QP Series Code : **AA**

অসম দক্ষতা বিশ্ববিদ্যালয়

ASSAM SKILL UNIVERSITY
(A Govt of Assam University)

Assam Skill University Entrance Examinations 2026
B.Tech. and Food Tech. Program (Common paper)
PHYSICS AND CHEMISTRY (Paper No. : 01)

Full Marks : 30 + 30 = 60 Time : 40+40=80 minutes

Total number of pages in this booklet : 12

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE INSTRUCTED

All candidates are required to read the instructions given below, before starting to write the answers. Ensure to write your ROLL CODE AND ROLL NUMBER AT THE BOTTOM OF THIS PAGE.

Instructions

1. Candidate should keep his/her admit card on the table with his/her latest photograph pasted on it.
2. There are two parts in this Question Paper. **PART-A**, with 30 numbers of MCQs consisting Questions from Physics and **PART-B** consists of 30 questions (MCQs) from Chemistry. All questions are compulsory.
3. Each question carries 1 mark. There is no negative marking. **Full marks : 60**.
4. The answers are to be given by making proper marking on the OMR with ball point Black pen only.
5. No loose sheet is allowed. Rough work, if required, may be done on the blank pages at the end of this question paper.
6. Talking with any other candidate inside the examination hall may lead to disqualification of the candidate.
7. **OMRs must be signed by the candidate and the invigilator**. **The candidate has to ensure the same, because lack of these signatures will lead to cancellation of the OMR.**
8. Candidate has to put his/her signature on the attendance sheet. **No candidate is allowed to leave the examination hall before completion of 1 (one) hour from the commencement of examination.**
9. Candidate needs to check the Question booklet after instructed by the invigilator and report if any discrepancies are noticed in the booklet regarding number of pages or damaged pages.
10. **Marking in more than one option against any question on the OMR will cancel that answer**. Instructions are given on the reverse of the OMRs.
11. **Write the Correct Roll Code on the concerned OMR.**
12. Handover the Question Paper and the OMR to the invigilator before leaving the exam hall.

Roll Code : | | | | Roll Number : | | | | | | | |

Sl. No. of the OMR : | | | | | | | | Signature of the candidate:.....

SECTION–A

Physics

1. A simple harmonic progressive wave travelling along the positive x-axis is represented as

(A) A $sin\omega t$ (B) A $sin\omega t\ cos\omega t$

(C) A $sin(\omega t - kx)$ (D) A $sin(\omega t + kx)$

2. A rain drop of radius 0.3 *mm* falls through air with a terminal velocity of 1 m/s. The viscosity of air is $18\times10^{-}5$ poise. Find the viscous force on the rain drop.

(A) 2.32×10^{-3} dyne (B) 1.55×10^{-3} dyne

(C) 2.63×10^{-2} dyne (D) 1.01×10^{-2} dyne

3. A force acts on a particle of mass 3 *gm* in such a way that the position of the particle as a function of time is given by $x = 3t - 4t^2 + t^3$ where x is in meters and t is in seconds. The work done during the first 4 seconds is

(A) 570 *mJ* (B) 450 *mJ*

(C) 490 *mJ* (D) 528 *mJ*

4. The percentage error in measuring the sides of a cube is 2%. The percentage error in its volume is:

(A) 2% (B) 4%

(C) 6% (D) 8%

5. A lift moving upward with acceleration a. The apparent weight of a body becomes:

(A) $m(g-a)$ (B) mg

(C) $m(g+a)$ (D) Zero

6. The speed of transverse waves on a stretched string depends upon:

(A) Length only (B) Tension and linear density

(C) Frequency only (D) Amplitude only

7. Drift velocity of electrons in a conductor is of the order:

(A) $10^8\ m/s$ (B) $10^5\ m/s$

(C) $10^{-4}\ m/s$ (D) $10^2\ m/s$

8. In photoelectric effect, stopping potential depends upon:

(A) Intensity of light (B) Frequency of light

(C) Distance from source (D) Area of metal surface

9. An ideal gas expands adiabatically. During expansion:

(A) Temperature rises (B) Temperature falls

(C) Pressure remains constant (D) Internal energy increases

10. Two sound waves of frequencies 256 *Hz* and 260 *Hz* produce beats. Number of beats per second:

(A) 2 (B) 4

(C) 8 (D) 16

11. An object is placed in air at 30 *cm* from a convex spherical surface of radius 20 *cm* separating air ($n = 1$) and glass ($n = 1.5$). Image distance is:

(A) 180 *cm* (B) 90 *cm*

(C) 60 *cm* (D) 45 *cm*

12. For a prism of angle 60° and refractive index $\sqrt{3}$, the minimum deviation is:

(A) 30° (B) 45°

(C) 60° (D) 90°

13. A coil of 200 turns experiences a change in magnetic flux from 5×10^{-3} *Wb* to zero in 0.1s. Induced emf is:

(A) 2 *V* (B) 5 *V*

(C) 10 *V* (D) 20 *V*

14. Eddy currents are minimized in transformers by:

(A) Using copper core (B) Laminating the core

(C) Increasing number of turns (D) Cooling the core

15. The peak value of AC voltage is 311*V*. RMS voltage is:

(A) 110 *V* (B) 155 *V*

(C) 220 *V* (D) 311 *V*

16. Wattless current exists in:

(A) Pure resistive circuit (B) Pure inductive circuit

(C) DC circuit only (D) Semiconductor diode

17. Which electromagnetic wave has highest penetrating power?

(A) Infrared (B) Ultraviolet

(C) X-rays (D) Gamma rays

18. If the unit of length, mass and time each be doubled, the unit of work is increased by

(A) 2 times (B) 4 times

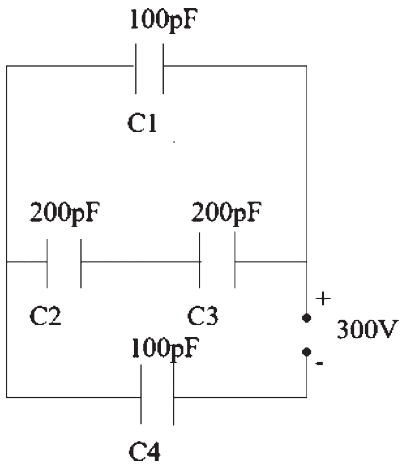
(C) 6 times (D) No change

19. Consider N resistors each with resistance R. If the ratio between highest value and the lowest value of resistance that can be obtained by combining these resistors is equal to 289, then find the value of N.

(A) 289 (B) 145

(C) 17 (D) None of these

20. Obtain the equivalent capacitance of the network shown in the figure given below :



(A) $\frac{200}{3}\ pF$ (B) $\frac{100}{3}\ pF$

(C) $100\ pF$ (D) $\frac{400}{3}\ pF$

21. A square of side L meter lies in the x-y plane in a region where the magnetic field is given by $B = B_0\left(2\hat{i} + 3\hat{j} + 4\hat{k}\right) Tesla$, where B_0 is constant. Find the magnitude of flux passing through the square.

(A) $2B_0L^2$ (B) $4B_0L^2$

(C) B_0L^2 (D) $6B_0L^2$

22. A block of mass 10 kg is kept on a horizontal table. Find thrust on the table an pressure if the contact area = 0.02 m^2. (Given, g = 10 m/s^2)

(A) 100N, 5000N/m^2 (B) 200N, 5000N/m^2

(C) 500N, 1000N/m^2 (D) 200N, 1000N/m^2

23. What is the parallax error in a Vernier calliper?

(A) An error caused by the zero marks of the two scales not aligning

(B) An error caused by improper alignment of the eye when taking a reading

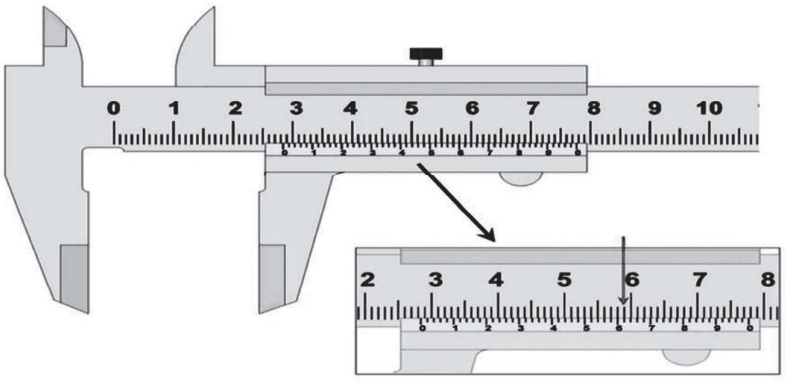
(C) An error caused by the wear and tear of the jaws

(D) A temperature-induced expansion of the metal

24. Find the value in the following Vernier scale

(A) 2.86 cm (B) 2.5 cm

(C) 2.8 cm (D) 2.3 cm



25. For a system undergoing a cyclic process, the net work done is:

(A) Equal to change in internal energy

(B) Zero

(C) Equal to heat absorbed in one step only

(D) Equal to entropy change

26. A full-wave rectifier has efficiency approximately:

(A) 40% (B) 50%

(C) 81% (D) 100%

27. Zener diode works in:

(A) Forward bias only

(B) Reverse breakdown region

(C) Cut-off region

(D) Both forward and reverse without breakdown

28. Ampere's circuital law states:

(A) $\oint E^{\rightarrow} . dl^{\rightarrow} = 0$ (B) $\oint B^{\rightarrow} . dl^{\rightarrow} = \mu_0 l$

(C) $\oint B^{\rightarrow} . dA^{\rightarrow} = 0$ (D) $\oint E^{\rightarrow} . dA^{\rightarrow} = Q/\varepsilon_0$

29. The slope of a velocity–time graph represents:

(A) Displacement (B) Acceleration

(C) Jerk (D) Momentum

30. Angle of friction is related to coefficient of friction by:

(A) $\mu = tan\,\theta$ (B) $\mu = sin\,\theta$

(C) $\mu = cos\,\theta$ (D) $\mu = 1/tan\,\theta$

Chemistry

31. Which one of the following has maximum number of atoms?

(A) 1 g of Ag (s) [Atomic mass of Ag =108]

(B) 1 g of Mg (s) [Atomic mass of Mg =24]

(C) 1 g of O_2 (g) [Atomic mass of O =16]

(D) 1 g of Li (s) [Atomic mass of Li =7]

32. Calculate the molarity of 63% w/w HNO_3 solution if density is 1.4 g/mL

(A) 12 M (B) 14 M

(C) 8 M (D) 10 M

33. Which of the following sets of quantum numbers represents the highest energy of an atom?

(A) $n = 3, l = 0, m = 0, s = +1/2$ (B) $n = 3, l = 1, m = 1, s = +1/2$

(C) $n = 3, l = 2, m = 1, s = +1/2$ (D) $n = 4, l = 0, m = 0, s = +1/2$

34. If radius of second Bohr orbit of He^+ ion is 105.8 pm. What is the radius of third Bohr orbit of Li^{2+} ion?

(A) 158.7 pm (B) 15.87 pm

(C) 1.587 pm (D) 158.7 pm

35. Which of the following are isoelectronic species?

(A) Ca^{2+}, K^+ and Zn^{2+} (B) Mn^{2+}, Fe^{2+} and Ni^{2+}

(C) Na^+, Al^{3+} and Ne (D) Sc, Co^{2+} and Cu^{2+}

36. Which of the following groups contain metal, non-metals and metalloids?

(A) Group 17 (B) Group 14

(C) Group 13 (D) Group 12

37. The 1st ionization energy of Na, Mg, Al and Si are in the order

(A) $Na<Mg>Al<Si$ (B) $Na>Mg>Al>Si$

(C) $Na<Mg<Al<Si$ (D) $Na>Mg>Al<Si$

38. Among halogens, the correct order of amount of energy released in electron gain enthalpy (electron affinity) is

(A) $F>Cl>Br>I$ (B) $F<Cl>Br>I$

(C) $F<Cl<Br<I$ (D) $F<Cl
I$

39. Amongst the following which one will have maximum lone pair-lone pair electron repulsion?

(A) ClF_3 (B) IF_5

(C) SF_4 (D) XeF_2

40. Consider the following species: CN^+, CN^-, NO and CN. Which one of these will have the highest bond order?

(A) CN^- (B) CN^+

(C) CN (D) NO

41. Which of the following transition metal ion has highest magnetic moment?

(A) Cu^{2+} (B) Ni^{2+}

(C) Co^{2+} (D) Fe^{2+}

42. Which of the following transition metal ions is colourless?

(A) V^{2+} (B) Cr^{3+}

(C) Zn^{2+} (D) Ti^{3+}

43. Which of the following is a basic amino acid?

(A) Serine (B) Alanine

(C) Tyrosine (D) Lysine

44. Find the set of parameters that represents path function, among the following (i) to (iv) : (i) q+w; (ii) q; (iii) w; (iv) H-TS, where q-(heat) and w-(work) and H-TS is Gibb's Function

(A) (ii) and (iii) (B) (i) and (iv)

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

45. The total entropy change (ΔS) for the system and surrounding of a spontaneous process is given by

(A) $\Delta S_{total} = \Delta S_{system} + \Delta S_{surr} > 0$ (B) $\Delta S_{total} = \Delta S_{system} + \Delta S_{surr} < 0$

(C) $\Delta S_{system} = \Delta S_{total} + \Delta S_{surr} > 0$ (D) $\Delta S_{surr} = \Delta S_{total} + \Delta S_{system} < 0$

46. Which of the following relationship is not correct for the relation between ΔH and ΔU?

(A) when $\Delta n_g = 0$ then $\Delta H = \Delta U$ (B) when $\Delta n_g > 0$ then $\Delta H > \Delta U$

(C) when $\Delta n_g < 0$ then $\Delta H < \Delta U$ (D) when $\Delta n_g RT = 0$ then $\Delta H < \Delta U$

47. The work done during expansion of a gas from 4 dm^3 to 6 dm^3 against a constant external pressure of 3 atm is ($1L$ atm=$101.32J$)

(A) $-6\ J$ (B) $-608\ J$

(C) $+304\ J$ (D) $-304\ J$

48. The molality of 648 g of pure water is

(A) 36 m (B) 55.5 m

(C) 3.6 m (D) 5.55 m

49. The system that forms maximum boiling azeotrope is

(A) acetone-chloroform (B) ethanol-acetone

(C) n-hexane-n-heptane (D) carbon disulphide-acetone

50. 2 g of sugar is added to one litre of water to give sugar solution. What is the effect of addition of sugar on the boiling point and freezing point of water?

(A) Both boiling point and freezing point increase.

(B) Both boiling point and freezing point decrease.

(C) Boiling point increase and freezing point decreases.

(D) Boiling point decreases and freezing point increases.

51. Which of the following is dependent on temperature?

(A) Molarity (B) Mole fraction

(C) Weight percentage (D) Molality

52. Which of the following will have same value of Van't Hoff as that of $K_4\left[Fe(CN)_6\right]$?

(A) $Al_2(SO_4)_3$ (B) $AlCl_3$

(C) $Al(NO_3)_3$ (D) $Al(OH)_3$

53. Which of the following compound cannot act as Lewis base?

(A) SF_4 (B) PCl_5

(C) ClF_3 (D) NF_3

54. Which of the following cannot act both as Bronsted acid and as Bronsted Base?

(A) HCO_3^- (B) NH_3

(C) HCl (D) HSO_4^-

55. The pH of solution containing 50 *mL* each of 0.10M sodium acetate and 0.01 *M* acetic acid is [Given: p^{Ka} of CH_3COOH = 4.57]

(A) 5.57 (B) 3.57

(C) 4.57 (D) 2.57

56. For the reaction: $2NO_2(g) \rightleftharpoons N_2O_4(g)$ Kp/Kc is equal to :

(A) $1/RT$ (B) $(RT)^{1/2}$

(C) RT (D) $(RT)^2$

57. Oxidation number of Cr in $Na_2Cr_2O_7$ is

(A) +4 (B) +2

(C) +6 (D) +8

58. Kohlrausch's law is applicable

(A) for concentrated solution

(B) at infinite dilution

(C) for concentrated as well as dilute solutions

(D) None of the above

59. Which of the following reagents cannot be used to oxidise primary alcohol to aldehyde?

(A) CrO_3 in anhydrous medium (B) $KMnO_4$ in acidic medium

(C) Pyridinium chlorochromate (D) Heat in presence of Cu at 573 K

60. Strongest base among the following is

(A) $C_6H_5NH_2$ (B) p–NO_2–$C_6H_4NH_2$

(C) m–NO_2–$C_6H_4NH_2$ (D) $C_6H_5CH_2NH_2$

SPACE FOR ROUGH WORK (IF REQUIRED)