INSTRUCTIONS

1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant boxes out of 1 to 9 of the Optical Mark Reader (OMR) response sheet, supplied separately.
2. Use only blue or black **ball point pen** to fill the relevant columns on this page as well as in OMR sheet. Use of Ink pen or any other pen is not allowed.
3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible or incomplete.
4. Each candidate is required to attempt 120 questions in 120 minutes, except for orthopedically/visually impaired candidates, who would be given 40 extra minutes, for marking correct responses on the OMR sheet.
5. The question paper booklet has 22 pages.
6. The candidates, when allowed to open the question paper booklet, must first check the entire booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should IMMEDIATELY bring this fact to the notice of the Invigilation Staff and obtain a new booklet of the same series as given earlier.
7. The serial number of the new Question booklet if issued for some reason should be entered in the relevant column of the OMR. The Invigilation Staff must make necessary corrections in their record regarding the change in the serial no. of Question booklet.
8. The paper consists of total 480 Marks. Each question shall carry 4 marks. There are four options for each question and the candidate has to mark the MOST APPROPRIATE answer on the OMR response sheet.
9. There is negative marking (1 mark for each question) for questions wrongly answered by the candidate.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidate **MUST READ INSTRUCTIONS BEHIND THE OMR SHEET** before answering the questions and check that two carbon copies attached to the OMR sheet are intact.

1. 'ਅਨੋਖਾ' ਸ਼ਬਦ ਦੇ ਸਮਾਨਾਰਥਕ ਸ਼ਬਦਾਂ ਦਾ ਸਹੀ ਜੁੱਟ ਚੁਣੋ:
  - a) ਅਸਚਰਜ, ਅਦਭੁੱਤ, ਖਰਾਬ
  - b) ਅਨੁਪਮ, ਅਦਭੁੱਤ, ਵਚਿੱਤਰ
  - c) ਵਚਿੱਤਰ, ਬੁਰਾ, ਅਦਭੁੱਤ
  - d) ਅਦਭੁੱਤ, ਅਲੌਕਿਕ, p/ fw; kb
  
2. 'ਇੱਕ ਸੱਪ ਦੂਜਾ ਉੱਡਣਾ' ਕਿਸ ਸੰਦਰਭ ਵਿੱਚ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ:
  - a) ਕਰਤਬ ਕਰਨ ਵਾਲਾ ਸੱਪ
  - b) ਖੰਬਾਂ ਵਾਲਾ ਸੱਪ
  - c) ਖਤਰਾ ਮੋਲ ਲੈਣਾ
  - d) ਬਹੁਤ ਖਤਰਨਾਕ ਹੋਣਾ
  
3. ਸੁੱਧ-ਅਸੁੱਧ ਦਾ ਸਹੀ ਜੋੜਾ ਚੁਣੋ:
  - a) ਕਟੜ/ਕਟੜ
  - b) ਪਿੰਡ/ਪਿੰਡ
  - c) ਓਪਾਏ/ਉਪਾਯ
  - d) ਸੰਘ/ਸੰਘ
  
4. 'ਝਗੜਾਲੂ' ਵਿੱਚ ਵਰਤਿਆ ਪਿਛੇਤਰ ਹੈ:
  - a) ਆਲੂ
  - b) ਝਾਲੂ
  - c) ਅਲ
  - d) ਲੂ
  
5. ਸਹੀ ਜੁੱਟ ਦੱਸੋ:
  - a) ਗੱਭਰੂ/ਤੀਵੀਂ
  - b) ਸਾਲਾ/ਸਾਲਣੀ
  - c) ਉੱਲੂ/ਬਤੌਰੀ
  - d) ਨਵਾਬ/ਮਲਕਾ
  
6. 56 ਨੂੰ ਪੰਜਾਬੀ ਵਿੱਚ ..... ਕਹਿੰਦੇ ਹਨ:
  - a) ਛੱਪੰਨ
  - b) ਛਪੰਜੀ
  - c) ਛਪੰਝਾ
  - d) ਛਪੰਜਾ



7. ਪੰਜਾਬ ਵਿੱਚ ਕਿਹੜੇ ਪੰਜ ਦਰਿਆ ਵਗਦੇ ਸਨ:

- a) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- b) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ
- c) ਸਰਸਵਤੀ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- d) ਸਤਲੁਜ, ਘੱਗਰ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ

8. jgrvwW dI rOSnI dw mylw iks mhIny ivc l`gdw hY?

- a) BwdoN
- b) cyq
- c) P`gx
- d) jyT

9. “ਉੱਠੋ ਤਾਂ ਉੱਠ ਨਹੀਂ.....”।

- a) ਸੁਤਕ ਰਹਿ
- b) ਨੀਂਦ ਦਕ ਮਜਕ ਲੁੱਟ
- c) ਠੂਠਕ ਫੁਟ
- d) ਰੇਤੇ ਦਹ ਮੁੱਠ

10. ‘ਟਕਇਮ ਬਕਉਂਡ’ ਦਕ ਸੁੱਧ ਪੰਜਕਬਹ ਰੂਪ ਲਿਖੋ -

- a) ਮਿਤਹ-ਬੱਧ
- b) ਸਮਾਂ-ਸੂਚਕ
- c) ਮਿਤਹ ਤੋਂ
- d) ਤਕਰਹਖ

11. The general conditions for using “Autoclave” during sterilization of samples in a microbiology laboratory are

- a) Temperature = 121 °C, Pressure = 15 psi
- b) Temperature = 15 °C, Pressure = 121 psi
- c) Temperature = 100 °C, Pressure = 10 psi
- d) Temperature = 121 °C, Pressure = 25 psi

12. During microbial growth, the phase during which microbes are adapted to the environment is called

- a) Exponential Phase
- b) Log Phase
- c) Lag Phase
- d) Stationary Phase

13. Among the following, Fecal indicator bacteria is

- a) *Pseudomonas aeruginosa*
- b) *Bacillus subtilis*
- c) *Salmonella typhi*
- d) *Escherichia coli*

14. Agar-agar used in microbiology laboratory is mainly obtained by
- Golden algae
  - Red algae
  - Yeast
  - Cyanobacteria
15. The poisoning of central nervous system with organic mercurial is known as
- Minamata disease
  - Methamoglobinemia
  - Both of the above
  - None of the above
16. Identify the incorrect statement about carbon isotopes
- C-13 is less abundant in vegetation than in ocean
  - C-12 is most abundant in nature
  - C-14 is absent in fossil fuel
  - C-13 is used for carbon –dating
17. Corona-virus structure is composed of
- outer protein coat and central core of nucleic acid
  - outer nucleic acid and proteinous central core
  - outer proteinous coat and central DNA core
  - outer proteinous coat and central RNA
18. Whenever there is high BOD, DO is less so much that fish cannot survive in lake water because
- Fish utilize all Oxygen
  - Bacteria utilize all Oxygen
  - Algae utilize all oxygen
  - Biological compound are toxic to fish
19. Arsenic problem in India is primarily due to
- Over exploitation of Arsenopyrite in the hinterland
  - Over exploitation of coal in Bihar and West Bengal
  - Over exploitation of groundwater in affected areas
  - Over exploitation of surface water in the affected area
20. When the industry with 'Red' Category is to be established, it is necessary to have a public hearing or inquiry under the procedure called as
- Environmental Health Hazard (EHH)
  - Environmental Litigation (EL)
  - Environmental Management Systems (EMS)
  - Environmental Impact Assessment (EIA)

21. The bacteria responsible for deposition of iron oxide in water pipes is
- Gallionella*
  - Klebsiella*
  - Thermococcus*
  - Helicobacter*
22. Which of the following is true?
- Benzene hexachloride is a non biodegradable pollutant
  - Carbon dioxide is a primary air pollutant
  - Sulphur dioxide causes brown air effect during traffic congestion in cities
  - Anthropogenic air pollutants are natural in origin
- i and ii only
  - ii and iii only
  - i and iv only
  - iii and i only
23. Severe drought is declared if
- Deficit of rainfall is more than 50 percent of the normal
  - Deficit of rainfall varies between 25- 45 percent of the normal
  - Rainfall deficit exceeds 25 percent of the normal
  - Rainfall deficit is between 15 -25 percent
24. C<sub>4</sub> plants are commonly found in
- Humid and low temperature environment
  - Arid and hot environment
  - Temperate environment
  - Semi-humid environment
25. Recently implemented UN Sustainable Development Goal (SDG) has how many goals to achieve by 2030?
- 10
  - 17
  - 30
  - None of the above
26. According to IPCC, during the 20<sup>th</sup> century earth's mean surface temperature has risen by approximately
- 0.4°C
  - 0.6°C
  - 0.8°C
  - 1.0°C

27. Green Climate Fund (GCF) is established to limit or reduce emission in
- Developing countries
  - NATO member countries
  - Ukraine war effected areas
  - Developed countries
28. The Polluter pay principle was first conceptualized by the
- G 20 countries
  - OECD countries
  - European countries
  - America
29. Which gas is produced from the guts of cattle that is a major greenhouse gas?
- CO<sub>2</sub>
  - CFC
  - Halons
  - Methane
30. Ozone depletion in the Stratosphere may not create which of the following problem in human being?
- Liver disease
  - Anemia
  - Eye Cataracts
  - Skin Cancer
31. Montreal Protocol is a multilateral environmental agreement related to control the Ozone layer depletion was adopted in which year ?
- 1992
  - 1987
  - 1999
  - 2006
32. A current news articles writes “Climate change making Earth uninhabitable...” Guterres warns. Who is Antonio Guterres ?
- Environment Minister of South Africa
  - UN Secretary- General
  - Canadian Environment minister
  - Famous Nobel recipient on Environment
33. “Where there is a risk of severe damage to the environment but absence of any scientific or conclusive proof for the reason , we must stop that activity being safe than sorry”, was given in Rio Declaration of 1992. This is related to
- Green Wash
  - Deep Ecology
  - Precautionary principle
  - Blue risk principle

34. In the Paris Agreement of Climate change, India has taken its pledge that it will reduce the emission intensity of its GDP by 2030 at level of
- 45%
  - 30%
  - 25%
  - 19%
35. Which article of the Indian constitution directs that the State shall endeavour to Protect and improve the environment and to safeguard the forest and wildlife of the country
- 51 A
  - 12 B
  - 48A
  - 8A
36. A developmental project requires both environmental clearance as well as approval under
- Water act, 1974
  - Forest Conservation Act,1980
  - National Environmental Tribunal Act,1995
  - Air Act, 1981
37. According to Environment (Protection) Act,1986 permissible limits of oil and grease in the effluents to be discharged into public sewers is
- 10 mg/ l
  - 20 mg / l
  - 25 mg/ l
  - 30 mg/ l
38. The title of the Brundtland report is
- Caring for Earth
  - Caring of Biosphere
  - Our common Future
  - The Silent space
39. Under the Air Act 1981, which body is empowered to set standard for ambient air quality?
- MoEF &CC
  - State Pollution Control Board
  - Central Pollution Control Board
  - Ministry of Road Transport
40. Access Benefit Sharing (ABS) is an important component in the Environmental legislation of
- FCA 1980
  - Water Act,1974
  - Environment (Protection ) Act 1986
  - Biodiversity Act,2002

41. The Project Snow leopard, was launched in India to safeguard and conserve the high altitude habitat for the animal in the year
- 2015
  - 2005
  - 2011
  - 2009
42. What is the key difference between the Forest (conservation) Act 1980 and Indian Forest Act 1927?
- The Forest (conservation) Act 1980, came in to force to address deforestation, whereas Indian Forest Act 1927 was geared to allow the colonial British administration to control extraction of timber.
  - Tribal people were given more rights in Forest conservation Act,1980 but in IFA,1927 has no power to tribals stay around forest.
  - FCA,1980 focused more of wildlife protection but IFR,1927 was more of Timber protection
  - No one is correct
43. In a frequency distribution, the median and mean is 15 and 12 respectively, find the mode.
- 11
  - 21
  - 41
  - 45
44. What is the difference between Type I and Type II errors in statistical hypothesis testing?
- Type I error occurs when we reject a null hypothesis that is true, while Type II error occurs when we accept a null hypothesis that is false.
  - Type I error occurs when we accept a null hypothesis that is false, while Type II error occurs when we reject a null hypothesis that is true.
  - Type I error occurs when we reject a null hypothesis that is false, while Type II error occurs when we accept a null hypothesis that is true.
  - Type I error occurs when we accept a null hypothesis that is true, while Type II error occurs when we reject a null hypothesis that is false.
45. If the standard deviation of a data is 0.012. Find the variance.
- 0.144
  - 0.00144
  - 0.000144
  - 0.0000144

46. Consider the following unclassified frequency distribution

X:	Frequency
1	8
2	10
3	11
4	16
5	20
6	25
7	15
8	9
9	6

The median of the above given unclassified frequency distribution is

- a) 1
- b) 2
- c) 5
- d) 7

47. If  $y^2 = 4x$  and 0.1% error is incurred for  $y$ , the percentage error involved in  $x$  will be

- a) 0.4
- b) 0.025
- c) 0.1
- d) 0.05

48. In which of the following activities silicon carbide is used?

- a) Making cement and glass
- b) Disinfecting pond water
- c) Making casts for statues
- d) Cutting very hard substances

49. *Lantana camara*— know as Phool Lakhri in local parlance is a shrub found in abundance in Himachal Pradesh. Which of the following statements are correct about it?

1. It is a toxic weed and has affected the mountain diversity of the state.
2. *Lantana* species are widely cultivated for their flowers.
3. It is endemic to India.
4. It is considered as potential fire hazard and it is combustible even when green.

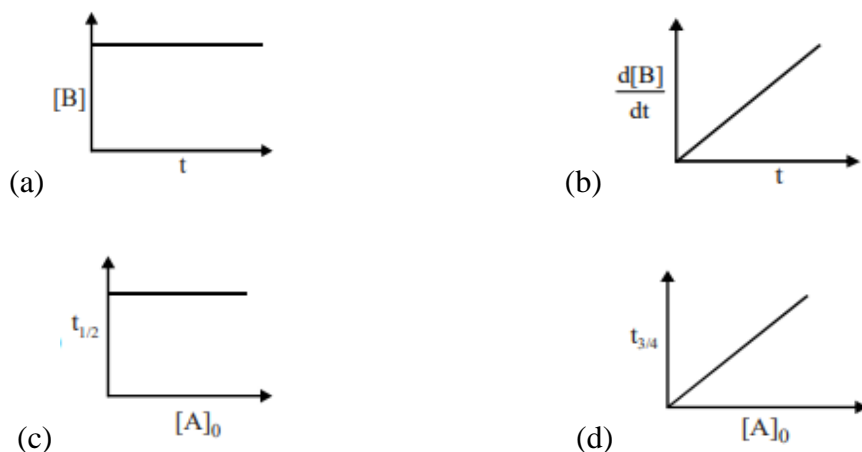
- a) 1 & 3 only
- b) 2 & 4 only
- c) 1, 2 & 4 only
- d) 1, 2, 3 and 4

50. Which article of the CBD states that, “*as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species*”.
- Article 8(d)
  - Article 8(h)
  - Article 9(d)
  - Article 9(h)
51. Which one of the following is not a bio-indicator of water pollution?
- Blood-worms
  - Sludge-worms
  - Sewage fungus
  - Stone flies
52. The accumulation of partially decayed vegetation or organic matter in wet areas results in the formation of
- Moss
  - Peat
  - Coal
  - Fossils
53. Relative contributions of CO<sub>2</sub>, CH<sub>4</sub>, CFCs and N<sub>2</sub>O towards global warming are:
- 50 %, 30 %, 10 % , and 10 % respectively
  - 60%, 20%, 14%, and 6% respectively
  - 40 %, 30%, 20% and 10% respectively
  - 35 %, 15%, 10% and 5% respectively
54. Which one of the following treaty is related to the control of trans-boundary movements of hazardous wastes and their disposal?
- Basel Convention
  - Ramsar Convention
  - Montreal Protocol
  - Cartagena Protocol
55. Which among the following is India’s first state to release a Climate Change Action Plan?
- Himachal Pradesh
  - Delhi
  - Haryana
  - Kerala
56. In context of environment, the term “dirty dozen” refers to
- 12 most harmful greenhouse gases
  - 12 ozone depleting substances
  - 12 persistent organic pollutants
  - 12 acid rain substances



57. \_\_\_\_\_ is caused by careless handling of instruments.
- Systematic Error
  - Random Error
  - Gross Error
  - Fine Error
58. Which of these International agreements was adopted with the objective to ensure access to genetic resources and fair and equitable sharing of benefits arising from their use?
- Cartagena Protocol 2000
  - Nagoya Protocol 2010
  - Paris Agreement 2015
  - Rio Declaration 1992
59. What is the oxidation number of Cr atom in  $K_3CrO_8$ ?
- +2
  - +3.5
  - +5
  - 5.3
60. For which of the following reaction  $\Delta H = \Delta U$ ?
- $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$
  - $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$
  - $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$
  - $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$
61. For an ideal gas at 300K
- $(\frac{\partial U}{\partial V})_T = 0$
  - $(\frac{\partial U}{\partial T})_V = 0$
  - $(\frac{\partial H}{\partial T})_P = 0$
  - $(\frac{\partial G}{\partial T})_P = 0$
62. Which of the following is an example of a polymer used in 3D printing?
- Polylactic acid
  - Bakelite
  - Polyurethane
  - Polyethylene terephthalate

63. Which graph represents zero order reaction  $[A(g) \rightarrow B(g)]$



64. The change in entropy for a reversible adiabatic process is

- a) Maximum                      b) Minimum  
c) zero                              d) positive

65. Match the metal given in Column-A with its medicinal use as a compound in Column-B

Column-A	Column-B
(A) Gd	(I) Cancer
(B) Au	(II) Maniac depression
(C) Pt	(III) MRI contrast agent
(D) Li	(IV) Arthritis

Correct match is

- a) A-II; B-III; C-IV; D-I                      b) A-III; B-IV; C-I; D-II  
c) A-IV; B-II; C-I, D-III                      d) A-I; B-II; C-III; D-IV

66. In which chromatography stationary phase is more polar than mobile phase?

- a) Normal phase chromatography              b) Gas chromatography  
c) Size exclusion chromatography              d) Liquid chromatography

67. In common glass electrode, alkaline error caused at  $\text{pH} > 10$  is least for

- a) 0.01M NaCl                                      b) 1.0M NaCl  
c) 1.0M LiCl                                        d) 1.0M KCl

68. When the intensity of absorption maximum  $E_{\max}$  increases on certain modifications in an organic compound the effect is called
- a) Hypochromic Effect
  - b) Hypsochromic Shift
  - c) Hyperchromic shift
  - d) Chemical Shift
69. Which one of the following statement is false for IR spectroscopy
- a) A conjugation decreases the C=O stretching frequency
  - b) Higher the frequency if more strained the acyclic ring containing C=O group
  - c) Electron releasing substituents decrease the frequency of C=O bond
  - d) Electron withdrawing substituents decrease the frequency of C=O bond
70. Which one of the following is C≡C stretching for internal alkyne?
- a) 790-840  $\text{cm}^{-1}$
  - b) 910-990  $\text{cm}^{-1}$
  - c) 2100-2250  $\text{cm}^{-1}$
  - d) 3200-3250  $\text{cm}^{-1}$
71. How much fly ash must thermal power plants that burn coal and lignite use in accordance with recent changes to the Environmental Protection Act?
- a) 50%
  - b) 33%
  - c) 100%
  - d) 5%
72. Which state's famous 'Living Root Bridge' Cultural Landscapes have been tentatively added to the list of UNESCO World Heritage Sites?
- a) Meghalaya
  - b) Karnataka
  - c) Jammu & Kashmir
  - d) Sikkim
73. A geostationary satellite appears stationary relative to the earth. Such a satellite appears stationary due to its zero relative velocity with respect to a place on earth. The distance of a geostationary satellite from the centre of earth with radius R, is
- a) 5R
  - b) 6.6R
  - c) 8.2R
  - d) 7.4R
74. Venus is the second planet from the Sun. Venus is a terrestrial planet and is sometimes called Earth's "sister planet" because of their similar size, mass, proximity to the Sun, and bulk composition. Which gas dominates the atmosphere of Venus?
- a) nitrogen
  - b) oxygen
  - c) carbon dioxide
  - d) Ozone

75. A software that hijacks your computer and asks you to pay, in order to get removed
- Key logging
  - Trojan
  - Encrypting malware
  - Ransomware
76. The phenomenon on which Optical fiber works is
- Diffraction
  - Scattering
  - Refraction
  - Total internal reflection
77. Which of the following does not belong to Amritsar?
- Ram Tirath
  - Gobindgarh Fort
  - Patalpuri Sarovar
  - Ramgarhia Fort
78. Who wrote the Punjabi novel *Eho Hamara Jeevna*?
- Amrita Pritam
  - Kartar Singh Duggal
  - Dalip Kaur Tiwana
  - Gurdial Singh
79. If a radioactive material has a half-life of 1 year, then its mass reduces to 6.25% in
- 1/2 years
  - 2 years
  - 3 years
  - 4 years
80. Mobile Autonomous Launcher (MAL) is
- A state -of- the -art Land Based Weapon Complex
  - It consists of three missiles in ready to launch configuration housed in containers
  - Radar receivers for target information and ultra-advanced Fire Control System for coordinating the launch
  - All of the above
81. Which of the following institute has partnered with Ministry of Earth Sciences' India Meteorological Department (IMD) to develop climate solutions for stakeholders at the village, city, and district levels?
- Indian Institute of Technology, Bombay
  - Indian Institute of Technology, Kharakpur
  - Indian Institute of Technology, Madras
  - Indian Institute of Technology, Pune

82. Which Biosphere reserve in India became the 11<sup>th</sup> one to be included in the World Network of Biosphere Reserves?

- a) Nanda Devi
- b) Dibru-Saikhowa
- c) Khangchendzonga
- d) Dehang Debang

83. Which among the following contribute to the deposition of sediments in the ocean?

- 1) Volcanic eruption
- 2) Erosion and Deposition
- 3) Decay and decomposition of marine organisms

Which of the above statements is/are correct?

- a) 1 only
- b) 2 only
- c) 3 only
- d) 1, 2, and 3

84. The accounts of which of the following are not audited by CAG?

- a) Municipal institutions
- b) State Governments
- c) Government Companies
- d) Central Government

85. Which of the following is a compilation on physics and astronomy, translated from Sanskrit to Persian:

- a) Dala'il-i Firuz Shahi
- b) Kitab fi tahqiq ma li'l-Hind
- c) Ghurra al-kamal
- d) Muhaqqiq-i Hindi

86. Akbar invented a special kind of hunting sport named

- a) Shikar
- b) Safra
- c) Shikast
- d) Qamargha

87. The economic policy of the British in India was to

- a) Industrialize India
- b) Bring India to the level of western countries
- c) Promote the material prosperity of the Indians
- d) Convert India into an agrarian satellite of the metropolitan capitalism

88. Ibn Batuta visited India during the reign of

- a) Razia
- b) Aramshah
- c) Muhammed bin Tughluq
- d) Feroz shah Tughluq

89. Which Governor General introduced postage stamps in India?
- Lord Wellesley
  - Lord William Benting
  - Lord Dalhousie
  - Lord Mountbatten
90. Which of the following class of people did not show their support to the Mutiny?
- The Indian Royals
  - Peasants and Artisans
  - Land Aristocracy and Zamindars
  - The new middle class
91. In which of the following Ashoka's inscription, the description of Kalinga's war genocide is present?
- Rock Edict X
  - Rock Edit XII
  - Rock Edit XIII
  - Rock Edit XIV
92. Which Indian was the pioneer of science of Metrics?
- Pururva
  - Pingal
  - Nighantu
  - Nichiketa
93. Consider the following statements regarding PALM 400 Drones.
- The PALM 400 – acronym for 'Precision Attack Loitering Munition' is a a long-range, high-precision loitering munition system.
  - It is the result of joint venture between Flytrex Systems (Israel), UVision Air Ltd, and Birla Precitech Private Ltd (BPPL)
  - It can be discharged from a canister and fly 3000-4000 feet above a kill zone for up to 120 minutes.
  - It has a range of more than 100 km and travels at a speed of 50 to 140 knots (90 to 260 km/h).
- Which of the above statements are correct? Choose the correct option.
- 1 and 4 only
  - 1, 2 and 3 only
  - 1, 3 and 4 only
  - 1, 2, 3 and 4

94. Consider the following statements regarding *Bharat 6G Vision Document*.
- 1) The document was prepared by the STG Group under the Department of Science & Technology, Government of India.
  - 2) India's 6G mission will be in two phases: the first one from 2023 to 2025 and the second one from 2025 to 2030.
  - 3) During Phase 1 Support will be provided to explorative ideas, risky pathways and proof-of-concept tests.
  - 4) During Phase 2, the focus will be on commercialization of the ideas and concepts.
- Which of the above statements are correct? Choose the correct option.
- a) 1, 2 and 3 only
  - b) 1, 2 and 4 only
  - c) 2, 3 and 4 only
  - d) 1, 2, 3 and 4
95. National Institute of Disaster management headquarter is located at
- a) Dehradun
  - b) Kolkata
  - c) Chennai
  - d) New Delhi
96. A ring of narrow growing corals animals of horseshoe shape and crowned with palm trees is called
- a) Algae ridge
  - b) Atoll
  - c) Patch reef
  - d) Coral pinnacle
97. Which one is correct sequence of countries, in decreasing order, in respect of per-capita CO<sub>2</sub> emission?
- a) USA-China-Canada
  - b) USA-China-Japan
  - c) USA-China-Germany
  - d) USA-Canada-Japan
98. Consider the following sources of the Indian Constitution.
- (1) Directive Principle of State Policy- Irish Constitution
  - (2) Advisory Jurisdiction of the Supreme Court- Canadian Constitution
  - (3) Concurrent List –US Constitution
  - (4) Parliamentary Privileges- British Constitution
- Which of the following is the correct option?
- a) 1, 2 and 4
  - b) 2, 3 and 4
  - c) 1, 3 and 4
  - d) 1, 2 and 3

99. By which Constitutional Amendment Bihar became free from the obligation of having a tribal welfare minister in the state council of ministers?
- a) 84 th Constitutional Amendment
  - b) 94 th Constitutional Amendment
  - c) 104 th Constitutional Amendment
  - d) 74 th Constitutional Amendment
100. Which of the following country has joined NATO in April 2023?
- a) Denmark
  - b) Belgium
  - c) Poland
  - d) Finland
101. Which of the following countries will host the 15<sup>th</sup> BRICS summit?
- a) Brazil
  - b) South Africa
  - c) China
  - d) Russia
102. India's largest Nuclear Power Plant is located in which of the following state?
- a) Tamil Nadu
  - b) Maharashtra
  - c) Uttar Pradesh
  - d) Karnataka
103. The Election Commission recently has launched a year long voter awareness program on All India Radio. What is the name of this program?
- a) Voter junction
  - b) Radio Junction
  - c) Election Junction
  - d) Matadata Junction
104. In which of the following cities the National Climate Conclave 2023 was held?
- a) Hyderabad
  - b) Lucknow
  - c) New Delhi
  - d) Ranchi



105. With reference to the Indian Science Congress ( ISC), which of the following statements is/are correct?

1. 108<sup>th</sup> convention of ISC was held at RTM, Nagpur University
2. It's theme was " science and Technology for every Nation"
3. Convention was held in January 2023

Select the correct answer using the code given below

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1,2 and 3

106. Name the scheme launched by the Ministry of Social Justice and Empowerment for the welfare of the Transgender Community and the beggars?

- a) SMILE
- b) WINNER
- c) PROUD
- d) SPARK

107. The Sixth Edition of the Indian Ocean Conference took place at

- a) New Delhi
- b) Dhaka
- c) Beijing
- d) Naypyidaw

108. Which was the last state of the Kangra group losing its independence to the Sikhs?

- a) Kulehar
- b) Guler
- c) Dattapur
- d) Kullu

109. Among which of the regional and sub-regional groups both India and Nepal are not members?

- a) SAARC
- b) BIMSTEC
- c) BBIN
- d) ASEAN

110. Which of the following country has won the ICC Women's World Cup 2022 title?

- a) New Zealand
- b) Australia
- c) England
- d) West Indies

Find the wrong number in following number series:

111. 5, 6, 14, 45, 184, 920, 5556

- a) 5
- b) 6
- c) 14
- d) 920

112. In a certain shop, notebooks that normally sell for Rs. 9 each are on sale at 2 for Rs. 15. How much can be saved by purchasing 10 of these notebooks at the sale price?

- a) Rs.9
- b) Rs.10
- c) Rs.15
- d) Rs.19

113. 6 men take 9 days to complete a piece of work by working for 12 hours a day. Speed of one man is equal to that of 4 children. If the work is to be completed only by children with help of 2 men in 6 days by working for 6 hours a day, then how many children's are required?

- a) 56
- b) 44
- c) 42
- d) 64

114. A boatman goes 8 km against the current of the stream in 2 hour and goes 6 km along the current in 30 minutes. How long will it take to go 12 km in stationary water?

- a) 2 hr 15 min
- b) 1 hr 45 min
- c) 1 hr 30 min
- d) 2 hr

115. On 6<sup>th</sup> Dec, 2007 Thursday falls. What day of the week was it on 9<sup>th</sup> March, 2008?

- a) Saturday
- b) Sunday
- c) Monday
- d) Tuesday

116. The salary of a person was reduced by 5% .By what percent should his reduced salary be raised so as to bring it at par with his original salary?

- a) 7.15%
- b) 9.05%
- c) 6.75%
- d) 5.26%

117. In a room of 40 people what is the probability that at least two people have the same birthday?
- a) 41.1 %
  - b) 89.1%
  - c) 11.7%
  - d) 2.7%
118. A man has 250 gold coins. He wishes to distribute them into bags such that he can pay any sum from 1 to 250 by handing over some bags. What is the minimum number of bags required?
- a) 8
  - b) 9
  - c) 10
  - d) 7
119. B is the only son of A who is the only daughter of C. E is the mother of F and daughter-in-law of A. How is F related to C?
- a) Grand Daughter
  - b) Grandson
  - c) Grand Grand Daughter
  - d) Cannot be determined
120. If DELHI is coded as EGOLN, then how is BANGALORE coded in same language?
- a) CBQKDFRVN
  - b) CWDPRVKVN
  - c) CBMHBMQSF
  - d) CCQKFRVZN

\*\*\*\*\*

# **SPACE FOR ROUGH WORK**

# PUNJAB PUBLIC SERVICE COMMISSION

Objective Type Test (May-2023) for Recruitment to the Post of Assistant Scientific Officer (Group A) in the Department of Science, Technology and Environment, Govt. of Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Total Questions: 120  
Time Allowed: 2 Hours

Candidate's Name \_\_\_\_\_

Father's Name \_\_\_\_\_

Date of Birth        
DD MM YYYY

OMR Response Sheet No. \_\_\_\_\_

Roll No. \_\_\_\_\_

Candidate's Signature (Please sign in the box)

Question Booklet Set
<b>C</b>
Booklet Series

## INSTRUCTIONS

1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant boxes out of 1 to 9 of the Optical Mark Reader (OMR) response sheet, supplied separately.
2. Use only blue or black **ball point pen** to fill the relevant columns on this page as well as in OMR sheet. Use of Ink pen or any other pen is not allowed.
3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible or incomplete.
4. Each candidate is required to attempt 120 questions in 120 minutes, except for orthopedically/visually impaired candidates, who would be given 40 extra minutes, for marking correct responses on the OMR sheet.
5. The question paper booklet has 22 pages.
6. The candidates, when allowed to open the question paper booklet, must first check the entire booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should IMMEDIATELY bring this fact to the notice of the Invigilation Staff and obtain a new booklet of the same series as given earlier.
7. The serial number of the new Question booklet if issued for some reason should be entered in the relevant column of the OMR. The Invigilation Staff must make necessary corrections in their record regarding the change in the serial no. of Question booklet.
8. The paper consists of total 480 Marks. Each question shall carry 4 marks. There are four options for each question and the candidate has to mark the MOST APPROPRIATE answer on the OMR response sheet.
9. There is negative marking (1 mark for each question) for questions wrongly answered by the candidate.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidate **MUST READ INSTRUCTIONS BEHIND THE OMR SHEET** before answering the questions and check that two carbon copies attached to the OMR sheet are intact.

Find the wrong number in following number series:

1. 5, 6, 14, 45, 184, 920, 5556
  - a) 5
  - b) 6
  - c) 14
  - d) 920
  
2. In a certain shop, notebooks that normally sell for Rs. 9 each are on sale at 2 for Rs. 15. How much can be saved by purchasing 10 of these notebooks at the sale price?
  - a) Rs.9
  - b) Rs.10
  - c) Rs.15
  - d) Rs.19
  
3. 6 men take 9 days to complete a piece of work by working for 12 hours a day. Speed of one man is equal to that of 4 children. If the work is to be completed only by children with help of 2 men in 6 days by working for 6 hours a day, then how many children's are required?
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  - b) 44
  - c) 42
  - d) 64
  
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  - b) 1 hr 45 min
  - c) 1 hr 30 min
  - d) 2 hr
  
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  - d) Tuesday
  
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  - b) 9.05%
  - c) 6.75%
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  - 10
  - 7
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- Grand Daughter
  - Grandson
  - Grand Grand Daughter
  - Cannot be determined
10. If DELHI is coded as EGOLN, then how is BANGALORE coded in same language?
- CBQKDFRVN
  - CWDPRVKVN
  - CBMHBMQSF
  - CCQKFRVZN
11. 'ਅਨੋਖਾ' ਸ਼ਬਦ ਦੇ ਸਮਾਨਾਰਥਕ ਸ਼ਬਦਾਂ ਦਾ ਸਹੀ ਜੁੱਟ ਚੁਣੋ:
- ਅਸਚਰਜ, ਅਦਭੁੱਤ, ਖਰਾਬ
  - ਅਨੁਪਮ, ਅਦਭੁੱਤ, ਵਚਿੱਤਰ
  - ਵਚਿੱਤਰ, ਬੁਰਾ, ਅਦਭੁੱਤ
  - ਅਦਭੁੱਤ, ਅਲੌਕਿਕ, p/ fw; kb
12. 'ਇੱਕ ਸੱਪ ਦੂਜਾ ਉੱਡਣਾ' ਕਿਸ ਸੰਦਰਭ ਵਿੱਚ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ:
- ਕਰਤਬ ਕਰਨ ਵਾਲਾ ਸੱਪ
  - ਖੰਬਾਂ ਵਾਲਾ ਸੱਪ
  - ਖਤਰਾ ਮੋਲ ਲੈਣਾ
  - ਬਹੁਤ ਖਤਰਨਾਕ ਹੋਣਾ

13. ਸੁੱਧ-ਅਸੁੱਧ ਦਾ ਸਹੀ ਜੋੜਾ ਚੁਣੋ:

- a) ਕਟੜ/ਕਟੜ
- b) ਪਿੰਡ/ਪਿੱਡ
- c) ਓਪਾਏ/ਉਪਾਯ
- d) ਸੰਘ/ਸੰਘ

14. 'ਝਗੜਾਲੂ' ਵਿੱਚ ਵਰਤਿਆ ਪਿਛੇਤਰ ਹੈ:

- a) ਆਲੂ
- b) ਝਾਲੂ
- c) ਅਲ
- d) ਲੂ

15. ਸਹੀ ਜੁੱਟ ਦੱਸੋ:

- a) ਗੱਭਰੂ/ਤੀਵੀਂ
- b) ਸਾਲਾ/ਸਾਲਣੀ
- c) ਉੱਲੂ/ਬਤੌਰੀ
- d) ਨਵਾਬ/ਮਲਕਾ

16. 56 ਨੂੰ ਪੰਜਾਬੀ ਵਿੱਚ ..... ਕਹਿੰਦੇ ਹਨ:

- a) ਛੱਪੰਨ
- b) ਛਪੰਜੀ
- c) ਛਪੰਝਾ
- d) ਛਪੰਜਾ

17. ਪੰਜਾਬ ਵਿੱਚ ਕਿਹੜੇ ਪੰਜ ਦਰਿਆ ਵਗਦੇ ਸਨ:

- a) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- b) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ
- c) ਸਰਸਵਤੀ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- d) ਸਤਲੁਜ, ਘੱਗਰ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ

18. jgrwvW dI rOSnI dw mylw iks mhIny ivc l`gdw hY?

- a) BwdoN
- b) cyq
- c) P`gx
- d) jyT



19. “ਉੱਠੋ ਤਾਂ ਉੱਠ ਨਹੀਂ.....”।

- a) ਸੁਤਕ ਰਹਿ
- b) ਨੀਂਦ ਦਕ ਮਜਕ ਲੁੱਟ
- c) ਠੂਠਕ ਫੁਟ
- d) ਰੇਤੇ ਦਹ ਮੁੱਠ

20. ‘ਟਕਇਮ ਬਕਉਂਡ’ ਦਕ ਸੁੱਧ ਪੰਜਕਬਹ ਰੂਪ ਲਿਖੇ -

- a) ਮਿਤਹ-ਬੱਧ
- b) ਸਮਾਂ-ਸੂਚਕ
- c) ਮਿਤਹ ਤੋਂ
- d) ਤਕਰਹਖ

21. The general conditions for using “Autoclave” during sterilization of samples in a microbiology laboratory are

- a) Temperature = 121 °C, Pressure = 15 psi
- b) Temperature = 15 °C, Pressure = 121 psi
- c) Temperature = 100 °C, Pressure = 10 psi
- d) Temperature = 121 °C, Pressure = 25 psi

22. During microbial growth, the phase during which microbes are adapted to the environment is called

- a) Exponential Phase
- b) Log Phase
- c) Lag Phase
- d) Stationary Phase

23. Among the following, Fecal indicator bacteria is

- a) *Pseudomonas aeruginosa*
- b) *Bacillus subtilis*
- c) *Salmonella typhi*
- d) *Escherichia coli*

24. Agar-agar used in microbiology laboratory is mainly obtained by

- a) Golden algae
- b) Red algae
- c) Yeast
- d) Cyanobacteria

25. The poisoning of central nervous system with organic mercurial is known as

- a) Minamata disease
- b) Methamoglobinemia
- c) Both of the above
- d) None of the above

26. Identify the incorrect statement about carbon isotopes
- C-13 is less abundant in vegetation than in ocean
  - C-12 is most abundant in nature
  - C-14 is absent in fossil fuel
  - C-13 is used for carbon –dating
27. Corona-virus structure is composed of
- outer protein coat and central core of nucleic acid
  - outer nucleic acid and proteinous central core
  - outer proteinous coat and central DNA core
  - outer proteinous coat and central RNA
28. Whenever there is high BOD, DO is less so much that fish cannot survive in lake water because
- Fish utilize all Oxygen
  - Bacteria utilize all Oxygen
  - Algae utilize all oxygen
  - Biological compound are toxic to fish
29. Arsenic problem in India is primarily due to
- Over exploitation of Arsenopyrite in the hinterland
  - Over exploitation of coal in Bihar and West Bengal
  - Over exploitation of groundwater in affected areas
  - Over exploitation of surface water in the affected area
30. When the industry with 'Red' Category is to be established, it is necessary to have a public hearing or inquiry under the procedure called as
- Environmental Health Hazard (EHH)
  - Environmental Litigation (EL)
  - Environmental Management Systems (EMS)
  - Environmental Impact Assessment (EIA)
31. The bacteria responsible for deposition of iron oxide in water pipes is
- Gallionella*
  - Klebsiella*
  - Thermococcus*
  - Heliocobacter*
32. Which of the following is true?
- Benzene hexachloride is a non biodegradable pollutant
  - Carbon dioxide is a primary air pollutant
  - Sulphur dioxide causes brown air effect during traffic congestion in cities
  - Anthropogenic air pollutants are natural in origin
- i and ii only
  - ii and iii only
  - i and iv only
  - iii and i only

33. Severe drought is declared if
- Deficit of rainfall is more than 50 percent of the normal
  - Deficit of rainfall varies between 25- 45 percent of the normal
  - Rainfall deficit exceeds 25 percent of the normal
  - Rainfall deficit is between 15 -25 percent
34. C<sub>4</sub> plants are commonly found in
- Humid and low temperature environment
  - Arid and hot environment
  - Temperate environment
  - Semi-humid environment
35. Recently implemented UN Sustainable Development Goal (SDG) has how many goals to achieve by 2030?
- a) 10      b) 17      c) 30      d) None of the above
36. According to IPCC, during the 20<sup>th</sup> century earth's mean surface temperature has risen by approximately
- 0.4°C
  - 0.6°C
  - 0.8°C
  - 1.0°C
37. Green Climate Fund (GCF) is established to limit or reduce emission in
- Developing countries
  - NATO member countries
  - Ukraine war affected areas
  - Developed countries
38. The Polluter pay principle was first conceptualized by the
- G 20 countries
  - OECD countries
  - European countries
  - America
39. Which gas is produced from the guts of cattle that is a major greenhouse gas?
- CO<sub>2</sub>
  - CFC
  - Halons
  - Methane

40. Ozone depletion in the Stratosphere may not create which of the following problem in human being?
- Liver disease
  - Anemia
  - Eye Cataracts
  - Skin Cancer
41. Montreal Protocol is a multilateral environmental agreement related to control the Ozone layer depletion was adopted in which year ?
- 1992
  - 1987
  - 1999
  - 2006
42. A current news articles writes “Climate change making Earth uninhabitable...” Guterres warns. Who is Antonio Guterres ?
- Environment Minister of South Africa
  - UN Secretary- General
  - Canadian Environment minister
  - Famous Nobel recipient on Environment
43. “Where there is a risk of severe damage to the environment but absence of any scientific or conclusive proof for the reason , we must stop that activity being safe than sorry”, was given in Rio Declaration of 1992. This is related to
- Green Wash
  - Deep Ecology
  - Precautionary principle
  - Blue risk principle
44. In the Paris Agreement of Climate change, India has taken its pledge that it will reduce the emission intensity of its GDP by 2030 at level of
- 45%
  - 30%
  - 25%
  - 19%
45. Which article of the Indian constitution directs that the State shall endeavour to Protect and improve the environment and to safeguard the forest and wildlife of the country
- 51 A
  - 12 B
  - 48A
  - 8A
46. A developmental project requires both environmental clearance as well as approval under
- Water act, 1974
  - Forest Conservation Act,1980
  - National Environmental Tribunal Act,1995
  - Air Act, 1981

47. According to Environment (Protection) Act,1986 permissible limits of oil and grease in the effluents to be discharged into public sewers is
- 10 mg/ l
  - 20 mg /l
  - 25 mg/ l
  - 30 mg/ l
48. The title of the Brundtland report is
- Caring for Earth
  - Caring of Biosphere
  - Our common Future
  - The Silent space
49. Under the Air Act 1981, which body is empowered to set standard for ambient air quality?
- MoEF &CC
  - State Pollution Control Board
  - Central Pollution Control Board
  - Ministry of Road Transport
50. Access Benefit Sharing (ABS) is an important component in the Environmental legislation of
- FCA 1980
  - Water Act,1974
  - Environment (Protection ) Act 1986
  - Biodiversity Act,2002
51. The Project Snow leopard, was launched in India to safeguard and conserve the high altitude habitat for the animal in the year
- 2015
  - 2005
  - 2011
  - 2009
52. What is the key difference between the Forest (conservation) Act 1980 and Indian Forest Act 1927?
- The Forest (conservation) Act 1980, came in to force to address deforestation, whereas Indian Forest Act 1927 was geared to allow the colonial British administration to control extraction of timber.
  - Tribal people were given more rights in Forest conservation Act,1980 but in IFA,1927 has no power to tribals stay around forest.
  - FCA,1980 focused more of wildlife protection but IFR,1927 was more of Timber protection
  - No one is correct

53. In a frequency distribution, the median and mean is 15 and 12 respectively, find the mode.

- a) 11
- b) 21
- c) 41
- d) 45

54. What is the difference between Type I and Type II errors in statistical hypothesis testing?

- a) Type I error occurs when we reject a null hypothesis that is true, while Type II error occurs when we accept a null hypothesis that is false.
- b) Type I error occurs when we accept a null hypothesis that is false, while Type II error occurs when we reject a null hypothesis that is true.
- c) Type I error occurs when we reject a null hypothesis that is false, while Type II error occurs when we accept a null hypothesis that is true.
- d) Type I error occurs when we accept a null hypothesis that is true, while Type II error occurs when we reject a null hypothesis that is false.

55. If the standard deviation of a data is 0.012. Find the variance.

- a) 0.144
- b) 0.00144
- c) 0.000144
- d) 0.0000144

56. Consider the following unclassified frequency distribution

X:	Frequency
1	8
2	10
3	11
4	16
5	20
6	25
7	15
8	9
9	6

The median of the above given unclassified frequency distribution is

- a) 1
- b) 2
- c) 5
- d) 7

57. If  $y^2 = 4x$  and 0.1% error is incurred for  $y$ , the percentage error involved in  $x$  will be

- a) 0.4
- b) 0.025
- c) 0.1
- d) 0.05

58. In which of the following activities silicon carbide is used?

- a) Making cement and glass
- b) Disinfecting pond water
- c) Making casts for statues
- d) Cutting very hard substances

59. *Lantana camara*— know as Phool Lakhri in local parlance is a shrub found in abundance in Himachal Pradesh. Which of the following statements are correct about it?

1. It is a toxic weed and has affected the mountain diversity of the state.
2. *Lantana* species are widely cultivated for their flowers.
3. It is endemic to India.
4. It is considered as potential fire hazard and it is combustible even when green.

- a) 1 & 3 only
- b) 2 & 4 only
- c) 1, 2 & 4 only
- d) 1, 2, 3 and 4

60. Which article of the CBD states that, “*as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species*”.

- a) Article 8(d)
- b) Article 8(h)
- c) Article 9(d)
- d) Article 9(h)

61. Which one of the following is not a bio-indicator of water pollution?

- a) Blood-worms
- b) Sludge-worms
- c) Sewage fungus
- d) Stone flies

62. The accumulation of partially decayed vegetation or organic matter in wet areas results in the formation of

- a) Moss
- b) Peat
- c) Coal
- d) Fossils

63. Relative contributions of CO<sub>2</sub>, CH<sub>4</sub>, CFCs and N<sub>2</sub>O towards global warming are:
- 50 %, 30 %, 10 %, and 10 % respectively
  - 60%, 20%, 14%, and 6% respectively
  - 40 %, 30%, 20% and 10% respectively
  - 35 %, 15%, 10% and 5% respectively
64. Which one of the following treaty is related to the control of trans-boundary movements of hazardous wastes and their disposal?
- Basel Convention
  - Ramsar Convention
  - Montreal Protocol
  - Cartagena Protocol
65. Which among the following is India's first state to release a Climate Change Action Plan?
- Himachal Pradesh
  - Delhi
  - Haryana
  - Kerala
66. In context of environment, the term "dirty dozen" refers to
- 12 most harmful greenhouse gases
  - 12 ozone depleting substances
  - 12 persistent organic pollutants
  - 12 acid rain substances
67. \_\_\_\_\_ is caused by careless handling of instruments.
- Systematic Error
  - Random Error
  - Gross Error
  - Fine Error
68. Which of these International agreements was adopted with the objective to ensure access to genetic resources and fair and equitable sharing of benefits arising from their use?
- Cartagena Protocol 2000
  - Nagoya Protocol 2010
  - Paris Agreement 2015
  - Rio Declaration 1992
69. What is the oxidation number of Cr atom in K<sub>3</sub>CrO<sub>8</sub>?
- +2
  - +3.5
  - +5
  - 5.3



70. For which of the following reaction  $\Delta H = \Delta U$ ?

- a)  $\text{H}_2(\text{g}) + \text{Br}_2(\text{g}) \rightarrow 2\text{HBr}(\text{g})$
- b)  $\text{C}(\text{s}) + 2\text{H}_2\text{O}(\text{g}) \rightarrow 2\text{H}_2(\text{g}) + \text{CO}_2(\text{g})$
- c)  $\text{PCl}_5(\text{g}) \rightarrow \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$
- d)  $2\text{CO}(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g})$

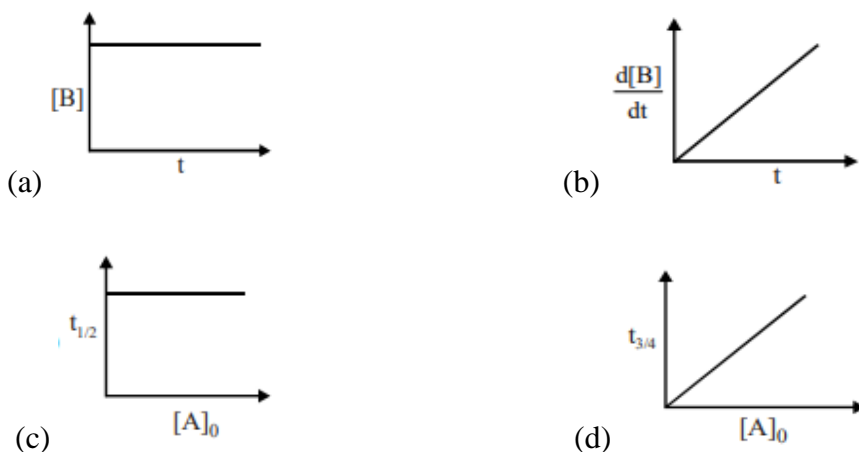
71. For an ideal gas at 300K

- a)  $\left(\frac{\partial U}{\partial V}\right)_T = 0$
- b)  $\left(\frac{\partial U}{\partial T}\right)_V = 0$
- c)  $\left(\frac{\partial H}{\partial T}\right)_P = 0$
- d)  $\left(\frac{\partial G}{\partial T}\right)_P = 0$

72. Which of the following is an example of a polymer used in 3D printing?

- a) Polylactic acid
- b) Bakelite
- c) Polyurethane
- d) Polyethylene terephthalate

73. Which graph represents zero order reaction  $[\text{A}(\text{g}) \rightarrow \text{B}(\text{g})]$



74. The change in entropy for a reversible adiabatic process is

- a) Maximum
- b) Minimum
- c) zero
- d) positive

75. Match the metal given in Column-A with its medicinal use as a compound in Column-B

Column-A	Column-B
(A) Gd	(I) Cancer
(B) Au	(II) Maniac depression
(C) Pt	(III) MRI contrast agent
(D) Li	(IV) Arthritis

Correct match is

- a) A-II; B-III; C-IV; D-I                      b) A-III; B-IV; C-I; D-II  
c) A-IV; B-II; C-I, D-III                      d) A-I; B-II; C-III; D-IV

76. In which chromatography stationary phase is more polar than mobile phase?

- a) Normal phase chromatography              b) Gas chromatography  
c) Size exclusion chromatography            d) Liquid chromatography

77. In common glass electrode, alkaline error caused at  $\text{pH} > 10$  is least for

- a) 0.01M NaCl                                      b) 1.0M NaCl  
c) 1.0M LiCl                                        d) 1.0M KCl

78. When the intensity of absorption maximum  $E_{\text{max}}$  increases on certain modifications in an organic compound the effect is called

- a) Hypochromic Effect                            b) Hypsochromic Shift  
c) Hyperchromic shift                            d) Chemical Shift

79. Which one of the following statement is false for IR spectroscopy

- a) A conjugation decreases the C=O stretching frequency  
b) Higher the frequency if more strained the acyclic ring containing C=O group  
c) Electron releasing substituents decrease the frequency of C=O bond  
d) Electron withdrawing substituents decrease the frequency of C=O bond

80. Which one of the following is  $\text{C}\equiv\text{C}$  stretching for internal alkyne?

- a) 790-840  $\text{cm}^{-1}$                                 b) 910-990  $\text{cm}^{-1}$   
c) 2100-2250  $\text{cm}^{-1}$                               d) 3200-3250  $\text{cm}^{-1}$

81. How much fly ash must thermal power plants that burn coal and lignite use in accordance with recent changes to the Environmental Protection Act?

- a) 50%  
b) 33%  
c) 100%  
d) 5%

82. Which state's famous 'Living Root Bridge' Cultural Landscapes have been tentatively added to the list of UNESCO World Heritage Sites?
- Meghalaya
  - Karnataka
  - Jammu & Kashmir
  - Sikkim
83. A geostationary satellite appears stationary relative to the earth. Such a satellite appears stationary due to its zero relative velocity with respect to a place on earth. The distance of a geostationary satellite from the centre of earth with radius  $R$ , is
- $5R$
  - $6.6R$
  - $8.2R$
  - $7.4R$
84. Venus is the second planet from the Sun. Venus is a terrestrial planet and is sometimes called Earth's "sister planet" because of their similar size, mass, proximity to the Sun, and bulk composition. Which gas dominates the atmosphere of Venus?
- nitrogen
  - oxygen
  - carbon dioxide
  - Ozone
85. A software that hijacks your computer and asks you to pay, in order to get removed
- Key logging
  - Trojan
  - Encrypting malware
  - Ransomware
86. The phenomenon on which Optical fiber works is
- Diffraction
  - Scattering
  - Refraction
  - Total internal reflection
87. Which of the following does not belong to Amritsar?
- Ram Tirath
  - Gobindgarh Fort
  - Patalpuri Sarovar
  - Ramgarhia Fort
88. Who wrote the Punjabi novel *Eho Hamara Jeevna*?
- Amrita Pritam
  - Kartar Singh Duggal
  - Dalip Kaur Tiwana
  - Gurdial Singh

89. If a radioactive material has a half-life of 1 year, then its mass reduces to 6.25% in
- 1/2 years
  - 2 years
  - 3 years
  - 4 years
90. Mobile Autonomous Launcher (MAL) is
- A state-of-the-art Land Based Weapon Complex
  - It consists of three missiles in ready to launch configuration housed in containers
  - Radar receivers for target information and ultra-advanced Fire Control System for coordinating the launch
  - All of the above
91. Which of the following institute has partnered with Ministry of Earth Sciences' India Meteorological Department (IMD) to develop climate solutions for stakeholders at the village, city, and district levels?
- Indian Institute of Technology, Bombay
  - Indian Institute of Technology, Kharakpur
  - Indian Institute of Technology, Madras
  - Indian Institute of Technology, Pune
92. Which Biosphere reserve in India became the 11<sup>th</sup> one to be included in the World Network of Biosphere Reserves?
- Nanda Devi
  - Dibru-Saikhowa
  - Khangchendzonga
  - Dehang Debang
93. Which among the following contribute to the deposition of sediments in the ocean?
- Volcanic eruption
  - Erosion and Deposition
  - Decay and decomposition of marine organisms
- Which of the above statements is/are correct?
- 1 only
  - 2 only
  - 3 only
  - 1, 2, and 3
94. The accounts of which of the following are not audited by CAG?
- Municipal institutions
  - State Governments
  - Government Companies
  - Central Government

95. Which of the following is a compilation on physics and astronomy, translated from Sanskrit to Persian:
- Dala'il-i Firuz Shahi
  - Kitab fi tahqiq ma li'l-Hind
  - Ghurrat al-kamal
  - Muhaqqiq-i Hindi
96. Akbar invented a special kind of hunting sport named
- Shikar
  - Safra
  - Shikast
  - Qamargha
97. The economic policy of the British in India was to
- Industrialize India
  - Bring India to the level of western countries
  - Promote the material prosperity of the Indians
  - Convert India into an agrarian satellite of the metropolitan capitalism
98. Ibn Batuta visited India during the reign of
- Razia
  - Aramshah
  - Muhammed bin Tughluq
  - Feroz shah Tughluq
99. Which Governor General introduced postage stamps in India?
- Lord Wellesley
  - Lord William Benting
  - Lord Dalhousie
  - Lord Mountbatten
100. Which of the following class of people did not show their support to the Mutiny?
- The Indian Royals
  - Peasants and Artisans
  - Land Aristocracy and Zamindars
  - The new middle class
101. In which of the following Ashoka's inscription, the description of Kalinga's war genocide is present?
- Rock Edict X
  - Rock Edit XII
  - Rock Edit XIII
  - Rock Edit XIV
102. Which Indian was the pioneer of science of Metrics?
- Pururva
  - Pingal
  - Nighantu
  - Nichiketa

103. Consider the following statements regarding PALM 400 Drones.

- 1) The PALM 400 – acronym for ‘Precision Attack Loitering Munition’ is a long-range, high-precision loitering munition system.
- 2) It is the result of joint venture between Flytrex Systems (Israel), UVision Air Ltd, and Birla Precitech Private Ltd (BPPL)
- 3) It can be discharged from a canister and fly 3000-4000 feet above a kill zone for up to 120 minutes.
- 4) It has a range of more than 100 km and travels at a speed of 50 to 140 knots (90 to 260 km/h).

Which of the above statements are correct? Choose the correct option.

- a) 1 and 4 only
- b) 1, 2 and 3 only
- c) 1, 3 and 4 only
- d) 1, 2, 3 and 4

104. Consider the following statements regarding *Bharat 6G Vision* Document.

- 1) The document was prepared by the STG Group under the Department of Science & Technology, Government of India.
  - 2) India’s 6G mission will be in two phases: the first one from 2023 to 2025 and the second one from 2025 to 2030.
  - 3) During Phase 1 Support will be provided to explorative ideas, risky pathways and proof-of-concept tests.
  - 4) During Phase 2, the focus will be on commercialization of the ideas and concepts.
- Which of the above statements are correct? Choose the correct option.

- a) 1, 2 and 3 only
- b) 1, 2 and 4 only
- c) 2, 3 and 4 only
- d) 1, 2, 3 and 4

105. National Institute of Disaster management headquarter is located at

- a) Dehradun
- b) Kolkata
- c) Chennai
- d) New Delhi

106. A ring of narrow growing corals animals of horseshoe shape and crowned with palm trees is called

- a) Algae ridge
- b) Atoll
- c) Patch reef
- d) Coral pinnacle

107. Which one is correct sequence of countries, in decreasing order, in respect of per-capita CO<sub>2</sub> emission?

- a) USA-China-Canada
- b) USA-China-Japan
- c) USA-China-Germany
- d) USA-Canada-Japan

108. Consider the following sources of the Indian Constitution.

- (1) Directive Principle of State Policy- Irish Constitution
- (2) Advisory Jurisdiction of the Supreme Court- Canadian Constitution
- (3) Concurrent List –US Constitution
- (4) Parliamentary Privileges- British Constitution

Which of the following is the correct option?

- a) 1, 2 and 4
- b) 2, 3 and 4
- c) 1, 3 and 4
- d) 1, 2 and 3

109. By which Constitutional Amendment Bihar became free from the obligation of having a tribal welfare minister in the state council of ministers?

- a) 84 th Constitutional Amendment
- b) 94 th Constitutional Amendment
- c) 104 th Constitutional Amendment
- d) 74 th Constitutional Amendment

110. Which of the following country has joined NATO in April 2023?

- a) Denmark
- b) Belgium
- c) Poland
- d) Finland

111. Which of the following countries will host the 15<sup>th</sup> BRICS summit?

- a) Brazil
- b) South Africa
- c) China
- d) Russia

112. India's largest Nuclear Power Plant is located in which of the following state?

- a) Tamil Nadu
- b) Maharashtra
- c) Uttar Pradesh
- d) Karnataka

113. The Election Commission recently has launched a year long voter awareness program on All India Radio. What is the name of this program?

- a) Voter junction
- b) Radio Junction
- c) Election Junction
- d) Matadata Junction

114. In which of the following cities the National Climate Conclave 2023 was held?

- a) Hyderabad
- b) Lucknow
- c) New Delhi
- d) Ranchi

115. With reference to the Indian Science Congress (ISC), which of the following statements is/are correct?

1. 108<sup>th</sup> convention of ISC was held at RTM, Nagpur University
2. It's theme was "science and Technology for every Nation"
3. Convention was held in January 2023

Select the correct answer using the code given below

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1,2 and 3

116. Name the scheme launched by the Ministry of Social Justice and Empowerment for the welfare of the Transgender Community and the beggars?

- a) SMILE
- b) WINNER
- c) PROUD
- d) SPARK

117. The Sixth Edition of the Indian Ocean Conference took place at

- a) New Delhi
- b) Dhaka
- c) Beijing
- d) Naypyidaw

118. Which was the last state of the Kangra group losing its independence to the Sikhs?

- a) Kulehar
- b) Guler
- c) Dattarpur
- d) Kullu



119. Among which of the regional and sub-regional groups both India and Nepal are not members?

- a) SAARC
- b) BIMSTEC
- c) BBIN
- d) ASEAN

120. Which of the following country has won the ICC Women's World Cup 2022 title?

- a) New Zealand
- b) Australia
- c) England
- d) West Indies

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# **SPACE FOR ROUGH WORK**

# PUNJAB PUBLIC SERVICE COMMISSION

Objective Type Test (May-2023) for Recruitment to the Post of Assistant Scientific Officer (Group A) in the Department of Science, Technology and Environment, Govt. of Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Total Questions: 120  
Time Allowed: 2 Hours

Candidate's Name \_\_\_\_\_

Father's Name \_\_\_\_\_

Date of Birth        
DD MM YYYY

OMR Response Sheet No. \_\_\_\_\_

Roll No. \_\_\_\_\_

Candidate's Signature (Please sign in the box)

Question Booklet Set
<b>D</b>
Booklet Series

## INSTRUCTIONS

1. The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant boxes out of 1 to 9 of the Optical Mark Reader (OMR) response sheet, supplied separately.
2. Use only blue or black **ball point pen** to fill the relevant columns on this page as well as in OMR sheet. Use of Ink pen or any other pen is not allowed.
3. The candidate shall be liable for any adverse effect if the information given above is wrong or illegible or incomplete.
4. Each candidate is required to attempt 120 questions in 120 minutes, except for orthopedically/visually impaired candidates, who would be given 40 extra minutes, for marking correct responses on the OMR sheet.
5. The question paper booklet has 22 pages.
6. The candidates, when allowed to open the question paper booklet, must first check the entire booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should IMMEDIATELY bring this fact to the notice of the Invigilation Staff and obtain a new booklet of the same series as given earlier.
7. The serial number of the new Question booklet if issued for some reason should be entered in the relevant column of the OMR. The Invigilation Staff must make necessary corrections in their record regarding the change in the serial no. of Question booklet.
8. The paper consists of total 480 Marks. Each question shall carry 4 marks. There are four options for each question and the candidate has to mark the MOST APPROPRIATE answer on the OMR response sheet.
9. There is negative marking (1 mark for each question) for questions wrongly answered by the candidate.
10. Use of Electronic/Manual Calculator is prohibited.
11. The candidate **MUST READ INSTRUCTIONS BEHIND THE OMR SHEET** before answering the questions and check that two carbon copies attached to the OMR sheet are intact.

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  - a) 50%
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  - a) nitrogen
  - b) oxygen
  - c) carbon dioxide
  - d) Ozone
  
5. A software that hijacks your computer and asks you to pay, in order to get removed
  - a) Key logging
  - b) Trojan
  - c) Encrypting malware
  - d) Ransomware
  
6. The phenomenon on which Optical fiber works is
  - a) Diffraction
  - b) Scattering
  - c) Refraction
  - d) Total internal reflection
  
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  - b) Gobindgarh Fort
  - c) Patalpuri Sarovar
  - d) Ramgarhia Fort

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  - Rock Edit XII
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  - Rock Edit XIV
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  - Pingal
  - Nighantu
  - Nichiketa

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  - 4) It has a range of more than 100 km and travels at a speed of 50 to 140 knots (90 to 260 km/h).

Which of the above statements are correct? Choose the correct option.

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- b) 1, 2 and 3 only
- c) 1, 3 and 4 only
- d) 1, 2, 3 and 4

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  - 2) India’s 6G mission will be in two phases: the first one from 2023 to 2025 and the second one from 2025 to 2030.
  - 3) During Phase 1 Support will be provided to explorative ideas, risky pathways and proof-of-concept tests.
  - 4) During Phase 2, the focus will be on commercialization of the ideas and concepts.
- Which of the above statements are correct? Choose the correct option.

- a) 1, 2 and 3 only
- b) 1, 2 and 4 only
- c) 2, 3 and 4 only
- d) 1, 2, 3 and 4

25. National Institute of Disaster management headquarter is located at

- a) Dehradun
- b) Kolkata
- c) Chennai
- d) New Delhi

26. A ring of narrow growing corals animals of horseshoe shape and crowned with palm trees is called

- a) Algae ridge
- b) Atoll
- c) Patch reef
- d) Coral pinnacle

27. Which one is correct sequence of countries, in decreasing order, in respect of per-capita CO2 emission?
- a) USA-China-Canada
  - b) USA-China-Japan
  - c) USA-China-Germany
  - d) USA-Canada-Japan

28. Consider the following sources of the Indian Constitution.

- (1) Directive Principle of State Policy- Irish Constitution
- (2) Advisory Jurisdiction of the Supreme Court- Canadian Constitution
- (3) Concurrent List –US Constitution
- (4) Parliamentary Privileges- British Constitution

Which of the following is the correct option?

- a) 1, 2 and 4
  - b) 2, 3 and 4
  - c) 1, 3 and 4
  - d) 1, 2 and 3
29. By which Constitutional Amendment Bihar became free from the obligation of having a tribal welfare minister in the state council of ministers?
- a) 84 th Constitutional Amendment
  - b) 94 th Constitutional Amendment
  - c) 104 th Constitutional Amendment
  - d) 74 th Constitutional Amendment
30. Which of the following country has joined NATO in April 2023?
- a) Denmark
  - b) Belgium
  - c) Poland
  - d) Finland
31. Which of the following countries will host the 15<sup>th</sup> BRICS summit?
- a) Brazil
  - b) South Africa
  - c) China
  - d) Russia
32. India's largest Nuclear Power Plant is located in which of the following state?
- a) Tamil Nadu
  - b) Maharashtra
  - c) Uttar Pradesh
  - d) Karnataka



33. The Election Commission recently has launched a year long voter awareness program on All India Radio. What is the name of this program?
- a) Voter junction
  - b) Radio Junction
  - c) Election Junction
  - d) Matadata Junction
34. In which of the following cities the National Climate Conclave 2023 was held?
- a) Hyderabad
  - b) Lucknow
  - c) New Delhi
  - d) Ranchi
35. With reference to the Indian Science Congress ( ISC), which of the following statements is/are correct?
1. 108<sup>th</sup> convention of ISC was held at RTM, Nagpur University
  2. It's theme was " science and Technology for every Nation"
  3. Convention was held in January 2023
- Select the correct answer using the code given below
- a) 1 and 2 only
  - b) 2 and 3 only
  - c) 1 and 3 only
  - d) 1,2 and 3
36. Name the scheme launched by the Ministry of Social Justice and Empowerment for the welfare of the Transgender Community and the beggars?
- a) SMILE
  - b) WINNER
  - c) PROUD
  - d) SPARK
37. The Sixth Edition of the Indian Ocean Conference took place at
- a) New Delhi
  - b) Dhaka
  - c) Beijing
  - d) Naypyidaw
38. Which was the last state of the Kangra group losing its independence to the Sikhs?
- a) Kotlehar
  - b) Guler
  - c) Dattarpur
  - d) Kullu

39. Among which of the regional and sub-regional groups both India and Nepal are not members?

- a) SAARC
- b) BIMSTEC
- c) BBIN
- d) ASEAN

40. Which of the following country has won the ICC Women's World Cup 2022 title?

- a) New Zealand
- b) Australia
- c) England
- d) West Indies

Find the wrong number in following number series:

41. 5, 6, 14, 45, 184, 920, 5556

- a) 5
- b) 6
- c) 14
- d) 920

42. In a certain shop, notebooks that normally sell for Rs. 9 each are on sale at 2 for Rs. 15. How much can be saved by purchasing 10 of these notebooks at the sale price?

- a) Rs.9
- b) Rs.10
- c) Rs.15
- d) Rs.19

43. 6 men take 9 days to complete a piece of work by working for 12 hours a day. Speed of one man is equal to that of 4 children. If the work is to be completed only by children with help of 2 men in 6 days by working for 6 hours a day, then how many children's are required?

- a) 56
- b) 44
- c) 42
- d) 64

44. A boatman goes 8 km against the current of the stream in 2 hour and goes 6 km along the current in 30 minutes. How long will it take to go 12 km in stationary water?

- a) 2 hr 15 min
- b) 1 hr 45 min
- c) 1 hr 30 min
- d) 2 hr

45. On 6<sup>th</sup> Dec, 2007 Thursday falls. What day of the week was it on 9<sup>th</sup> March, 2008?
- Saturday
  - Sunday
  - Monday
  - Tuesday
46. The salary of a person was reduced by 5% .By what percent should his reduced salary be raised so as to bring it at par with his original salary?
- 7.15%
  - 9.05%
  - 6.75%
  - 5.26%
47. In a room of 40 people what is the probability that at least two people have the same birthday?
- 41.1 %
  - 89.1%
  - 11.7%
  - 2.7%
48. A man has 250 gold coins. He wishes to distribute them into bags such that he can pay any sum from 1 to 250 by handing over some bags. What is the minimum number of bags required?
- 8
  - 9
  - 10
  - 7
49. B is the only son of A who is the only daughter of C. E is the mother of F and daughter-in-law of A. How is F related to C?
- Grand Daughter
  - Grandson
  - Grand Grand Daughter
  - Cannot be determined
50. If DELHI is coded as EGOLN, then how is BANGALORE coded in same language?
- CBQKDFRVN
  - CWDPRVKVN
  - CBMHBMQSF
  - CCQKFRVZN

51. 'ਅਨੋਖਾ' ਸ਼ਬਦ ਦੇ ਸਮਾਨਾਰਥਕ ਸ਼ਬਦਾਂ ਦਾ ਸਹੀ ਜੁੱਟ ਚੁਣੋ:
- ਅਸਚਰਜ, ਅਦਭੁੱਤ, ਖਰਾਬ
  - ਅਨੁਪਮ, ਅਦਭੁੱਤ, ਵਚਿੱਤਰ
  - ਵਚਿੱਤਰ, ਬੁਰਾ, ਅਦਭੁੱਤ
  - ਅਦਭੁੱਤ, ਅਲੌਕਿਕ, p/ fw; kb
52. 'ਇੱਕ ਸੱਪ ਦੂਜਾ ਉੱਡਣਾ' ਕਿਸ ਸੰਦਰਭ ਵਿੱਚ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ:
- ਕਰਤਬ ਕਰਨ ਵਾਲਾ ਸੱਪ
  - ਖੰਬਾਂ ਵਾਲਾ ਸੱਪ
  - ਖਤਰਾ ਮੋਲ ਲੈਣਾ
  - ਬਹੁਤ ਖਤਰਨਾਕ ਹੋਣਾ
53. ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ ਦਾ ਸਹੀ ਜੋੜਾ ਚੁਣੋ:
- ਕਟੜ/ਕਟੜ
  - ਪਿੰਡ/ਪਿੰਡ
  - ਓਪਾਏ/ਉਪਾਯ
  - ਸੰਘ/ਸੰਘ
54. 'ਝਗੜਾਲੂ' ਵਿੱਚ ਵਰਤਿਆ ਪਿਛੇਤਰ ਹੈ:
- ਆਲੂ
  - ੜਾਲੂ
  - ਅਲ
  - ਲੂ
55. ਸਹੀ ਜੁੱਟ ਦੱਸੋ:
- ਗੱਭਰੂ/ਤੀਵੀਂ
  - ਸਾਲਾ/ਸਾਲਣੀ
  - ਉੱਲੂ/ਬਤੌਰੀ
  - ਨਵਾਬ/ਮਲਕਾ
56. 56 ਨੂੰ ਪੰਜਾਬੀ ਵਿੱਚ ..... ਕਹਿੰਦੇ ਹਨ:
- ਛੱਪੰਨ
  - ਛਪੰਜੀ
  - ਛਪੰਝਾ
  - ਛਪੰਜਾ

57. ਪੰਜਾਬ ਵਿੱਚ ਕਿਹੜੇ ਪੰਜ ਦਰਿਆ ਵਗਦੇ ਸਨ:

- a) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- b) ਸਤਲੁਜ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ
- c) ਸਰਸਵਤੀ, ਰਾਵੀ, ਬਿਆਸ, ਚਨਾਬ, ਜਮਨਾ
- d) ਸਤਲੁਜ, ਘੱਗਰ, ਬਿਆਸ, ਚਨਾਬ, ਜੇਹਲਮ

58. jgrwvW dI rOSnI dw mylw iks mhIny ivc l`gdw hY?

- a) BwdoN
- b) cyq
- c) P`gx
- d) jyT

59. “ਉੱਠੋ ਤਾਂ ਉੱਠ ਨਹੀਂ.....”।

- a) ਸੁਤਕ ਰਹਿ
- b) ਨੀਂਦ ਦਕ ਮਜਕ ਲੁੱਟ
- c) ਠੂਠਕ ਫੁਟ
- d) ਰੇਤੇ ਦਹ ਮੁੱਠ

60. ‘ਟਕਇਮ ਬਕਉਂਡ’ ਦਕ ਸੁੱਧ ਪੰਜਕਬਹ ਰੂਪ ਲਿਖੇ -

- a) ਮਿਤਹ-ਬੱਧ
- b) ਸਮਾਂ-ਸੂਚਕ
- c) ਮਿਤਹ ਤੋਂ
- d) ਤਕਰਹਖ

61. The general conditions for using “Autoclave” during sterilization of samples in a microbiology laboratory are

- a) Temperature = 121 °C, Pressure = 15 psi
- b) Temperature = 15 °C, Pressure = 121 psi
- c) Temperature = 100 °C, Pressure = 10 psi
- d) Temperature = 121 °C, Pressure = 25 psi

62. During microbial growth, the phase during which microbes are adapted to the environment is called

- a) Exponential Phase
- b) Log Phase
- c) Lag Phase
- d) Stationary Phase

63. Among the following, Fecal indicator bacteria is

- a) *Pseudomonas aeruginosa*
- b) *Bacillus subtilis*
- c) *Salmonella typhi*
- d) *Escherichia coli*

64. Agar-agar used in microbiology laboratory is mainly obtained by
- Golden algae
  - Red algae
  - Yeast
  - Cyanobacteria
65. The poisoning of central nervous system with organic mercurial is known as
- Minamata disease
  - Methamoglobinemia
  - Both of the above
  - None of the above
66. Identify the incorrect statement about carbon isotopes
- C-13 is less abundant in vegetation than in ocean
  - C-12 is most abundant in nature
  - C-14 is absent in fossil fuel
  - C-13 is used for carbon –dating
67. Corona-virus structure is composed of
- outer protein coat and central core of nucleic acid
  - outer nucleic acid and proteinous central core
  - outer proteinous coat and central DNA core
  - outer proteinous coat and central RNA
68. Whenever there is high BOD, DO is less so much that fish cannot survive in lake water because
- Fish utilize all Oxygen
  - Bacteria utilize all Oxygen
  - Algae utilize all oxygen
  - Biological compound are toxic to fish
69. Arsenic problem in India is primarily due to
- Over exploitation of Arsenopyrite in the hinterland
  - Over exploitation of coal in Bihar and West Bengal
  - Over exploitation of groundwater in affected areas
  - Over exploitation of surface water in the affected area
70. When the industry with 'Red' Category is to be established, it is necessary to have a public hearing or inquiry under the procedure called as
- Environmental Health Hazard (EHH)
  - Environmental Litigation (EL)
  - Environmental Management Systems (EMS)
  - Environmental Impact Assessment (EIA)

71. The bacteria responsible for deposition of iron oxide in water pipes is
- Gallionella*
  - Klebsiella*
  - Thermococcus*
  - Helicobacter*
72. Which of the following is true?
- Benzene hexachloride is a non biodegradable pollutant
  - Carbon dioxide is a primary air pollutant
  - Sulphur dioxide causes brown air effect during traffic congestion in cities
  - Anthropogenic air pollutants are natural in origin
- i and ii only
  - ii and iii only
  - i and iv only
  - iii and i only
73. Severe drought is declared if
- Deficit of rainfall is more than 50 percent of the normal
  - Deficit of rainfall varies between 25- 45 percent of the normal
  - Rainfall deficit exceed 25 percent of the normal
  - Rainfall deficit is between 15 -25 percent
74. C<sub>4</sub> plant are commonly found in
- Humid and low temperature environment
  - Arid and hot environment
  - Temperate environment
  - Semi-humid environment
75. Recently implemented UN Sustainable Development Goal (SDG) has how many goals to achieve by 2030?
- 10
  - 17
  - 30
  - None of the above
76. According to IPCC, during the 20<sup>th</sup> century earth's mean surface temperature has risen by approximately
- 0.4<sup>o</sup>C
  - 0.6<sup>o</sup>C
  - 0.8<sup>o</sup>C
  - 1.0<sup>o</sup>C
77. Green Climate Fund (GCF) is established to limit or reduce emission in
- Developing countries
  - NATO member countries
  - Ukraine war effected areas
  - Developed countries

78. The Polluter pay principle was first conceptualized by the
- G 20 countries
  - OECD countries
  - European countries
  - America
79. Which gas is produced from the guts of cattle that is a major greenhouse gas?
- CO<sub>2</sub>
  - CFC
  - Halons
  - Methane
80. Ozone depletion in the Stratosphere may not create which of the following problem in human being?
- Liver disease
  - Anemia
  - Eye Cataracts
  - Skin Cancer
81. Montreal Protocol is a multilateral environmental agreement related to control the Ozone layer depletion was adopted in which year ?
- 1992
  - 1987
  - 1999
  - 2006
82. A current news articles writes “Climate change making Earth uninhabitable...” Guterres warns. Who is Antonio Guterres ?
- Environment Minister of South Africa
  - UN Secretary- General
  - Canadian Environment minister
  - Famous Nobel recipient on Environment
83. “Where there is a risk of severe damage to the environment but absence of any scientific or conclusive proof for the reason , we must stop that activity being safe than sorry”, was given in Rio Declaration of 1992. This is related to
- Green Wash
  - Deep Ecology
  - Precautionary principle
  - Blue risk principle
84. In the Paris Agreement of Climate change, India has taken its pledge that it will reduce the emission intensity of its GDP by 2030 at level of
- 45%
  - 30%
  - 25%
  - 19%



85. Which article of the Indian constitution directs that the State shall endeavour to Protect and improve the environment and to safeguard the forest and wildlife of the country
- 51 A
  - 12 B
  - 48A
  - 8A
86. A developmental project requires both environmental clearance as well as approval under
- Water act, 1974
  - Forest Conservation Act,1980
  - National Environmental Tribunal Act,1995
  - Air Act, 1981
87. According to Environment (Protection) Act,1986 permissible limits of oil and grease in the effluents to be discharged into public sewers is
- 10 mg/ l
  - 20 mg /l
  - 25 mg/ l
  - 30 mg/ l
88. The title of the Brundtland report is
- Caring for Earth
  - Caring of Biosphere
  - Our common Future
  - The Silent space
89. Under the Air Act 1981, which body is empowered to set standard for ambient air quality?
- MoEF &CC
  - State Pollution Control Board
  - Central Pollution Control Board
  - Ministry of Road Transport
90. Access Benefit Sharing (ABS) is an important component in the Environmental legislation of
- FCA 1980
  - Water Act,1974
  - Environment (Protection ) Act 1986
  - Biodiversity Act,2002
91. The Project Snow leopard, was launched in India to safeguard and conserve the high altitude habitat for the animal in the year
- 2015
  - 2005
  - 2011
  - 2009

92. What is the key difference between the Forest (conservation) Act 1980 and Indian Forest Act 1927?
- The Forest (conservation) Act 1980, came in to force to address deforestation, whereas Indian Forest Act 1927 was geared to allow the colonial British administration to control extraction of timber.
  - Tribal people were given more rights in Forest conservation Act,1980 but in IFA,1927 has no power to tribals stay around forest.
  - FCA,1980 focused more of wildlife protection but IFR,1927 was more of Timber protection
  - No one is correct
93. In a frequency distribution, the median and mean is 15 and 12 respectively, find the mode.
- 11
  - 21
  - 41
  - 45
94. What is the difference between Type I and Type II errors in statistical hypothesis testing?
- Type I error occurs when we reject a null hypothesis that is true, while Type II error occurs when we accept a null hypothesis that is false.
  - Type I error occurs when we accept a null hypothesis that is false, while Type II error occurs when we reject a null hypothesis that is true.
  - Type I error occurs when we reject a null hypothesis that is false, while Type II error occurs when we accept a null hypothesis that is true.
  - Type I error occurs when we accept a null hypothesis that is true, while Type II error occurs when we reject a null hypothesis that is false.
95. If the standard deviation of a data is 0.012. Find the variance.
- 0.144
  - 0.00144
  - 0.000144
  - 0.0000144

96. Consider the following unclassified frequency distribution

X:	Frequency
1	8
2	10
3	11
4	16
5	20
6	25
7	15
8	9
9	6

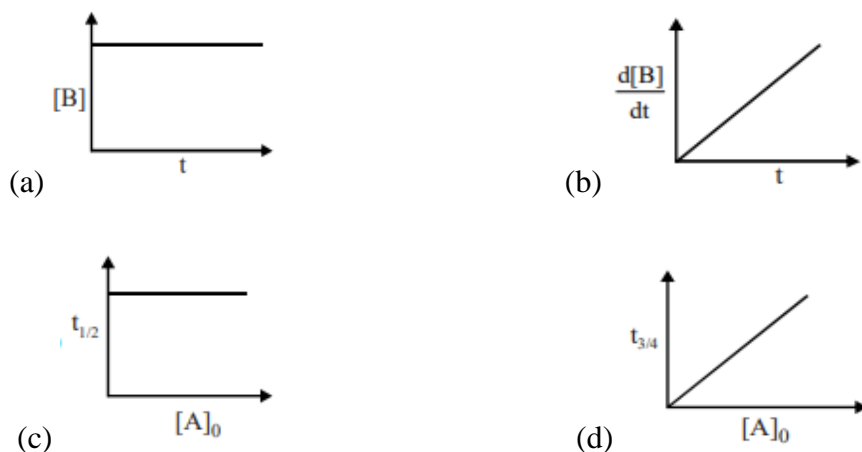
The median of the above given unclassified frequency distribution is

- a) 1
  - b) 2
  - c) 5
  - d) 7
97. If  $y^2 = 4x$  and 0.1% error is incurred for  $y$ , the percentage error involved in  $x$  will be
- a) 0.4
  - b) 0.025
  - c) 0.1
  - d) 0.05
98. In which of the following activities silicon carbide is used?
- a) Making cement and glass
  - b) Disinfecting pond water
  - c) Making casts for statues
  - d) Cutting very hard substances
99. *Lantana camara*– know as Phool Lakhri in local parlance is a shrub found in abundance in Himachal Pradesh. Which of the following statements are correct about it?
- 1.It is a toxic weed and has affected the mountain diversity of the state.
  - 2.Lantana species are widely cultivated for their flowers.
  - 3.It is endemic to India.
  - 4.It is considered as potential fire hazard and it is combustible even when green.
- a) 1 & 3 only
  - b) 2 & 4 only
  - c) 1, 2 & 4 only
  - d) 1, 2, 3 and 4

100. Which article of the CBD states that, “*as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species*”.
- Article 8(d)
  - Article 8(h)
  - Article 9(d)
  - Article 9(h)
101. Which one of the following is not a bio-indicator of water pollution?
- Blood-worms
  - Sludge-worms
  - Sewage fungus
  - Stone flies
102. The accumulation of partially decayed vegetation or organic matter in wet areas results in the formation of
- Moss
  - Peat
  - Coal
  - Fossils
103. Relative contributions of CO<sub>2</sub>, CH<sub>4</sub>, CFCs and N<sub>2</sub>O towards global warming are:
- 50 %, 30 %, 10 %, and 10 % respectively
  - 60%, 20%, 14%, and 6% respectively
  - 40 %, 30%, 20% and 10% respectively
  - 35 %, 15%, 10% and 5% respectively
104. Which one of the following treaty is related to the control of trans-boundary movements of hazardous wastes and their disposal?
- Basel Convention
  - Ramsar Convention
  - Montreal Protocol
  - Cartagena Protocol
105. Which among the following is India’s first state to release a Climate Change Action Plan?
- Himachal Pradesh
  - Delhi
  - Haryana
  - Kerala
106. In context of environment, the term “dirty dozen” refers to
- 12 most harmful greenhouse gases
  - 12 ozone depleting substances
  - 12 persistent organic pollutants
  - 12 acid rain substances

107. \_\_\_\_\_ is caused by careless handling of instruments.
- Systematic Error
  - Random Error
  - Gross Error
  - Fine Error
108. Which of these International agreements was adopted with the objective to ensure access to genetic resources and fair and equitable sharing of benefits arising from their use?
- Cartagena Protocol 2000
  - Nagoya Protocol 2010
  - Paris Agreement 2015
  - Rio Declaration 1992
109. What is the oxidation number of Cr atom in  $K_3CrO_8$ ?
- +2
  - +3.5
  - +5
  - 5.3
110. For which of the following reaction  $\Delta H = \Delta U$ ?
- $H_2(g) + Br_2(g) \rightarrow 2HBr(g)$
  - $C(s) + 2H_2O(g) \rightarrow 2H_2(g) + CO_2(g)$
  - $PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$
  - $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$
111. For an ideal gas at 300K
- $(\frac{\partial U}{\partial V})_T = 0$
  - $(\frac{\partial U}{\partial T})_V = 0$
  - $(\frac{\partial H}{\partial T})_P = 0$
  - $(\frac{\partial G}{\partial T})_P = 0$
112. Which of the following is an example of a polymer used in 3D printing?
- Polylactic acid
  - Bakelite
  - Polyurethane
  - Polyethylene terephthalate

113. Which graph represents zero order reaction  $[A(g) \rightarrow B(g)]$



114. The change in entropy for a reversible adiabatic process is

- a) Maximum                      b) Minimum  
c) zero                              d) positive

115. Match the metal given in Column-A with its medicinal use as a compound in Column-B

Column-A	Column-B
(A) Gd	(I) Cancer
(B) Au	(II) Maniac depression
(C) Pt	(III) MRI contrast agent
(D) Li	(IV) Arthritis

Correct match is

- a) A-II; B-III; C-IV; D-I                      b) A-III; B-IV; C-I; D-II  
c) A-IV; B-II; C-I, D-III                      d) A-I; B-II; C-III; D-IV

116. In which chromatography stationary phase is more polar than mobile phase?

- a) Normal phase chromatography              b) Gas chromatography  
c) Size exclusion chromatography              d) Liquid chromatography

117. In common glass electrode, alkaline error caused at  $pH > 10$  is least for

- a) 0.01M NaCl                      b) 1.0M NaCl  
c) 1.0M LiCl                         d) 1.0M KCl

118. When the intensity of absorption maximum  $E_{\max}$  increases on certain modifications in an organic compound the effect is called

- a) Hypochromic Effect
- b) Hypsochromic Shift
- c) Hyperchromic shift
- d) Chemical Shift

119. Which one of the following statement is false for IR spectroscopy

- a) A conjugation decreases the C=O stretching frequency
- b) Higher the frequency if more strained the acyclic ring containing C=O group
- c) Electron releasing substituents decrease the frequency of C=O bond
- d) Electron withdrawing substituents decrease the frequency of C=O bond

120. Which one of the following is  $C\equiv C$  stretching for internal alkyne?

- a)  $790-840\text{ cm}^{-1}$
- b)  $910-990\text{ cm}^{-1}$
- c)  $2100-2250\text{ cm}^{-1}$
- d)  $3200-3250\text{ cm}^{-1}$

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# **SPACE FOR ROUGH WORK**