PREVIOUS YEAR PAPER

UPPSC LT Grade 2025 Prelims — General Studies and Science (KEZE-04)

UPPSC LT Grade Teacher

118 of the paper's 150 questions · +2 for a correct answer, −0.67 for a wrong one · 120 minutes

Left out of the original paper: 32 (any question that needs a figure, a symbol or formatting we cannot show, or whose text did not read back cleanly from the booklet).

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Questions from the Uttar Pradesh Public Service Commission's paper. Each question is followed by its answer, and the answer key is repeated on the last page.

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General Studies

1. The Buddhist text which describes the names of 16 (Sixteen) Mahajanpadas is known as:

(a) Anguttara Nikaya
(b) Buddhacharita
(c) Lalitavistara
(d) Sutta Nipata

Answer: (a)

2. Which Indian states among the following were th op three performers in the category of Larger States in the State Energy & Climate Index 022)?

(a) Uttar Pradesh, Uttarakhand and Punjab
(b) Uttar Pradesh, Andhra Pradesh and Gujarat
(c) Gujarat, Kerala and Punjab
(d) Madhya Pradesh, Rajasthan and Himachal Pradesh

Answer: (c)

3. Which one of the following is the busiest sea route of the world?

(a) The Southern Atlantic sea route
(b) The South Pacific sea route
(c) The North Pacific sea route
(d) The Northern Atlantic sea route

Answer: (d)

4. Consider the following and arrange them in correct chronological order starting from the earliest to the last:
I. First five year plan in India
II. Implementation of GST in India
III. Starting of Social Banking in India
IV. Establishment of NABARD in India
Select the correct answer from the codes given below:

(a) I, II, IV, III

(b) I, III, II, IV

(c) I, III, IV, II

(d) III, IV, II, I

Answer: (c)

5. If the sides of a triangle are in ratio 3 : 4: 5 and its perimeter is 36 cm, then its area is:

(a) 64 cm^2

(b) 48 cm^2

(c) 54 cm^2

(d) 52 cm^2

Answer: (c)

6. Which one of the following pairs (Subject - Article of the Constitution) is not correctly matched?

(a) Election of the President - Article 53

(b) The President of India - Article 52

(c) Term of office of the President - Article 56

(d) Conditions of the President's office [illegible]

Answer: (a)

7. According to the Final Estimates released by the Department of Agriculture and Farmers' Welfare, what was India's total foodgrain production in 2023 - 24?

(a) 3156.16 lakh metric tonnes

(b) 3296.87 lakh metric tonnes

(c) 3322.98 lakh metric tonnes

(d) 3157.75 lakh metric tonnes

Answer: (c)

8. Consider the following statements with reference to the Delimitation Commission:
I. The orders of the Delimitation Commission cannot be challenged in any court.
II. When the orders of the Delimitation Commission are placed before the Lok Sabha or the State Legislative Assembly, then no amendment can be made in these orders.
Which of the above statements is/are correct?

(a) Both I and II

(b) Only II

(c) Neither I nor II

(d) Only I

Answer: (a)

9. In which of the following substances are the forces of attraction between the particles maximum?

(a) Kerosene oil

(b) Ice

(c) Oxygen

(d) Water

Answer: (b)

10. Match List I with List II and choose the correct answer using the codes given below the lists (with reference to Uttar Pradesh Budget 2025 - 26):
List I (UP Budget 2025 - 26) - List II (In Crore ₹)
A. PM-KUSUM Yojana - i. 650
B. Micro irrigation plan (Per Drop More Crop) - ii. 720
C. National Industrial/Horticulture Mission Yojana - iii. 300
D. Uttar Pradesh Food Processing Industry Policy, 2022 - iv. 509

(a) A-iii, B-iv, C-ii, D-i

(b) A-i, B-ii, C-iii, D-iv

(c) A-iv, B-ii, C-i, D-iii

(d) A-i, B-iii, C-iv, D-ii

Answer: (c)

11. Which one of the following is not true about Jim Corbett National Park, Uttarakhand?

(a) Oldest National Park in India

(b) Largest National Park in India

(c) Home for the endangered Royal Bengal Tige

(d) Located at the Himalaya foothills

Answer: (b)

12. Which Indian city will host the Commonwealth Games 2030?

(a) New Delhi

(b) Mumbai

(c) Ahmedabad

(d) Bhopal

Answer: (c)

13. Consider the following events and arrange them in correct chronological order starting from the earliest to the last activity:
I. A.K. Gopalan vs State of Madras Case
II. Satwant Singh Sawhney vs Assistant Passport Officer, New Delhi Case
III. Maneka Gandhi vs Union of India Case
IV. Hussainara Khatoon vs State of Bihar Case
Select the correct answer from the codes given below:

(a) IV, III, II, I

(b) II, I, III, IV

(c) III, II, I, IV

(d) I, II, III, IV

Answer: (d)

14. Which one of the following pairs (Texts - Subjects) is correctly matched?
I. Tripitaka - Jainism
II. Anguttara Nikaya - Jainism
III. Milinda-Panha - Buddhism
IV. Bhagawati Sutra - Jainism

(a) Only III
(b) Both III and IV
(c) Both I and II
(d) Only IV

Answer: (b)

15. Which of the following Amendment Acts reduced the minimum voting age?

(a) 61st Constitutional Amendment Act
(b) 86th Constitutional Amendment Act
(c) 79th Constitutional Amendment Act
(d) 66th Constitutional Amendment Act

Answer: (a)

16. Which of the following is not a type of unemployment in urban areas?

(a) Industrial unemployment
(b) Seasonal unemployment
(c) Educated unemployment
(d) None of the above

Answer: (b)

17. Who implemented the policy of Sulh-i-kul?

(a) Akbar
(b) Jahangir
(c) Babur
(d) Alauddin Khilji

Answer: (a)

18. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): Leghaemoglobin in nodules of legumes plays an important role in biological nitrogen fixation.
Reason (R): It protects the nitrogen (N2) fixing enzyme, nitrogenase, from oxygen.
Select the correct answer using the options given below.

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).
(b) (A) is true, but (R) is false.
(c) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(d) (A) is false, but (R) is true.

Answer: (a)

19. Which one of the follwing pairs is not correctly matched?

(a) If $a + b = 15$, then $(a - 10)^3 + (b - 5)^3 = 0$

(b) If $a + b = 8$ and $ab = 10$, then $a^3 + b^3 = 272$

(c) If $a + b = 15$ and $ab = 14$, then $a - b = 13$

(d) If $a - b = 4$ and $ab = 2$, then $a^3 - b^3 = 80$

Answer: (d)

20. The Rabatak inscription related to Kanishka is associated with which country?

(a) India

(b) Nepal

(c) Pakistan

(d) Afghanistan

Answer: (d)

21. Which one of the following pairs (Metals or Minerals) is not correctly matched?

(a) Precious metal - Silver

(b) Ferro Alloys - Nickel

(c) Base metal - Cobalt

(d) Non-metallic mineral - Diamond

Answer: (c)

22. The ratio of the radii of two cylinders is 2 : 3 and the ratio of their heights is 5 : 3. What will be the ratio of their curved surfaces?

(a) 7 : 9

(b) 9 : 10

(c) 10 : 9

(d) 20 : 27

Answer: (c)

23. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): Cyclonic conditions are formed in winters when the atmospheric pressure is high and the air temperature is low.
Reason (R): Winter rains lead to anticyclonic conditions with low temperature over North India.
Select the correct answer using the options given below.

(a) (A) is false, but (R) is true.

(b) Both (A) and (R) are true and (R) is the correct explanation of (A).

(c) (A) is true, but (R) is false.

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

Answer: (c)

24. A common example of stem tuber is:

(a) Potato

(b) Onion

(c) Garlic

(d) Ginger

Answer: (a)

25. What was the size of Uttar Pradesh Government Budget in the year 2025 - 26?

(a) ₹ 806736.08 Lakh Crore

(b) ₹ 802736.08 Lakh Crore

(c) ₹ 808736.06 Lakh Crore

(d) ₹ 804736.08 Lakh Crore

Answer: (c)

26. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): In deep sea, water is coloured.
Reason (R): Scattering of light occurs in deep sea.
Select the correct answer using the options given below.

(a) (A) is true, but (R) is false.

(b) (A) is false, but (R) is true.

(c) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(d) Both (A) and (R) are true and (R) is the correct explanation of (A).

Answer: (d)

27. Consider the following statements with reference to tropical evergreen forests:
I. These regions are hot and receive heavy rainfall throughout the year.
II. Hardwood trees like ebony, mahogany are common here.
Which of the above statements is/are correct?

(a) Neither I nor II

(b) Both I and II

(c) Only I

(d) Only II

Answer: (b)

28. Consider the following and arrange them in correct chronological order starting from the earliest to the last:
I. e-Satyapan Yojana
II. Niryat Bandhu Yojana
III. PM Kaushal Vikas Yojana
IV. Government e-MarketPlace (GeM)
Select the correct answer from the codes given below:

(a) III, II, IV, I

(b) II, I, III, IV

(c) I, II, III, IV

(d) II, III, IV, I

Answer: (d)

29. Match List I with List II and choose the correct answer using the codes given below the lists.
List I (National identity) - List II (Zoological/Botanical name)
A. National Bird - i. Ficus benghalensis
B. National Animal - ii. Panthera tigris
C. National Flower - iii. Pavo cristatus
D. National Tree - iv. Nelumbo nucifera

(a) A-iii, B-ii, C-i, D-iv

(b) A-iii, B-ii, C-iv, D-i

(c) A-ii, B-iv, C-iii, D-i

(d) A-i, B-iii, C-ii, D-iv

Answer: (b)

30. Which of the following is not correctly [illegible]

(a) Bhuvankosha - Ksheer Swami

(b) Prabhavak Prashasti - Chandraprabha Suri

(c) Viddhashalabhanjika - Rajashekhara

(d) Prithvirajavijaya - Jayanaka

Answer: (a)

Science

31. A Zener diode is primarily used as a/an:

(a) Rectifier

(b) Current source

(c) Voltage regulator

(d) Amplifier

Answer: (c)

32. Which of the following units is used for short lengths?

(a) Light year

(b) Fermi

(c) Parsec

(d) Astronomical unit

Answer: (b)

33. Match List I with List II and choose the correct answer using the codes given below the lists.
List I - List II
A. Isothermal expansion - i. Work done = 0
B. Isobaric expansion - ii. Internal energy decreases
C. Adiabatic expansion - iii. Internal energy increases
D. Isochoric process - iv. Internal energy constant

(a) A-i, B-ii, C-iii, D-iv

(b) A-ii, B-i, C-iii, D-iv

(c) A-iii, B-iv, C-ii, D-i

(d) A-iv, B-iii, C-ii, D-i

Answer: (d)

34. The retina of a human eye consists of:

(a) Iris

(b) Sensitive neural cells

(c) Cornea

(d) Transparent lens

Answer: (b)

35. Two points P and Q are maintained at potentiaı of 10 V and - 4 V, respectively. The work done in moving 100 electrons from P to Q is:

(a) $- 19.0 \times 10^{-17}$ Joule

(b) 2.24×10^{-16} Joule

(c) 9.60×10^{-17} Joule

(d) $- 2.24 \times 10^{-16}$ Joule

Answer: (b)

38. Which of the following is an incoherent scattering?

(a) Compton scattering

(b) Bragg diffraction in crystal

(c) Rayleigh scattering

(d) Elastic-neutron scattering

Answer: (a)

39. A wire of resistance 4 Ω is used to wind a coil of radius 7 cm. The wire has a diameter of 1.4 mm and the specific resistivity of its material is 2 × 10−7 Ω m. Find the total number of turns in the coil.

(a) 80
(b) 90
(c) 75
(d) 70

Answer: (d)

40. Dynamic resistance of a forward-biased diode is:

(a) Directly proportional to the forward currents
(b) Inversely proportional to the forward currents
(c) Constant at all forward currents
(d) Unaffected by forward currents

Answer: (b)

41. Two statements are given, one marked as Assertion (A) and the other as Reason (R).
Assertion (A): The efficiency of a Carnot engine is always less than 1.
Reason (R): Because sink temperature T2 is always greater than zero.
Select the correct answer using the options given below.

(a) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(b) Both (A) and (R) are true and (R) is the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

Answer: (b)

43. A bullet is fired vertically up from a 400 m[illegible]l tower with a speed of 80 metres/second. If g is taken as 10 metres/second², then the time taken by the bullet to reach the ground will be:

(a) 20 seconds
(b) 8 seconds
(c) 24 seconds
(d) 16 seconds

Answer: (a)

44. The temperature of a gas is increased by 15°C. The corresponding change on Kelvin scale will be:

(a) 288 K
(b) 273 K
(c) 15 K
(d) 25 K

Answer: (c)

45. Match the physical quantities given in List I with the corresponding dimensional formulae given in List II. Choose the correct answer using the codes given below in the lists.
List I (Physical quantities) - List II (Corresponding dimensional formulae)
A. Energy - i. ML^2T^{-3}
B. Force - ii. $ML^{-1}T^{-2}$
C. Power - iii. ML^2T^{-2}
D. Pressure - iv. MLT^{-2}

(a) A-iii, B-iv, C-i, D-ii

(b) A-ii, B-iii, C-iv, D-i

(c) A-iv, B-i, C-ii, D-iii

(d) A-i, B-ii, C-iii, D-iv

Answer: (a)

46. The particle emitted in β-decay together with an electron is:

(a) Neutrino

(b) Photon

(c) Anti-neutrino

(d) Meson

Answer: (a)

47. Match List I with List II and choose the correct answer using the codes given below the lists.
List I (Substance) - List II (Molar specific heat [J mol^{-1} $''^{-1}$] at room temperature and atmospheric pressure)
A. Aluminium - i. 6.1
B. Carbon - ii. 26.5
C. Lead - iii. 25.5
D. Silver - iv. 24.4

(a) A-i, B-iv, C-ii, D-iii

(b) A-iv, B-i, C-ii, D-iii

(c) A-iv, B-i, C-iii, D-ii

(d) A-ii, B-i, C-iv, D-iii

Answer: (b)

48. If 109 electrons move out of a body to enter another body every second, then how much time is required to get a total charge of 1 coulomb on the other body?

(a) ~ 200 years

(b) ~ 20 years

(c) ~ 1 year

(d) ~ 2 years

Answer: (a)

49. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): The temperature coefficient of resistance is positive for metals.
Reason (R): The temperature coefficient of resistance for insulators is also positive.
Select the correct answer using the options given below.

(a) (A) is true, but (R) is false.

(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(c) Both (A) and (R) are true and (R) is the correct explanation of (A).

(d) (A) is false, but (R) is true.

Answer: (a)

53. For a free falling body, the ratio of distances travelled in the first, second and third seconds of its motion will be:

(a) 1:3:5

(b) 9:4:1

(c) 5:3:1

(d) 1:4:9

Answer: (a)

54. The dimensional formula of Stefan's constant is:

(a) $[MT^{-3}K^{-4}]$

(b) $[MT^{3}K^{-4}]$

(c) $[ML^{-1}T^{-3}K^{-4}]$

(d) $[MLT^{-3}K^{-4}]$

Answer: (a)

56. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): Internal energy U is a state function.
Reason (R): Internal energy depends only upon path.
Select the correct answer using the options given below.

(a) (A) is false, but (R) is true.

(b) (A) is true, but (R) is false.

(c) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(d) Both (A) and (R) are true and (R) is the correct explanation of (A).

Answer: (d)

57. Two nicols are oriented with their principal planes making an angle of 30°. What percentage of incident unpolarised light will pass through the system?

(a) 27.5%

(b) 37.5%

(c) 57.5%

(d) 47.5%

Answer: (b)

58. In a hydrogen discharge tube, the number of protons drifting across a cross-section is 1.1×10^{18} per second, while the number of electrons drifting in opposite direction across another cross-section is 3.1×10^{18} per second. Find the current flowing in the tube.

(a) 0.176 A

(b) 0.320 A

(c) 0.672 A

(d) 0.481 A

Answer: (c)

60. A solid sphere having 5.0 cm radius and uniform density is rotating about its diameter. Its radius of gyration is:

(a) 5 cm

(b) 10 cm

(c) $\sqrt{10}$ cm

(d) $\sqrt{5}$ cm

Answer: (c)

61. A heat sink is generally used with a transistor to

(a) Prevent excessive temperature rise

(b) Decrease the forward current

(c) Increase the forward current

(d) Compensate for excessive doping

Answer: (a)

63. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): An ammeter is always connected in series in a circuit.
Reason (R): Ammeter has very low resistance.
Select the correct answer using the options given below.

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) (A) is false, but (R) is true.

(c) (A) is true, but (R) is false.

(d) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

Answer: (d)

64. When Neils Bohr shook hands with Werner Heisenberg, what kind of force was exerted?

(a) Nuclear

(b) Gravitational

(c) Weak

(d) Electromagnetic

Answer: (d)

65. A hero of a stunt film fires 50 g bullets from a machine gun, each at a speed of 1.0 km/s. If he fires 20 bullets in 4 seconds, then he exerts an average force against the machine gun during this period of:

(a) 250 N

(b) 125 N

(c) 25 N

(d) None of the above

Answer: (a)

69. In a stationary sound wave, the pressure variation is:

(a) Maximum at nodes and minimum at antinodes

(b) No pressure variation is observed

(c) Minimum at nodes and maximum at antinodes

(d) Constant everywhere

Answer: (a)

70. Proper mean life time of π^+ mesons travelling with velocity 0.8c is 2.4×10^{-8} second. Its apparent mean life time is:

(a) 4.00×10^{-8} minute

(b) 1.44×10^{-8} minute

(c) 4.00×10^{-8} second

(d) 1.44×10^{-8} second

Answer: (c)

72. What is the decimal equivalent of the b[illegible]er 1101?

(a) 13

(b) 12

(c) 14

(d) 11

Answer: (a)

73. Which of the following statements related to fine structure of sodium D-Line is not correct?

(a) Fine structure is obtained due to transition from energy levels 3p to 3s.

(b) Selection rules for transition are $\Delta L = \pm 1$ and $\Delta J = 0, \pm 1$.

(c) Due to spin orbit interaction, both 3p and 3s energy states split into two energy states.

(d) Sodium D-line belongs to principal series.

Answer: (c)

74. A beam of light is first passed normally through a quarter wave plate and then examined through a rotating Nicol prism. The intensity of the emergent light from Nicol prism shows a variation with minimum intensity zero. Then the given beam of light is:

(a) Elliptically polarized light

(b) Unpolarized light

(c) Circularly polarized light

(d) None of the above

Answer: (c)

75. A sound absorber attenuates the sound level by 20 dB. The intensity decreases by a factor of:

(a) 1000

(b) 10000

(c) 10

(d) 100

Answer: (d)

76. A clear sheet of polaroid is placed on the top of a similar sheet so that their polarizing axes make an angle of 30° with each other. The ratio of the intensity of emerging light to incident unpolarised light is:

(a) 1:3

(b) 1:4

(c) 3:4

(d) 3:8

Answer: (d)

77. A pendulum bob has a speed of 3 m/s wh[illegible]ing through its lowest position. What is its speed when it makes an angle of 60° with the vertical? The length of pendulum is 0.5 m. Take g = 10 m/s².

(a) 4.0 m/s

(b) 2.0 m/s

(c) 3.2 m/s

(d) 4.2 m/s

Answer: (b)

79. When a source of light emitting line spectrum is placed in a magnetic field, then which of the following statements is correct?

(a) Anomalous Zeeman effect requires stronger field than normal Zeeman effect.

(b) In a strong magnetic field, spectral line splits into three components called normal Zeeman effect.

(c) In anomalous Zeeman effect, number of spectral lines decreases.

(d) Paschen-Back effect is not related to magnetic field.

Answer: (b)

80. Which of the following statements is correct?

(a) Both steel and rubber have the same elasticity.

(b) Steel is less elastic than rubber.

(c) Steel is far more elastic than rubber.

(d) Steel is not elastic, but plastic.

Answer: (c)

82. The number of beats produced per second by the vibrations y1 = 10 sin (100 π t) and y2 = 10 sin (108 π t) is:

(a) 2

(b) 4

(c) 8

(d) 6

Answer: (b)

83. Lenz's law is consequence of law of:

(a) Conservation of energy

(b) Conservation of mass

(c) Conservation of charge

(d) Conservation of momentum

Answer: (a)

84. Which of the following gas molecules will have "[illegible] translational" degrees of freedom?

(a) H2

(b) O2

(c) He

(d) N2

Answer: (c)

85. The depression at the free end of a cantilever of length l is δ. The depression at a distance l/4 from the fixed end is:

(a) δ

(b) 0.25 δ

(c) 0.086 δ

(d) 0.86 δ

Answer: (c)

87. A battery of emf 10 volts and internal resistance 3 Ω is connected to a resistor. If the current in the circuit is 0.5 A, what is the resistance of the resistor?

(a) 17 Ω

(b) 14 Ω

(c) 7 Ω

(d) 20 Ω

Answer: (a)

88. Select the correct statement:

(a) The magnitude of average velocity in an interval is equal to its average speed in that interval.

(b) It is possible to have a situation in which the speed of a particle is always zero, but the average speed is not zero.

(c) The magnitude of the velocity of a particle is equal to its speed.

(d) It is possible to have a situation in which the speed of a particle is never zero, but the average speed in an interval is zero.

Answer: (c)

89. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): When two vibrating tuning forks having frequency 256 Hz and 512 Hz are held near each other, beats cannot be heard.
Reason (R): The principle of superposition is valid if the frequencies of the oscillations are nearly equal.
Select the correct answer using the options given below.

(a) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(b) (A) is true, but (R) is false.

(c) (A) is false, but (R) is true.

(d) Both (A) and (R) are true and (R) is the correct explanation of (A).

Answer: (b)

90. Microwaves of wavelength λ = 2.0 cm are incider ormally on a slit that is 5.0 cm wide. What will be the total angular width of the central maximu

(a) 43.2°

(b) 45.2°

(c) 41.2°

(d) 47.2°

Answer: (d)

91. Mg_2C_3 reacts with water forming propyne, C_3^{4-} which has:

(a) 2 sigma and 3 π bonds

(b) 3 sigma and 1 π bonds

(c) 2 sigma and 1 π bonds

(d) 2 sigma and 2 π bonds

Answer: (d)

92. A saturated solution of silver chromate (Ag_2CrO_4) has $[Ag^+] = 5.0 \times 10^{-5}$ M and $[CrO_4^{2-}] = 4.4 \times 10^{-4}$ M. What is the value of Ksp of silver chromate (Ag_2CrO_4)?

(a) 1.5×10^{-4}

(b) 2.5×10^{-6}

(c) 1.1×10^{-12}

(d) None of the above

Answer: (c)

93. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): Most of the synthetic polymers are not biodegradable.
Reason (R): Polymerization process basically induces toxic characters in organic molecules.
Select the correct answer using the options given below.

(a) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(b) (A) is false, but (R) is true.

(c) (A) is true, but (R) is false.

(d) Both (A) and (R) are true and (R) is the correct explanation of (A).

Answer: (a)

94. [Co(NH3)5Cl]SO4 and [Co(NH3)5(SO4)]Cl are:

(a) Geometrical isomers

(b) Ionisation isomers

(c) Coordination isomers

(d) Linkage isomers

Answer: (b)

95. Consider following properties:
I. Pressure
II. Refractive index
III. Specific heat
IV. Energy
Which are intensive properties?

(a) II, III and IV

(b) I, III and IV

(c) I, II, III and IV

(d) I, II and III

Answer: (d)

96. Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).
Assertion (A): Base hydrolysis of 1,2-chlorohydrin gives 1,2-diol with retention of configuration.
Reason (R): The reaction follows SN1 mechanism.
Select the correct answer using the options given below.

(a) (A) is false, but (R) is true.

(b) (A) is true, but (R) is false.

(c) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(d) Both (A) and (R) are true and (R) is the correct explanation of (A).

Answer: (b)

97. Consider the following statements about oxy-acids of phosphorus:
I. H_3PO_4 is a tribasic acid.
II. In H_3PO_3 all the three hydrogen atoms are ionizable.
III. The salts of orthophosphoric acid are used as fertilizers.
Which of the above statements are correct?

(a) I and II

(b) I and III

(c) I, II and III

(d) II and III

Answer: (b)

98. Which of the following pairs is not correctly matched?
(Type of shift) - (Type of Change)

(a) Hyperchromic shift - Increase in molar absorptivity

(b) Red shift - Shift of absorption to longer wavelength

(c) Blue shift - Decrease in absorption intensity

(d) Hypsochromic shift - Decrease in molar absorptivity

Answer: (c)

99. Which of the following compounds will exhibit geometrical isomerism?

(a) 1-phenyl propene

(b) 2, 3-dimethylpent-2-ene

(c) 1-methyl cyclobutanol

(d) Pentan-3-one-oxime

Answer: (a)

100. For an adiabatic process, according to the First Law of Thermodynamics:

(a) $\Delta E = - w$

(b) $\Delta E = q - w$

(c) $\Delta E = w$

(d) None of the above

Answer: (a)

101. Match List I with List II and choose the correct answer using the codes given below the lists.
List I (Hydrides AH_3) - List II (Bond angle)
A. NH_3 - i. 91.8°
B. PH_3 - ii. 91.3°
C. AsH_3 - iii. 107.8°
D. SbH_3 - iv. 93.3°

(a) A-ii, B-iii, C-iv, D-i

(b) A-iii, B-i, C-ii, D-iv

(c) A-iii, B-iv, C-i, D-ii

(d) A-ii, B-i, C-iv, D-iii

Answer: (c)

102. What is correct order of λmax for n → π* transition for R - CN, R - NO2, and R - N = N - R?

(a) R - CN > R - NO2 > R - N = N - R

(b) R - CN > R - NO2 < R - N = N - R

(c) R - CN < R - NO2 < R - N = N - R

(d) R - CN ≡ R - NO2 > R - N = N - R

Answer: (c)

103. When Cl2 gas passes through a concentrated solution of alkali:
I. Cl2 acts as a reducing agent.
II. Cl2 is reduced.
III. Products formed are 5 Cl^-, ClO_3^- and 3 H_2O.
Which of the above statements is/are correct?

(a) I and II

(b) I and III

(c) Only II

(d) II and III

Answer: (d)

104. Consider the following statements with reference to electron affinity:
I. Electron affinity of Be, Mg, Ca and N is practically zero.
II. Electron affinity of F is unexpectedly low.
Which of the above statements is/are correct?

(a) Only I

(b) Neither I nor II

(c) Only II

(d) Both I and II

Answer: (d)

105. Match List I with List II and choose the correct answer using the codes given below the lists.
List I - List II
A. $XeOF_4$ - i. Square pyramidal
B. BF_3 - ii. Trigonal planar
C. ClO_3F - iii. Tetrahedral
D. PCl_5 - iv. Trigonal bipyramidal

(a) A-iv, B-ii, C-i, D-iii

(b) A-i, B-ii, C-iii, D-iv

(c) A-iii, B-ii, C-i, D-iv

(d) A-i, B-iii, C-iv, D-ii

Answer: (b)

107. The reagent used for the distribution between primary, secondary and tertiary alcohol is:

(a) Lucas reagent

(b) Tollen's reagent

(c) Schiff's reagent

(d) Heisenberg's reagent

Answer: (a)

109. Match List I with List II and choose the correct answer using the codes given below the lists.
List I (Molecule) - List II (Shape/Geometry)
A. CS2 - i. Bent
B. H2S - ii. Linear
C. HgX2 - iii. Trigonal pyramidal
D. NH3 - iv. Linear Bent

(a) A-ii, B-i, C-iv, D-iii

(b) A-i, B-ii, C-iii, D-iv

(c) A-ii, B-iv, C-i, D-iii

(d) A-iv, B-iii, C-ii, D-i

Answer: (a)

110. Which of the following is not an aldohexose?

(a) Mannose

(b) Galactose

(c) Glucose

(d) Sorbose

Answer: (d)

111. If energy of first orbit of hydrogen atom is - 2.17 × 10^{-18} J/atom, what is the energy associated with 5th orbit?

(a) - 10.68 × 10^{-20} J/atom

(b) - 6.68 × 10^{-20} J/atom

(c) - 4.68 × 10^{-20} J/atom

(d) - 8.68 × 10^{-20} J/atom

Answer: (d)

114. Match List I with List II and choose the correct answer using the codes given below the lists.
List I - List II
A. Hoffmann Bromamide reaction - i. Betaine
B. Aldol condesation - ii. Dichlorocarbene
C. Reimer-Tiemann reaction - iii. Carbanion
D. Wittig reaction - iv. Nitrene

(a) A-ii, B-iii, C-iv, D-i

(b) A-i, B-iii, C-ii, D-iv

(c) A-iv, B-ii, C-iii, D-i

(d) A-iv, B-iii, C-ii, D-i

Answer: (d)

115. The amount of a radioactive substance which has a decay rate of 3.7 × 10^{10} disintegration/second is called:

(a) 1 Bq (Becquerel)

(b) 1 Ci (Curie)

(c) 1 mol (Mole)

(d) 1 rad (Radian)

Answer: (b)

116. Which of the following is not correctly matched?

(a) Antiproton - Chadwick

(b) Meson - Yukawa

(c) Positron - Anderson

(d) Antineutrino - Fermi

Answer: (a)

117. Which one of the following pairs (Reaction - Unit of rate constant) is not correctly matched?

(a) First order - s^{-1}

(b) Second order - $mol^{-1}\ L\ s^{-1}$

(c) Zero order - $mol^{-1}\ L^{-1}\ s^{-1}$

(d) Third order - $mol^{-2}\ L^{2}\ s^{-1}$

Answer: (c)

118. The pH of the buffer solution of lactic acid + lactate is 4.3. If the concentration of lactic acid and lactate are 0.03 M and 0.073 M respectively, then what is its pKa value?

(a) 3.74

(b) 5.74

(c) 6.74

(d) 4.74

Answer: (a)

119. The emf of a Daniell cell at 298 K is E1:
Zn | ZnSO4(0.01 M) || CuSO4(1.0 M) | Cu
When the concentration of ZnSO4 is 1.0 M and the concentration of CuSO4 is 0.01 M, then the value of emf is E2.
What is the relation between E1 and E2?

(a) E1 > E2

(b) E2 = 0 ≠ E1

(c) E1 = E2

(d) E1 < E2

Answer: (a)

120. Match List I with List II and choose the correct answer using the codes given below the lists.
List I - List II
A. Acetic acid - i. Stephen reaction
B. Sodium phenate - ii. Friedel-Crafts reaction
C. Methyl cyanide - iii. HVZ reaction
D. Toluene - iv. Kolbe's reaction

(a) A-iii, B-iv, C-i, D-ii

(b) A-iii, B-ii, C-i, D-iv

(c) A-i, B-iii, C-iv, D-ii

(d) A-iv, B-i, C-ii, D-iii

Answer: (a)

122. Two statements are given, one marked as Assertion (A) and the other as Reason (R).
Assertion (A): An aqueous solution of ammonium acetate can act as buffer.
Reason (R): Acetic acid is a weak acid and NH4OH is a weak base.
Select the correct answer using the options given below.

(a) Both (A) and (R) are true and (R) is the correct explanation of (A).

(b) Both (A) and (R) are false.

(c) Both (A) and (R) are true, but (R) is not the correct explanation of (A).

(d) (A) is false, but (R) is true.

Answer: (d)

124. Name the reaction:
Amide (Aromatic/Aliphatic/heterocylic) + Alkaline hypohalite (NaOH Solution + Br2/Cl2) → Primary amine + Others

(a) Hoffmann Bromamide reaction

(b) Wittig reaction

(c) Knoevenagel reaction

(d) Cannizzaro reaction

Answer: (a)

125. 1 g H2 gas at STP is expanded so that volume is doubled. Hence, work done is:

(a) 44.8 L atm

(b) 5.6 L atm

(c) 11.2 L atm

(d) 22.4 L atm

Answer: (c)

126. Different spectral series and related regions of spectrum of atomic hydrogen are given below. Which one of the following is not correctly matched?
(Spectral series) - (Region of spectrum)

(a) Lyman - Microwave

(b) Balmer - Visible

(c) Paschen - Infrared

(d) Brackett - Infrared

Answer: (a)

127. The C - H stretching frequency for alkane is 2900 cm^{-1}. The value of C - D stretching frequency is:

(a) 2860 cm^{-1}

(b) 2900 cm^{-1}

(c) 2060 cm^{-1}

(d) 2250 cm^{-1}

Answer: (c)

129. Glucose on oxidation with Br2 / H2O gives:

(a) Levulinic acid

(b) Glucaric acid

(c) Sorbitol

(d) Gluconic acid

Answer: (d)

131. The addition of a small amount of Argon gas at a constant volume will not affect the equilibrium of which of the following reactions?

(a) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$

(b) $H_2(g) + I_2(g) \rightleftharpoons 2HI$

(c) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

(d) The equilibrium will remain unaffected in all three cases

Answer: (d)

132. Oxidation number of Potassium in Potassium Superoxide (KO_2) is:

(a) +4

(b) +2

(c) 0

(d) +1

Answer: (d)

133. Match List I with List II and choose the correct answer using the codes given below the lists.
List I - List II
A. Wittig reaction - i. Aldehydes without α-hydrogen
B. Knoevenagel reaction - ii. Aldehydes with α-hydrogen
C. Aldol condensation - iii. Phosphorus ylides
D. Cannizzaro reaction - iv. Reaction with active methylene compounds of ketones

(a) A-i, B-ii, C-iv, D-iii

(b) A-iii, B-iv, C-i, D-ii

(c) A-iii, B-iv, C-ii, D-i

(d) A-ii, B-iii, C-i, D-iv

Answer: (c)

137. The half-life period of a radioactive isotope is 100 years. In how many years will its amount be 1/8th of the initial value?

(a) 500

(b) 100

(c) 50

(d) 300

Answer: (d)

138. Which of the following has minimum bond length?

(a) O_2^+

(b) O_2

(c) O_2^{2-}

(d) O_2^-

Answer: (a)

141. Match List I with List II and choose the correct answer using the codes given below the lists.
List I - List II
A. Bakelite - i. Paints
B. Teflon - ii. Photograph records
C. Melamine - iii. Unbreakable crockery
D. Novolac - iv. Non-stick coated utensils

(a) A-iv, B-i, C-ii, D-iii

(b) A-iii, B-ii, C-i, D-iv

(c) A-i, B-iii, C-iv, D-ii

(d) A-ii, B-iv, C-iii, D-i

Answer: (d)

143. Which of the following compounds exhibit optical isomerism?

(a) Nitromethane

(b) Biphenyl

(c) Glyceraldehyde

(d) Ethylene glycol

Answer: (c)

144. Which of the following pairs are correctly matched?
(Process) - (Catalyst used)
I. Haber's process for the manaufacture of NH_3 - Finely divided Fe, Mo
II. Decon's process for the manufacture of chlorine - Cu_2Cl_2
III. Contact process for the manufacture of H_2SO_4 - ZnO + Al_2O_3
IV. Ostwald process for the manufacture of HNO_3 - Pt-Gauze

(a) I, II and III

(b) I, II and IV

(c) I, III and IV

(d) II, III and IV

Answer: (b)

145. Match List I with List II and choose the correct answer using the codes given below the lists.
List I (Complex Ion) - List II (Number of unpaired electrons)
A. $[Fe(CN)6]4-$ - i. 2
B. $[FeF6]^{3-}$ - ii. 0
C. $[Fe(CN)6]^{3-}$ - iii. 1
D. $[Ni(NH3)6]^{2+}$ - iv. 5

(a) A-ii, B-iv, C-iii, D-i

(b) A-ii, B-i, C-iv, D-iii

(c) A-i, B-ii, C-iii, D-iv

(d) A-i, B-iv, C-iii, D-ii

Answer: (a)

146. Match List I with List II and choose the correct answer using the codes given below the lists.
List I (Complex) - List II (Hybridization)
A. $[NiCl4]^{2-}$ - i. sp^3d^2
B. $[Ni(CN)4]^{2-}$ - ii. dsp^2
C. $[CoF6]^{3-}$ - iii. sp^3
D. $[Co(en)3]^{3+}$ - iv. d^2sp^3

(a) A-iii, B-ii, C-i, D-iv

(b) A-iii, B-ii, C-iv, D-i

(c) A-ii, B-iii, C-iv, D-i

(d) A-ii, B-iii, C-i, D-iv

Answer: (a)

147. The number of unpaired electrons in $NiCl4^{2-}$ (T ahedral) are:

(a) One

(b) Zero

(c) Two

(d) Four

Answer: (c)

148. The number of asymmetric carbon atoms in α-D-glucopyranose molecule is:

(a) 4

(b) 3

(c) 5

(d) 2

Answer: (c)

Answer key

Answer key from the Uttar Pradesh Public Service Commission's official answer key for this sitting. "—" means the key gave none.

General Studies

1	**(a)**	2	**(c)**	3	**(d)**	4	**(c)**	5	**(c)**	6	**(a)**	7	**(c)**	8	**(a)**
9	**(b)**	10	**(c)**	11	**(b)**	12	**(c)**	13	**(d)**	14	**(b)**	15	**(a)**	16	**(b)**
17	**(a)**	18	**(a)**	19	**(d)**	20	**(d)**	21	**(c)**	22	**(c)**	23	**(c)**	24	**(a)**
25	**(c)**	26	**(d)**	27	**(b)**	28	**(d)**	29	**(b)**	30	**(a)**				

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31	**(c)**	32	**(b)**	33	**(d)**	34	**(b)**	35	**(b)**	38	**(a)**	39	**(d)**	40	**(b)**
41	**(b)**	43	**(a)**	44	**(c)**	45	**(a)**	46	**(a)**	47	**(b)**	48	**(a)**	49	**(a)**
53	**(a)**	54	**(a)**	56	**(d)**	57	**(b)**	58	**(c)**	60	**(c)**	61	**(a)**	63	**(d)**
64	**(d)**	65	**(a)**	69	**(a)**	70	**(c)**	72	**(a)**	73	**(c)**	74	**(c)**	75	**(d)**
76	**(d)**	77	**(b)**	79	**(b)**	80	**(c)**	82	**(b)**	83	**(a)**	84	**(c)**	85	**(c)**
87	**(a)**	88	**(c)**	89	**(b)**	90	**(d)**	91	**(d)**	92	**(c)**	93	**(a)**	94	**(b)**
95	**(d)**	96	**(b)**	97	**(b)**	98	**(c)**	99	**(a)**	100	**(a)**	101	**(c)**	102	**(c)**
103	**(d)**	104	**(d)**	105	**(b)**	107	**(a)**	109	**(a)**	110	**(d)**	111	**(d)**	114	**(d)**
115	**(b)**	116	**(a)**	117	**(c)**	118	**(a)**	119	**(a)**	120	**(a)**	122	**(d)**	124	**(a)**
125	**(c)**	126	**(a)**	127	**(c)**	129	**(d)**	13	**(d)**	132	**(d)**	133	**(c)**	137	**(d)**
138	**(a)**	141	**(d)**	143	**(c)**	144	**(b)**	1	**(a)**	146	**(a)**	147	**(c)**	148	**(c)**