Sample Paper

MEDICAL

Aakash
Medical | IIT-JEE | Foundations

Aakash
NATIONAL
TALENT HUNT EXAM
2025
KASHMIR
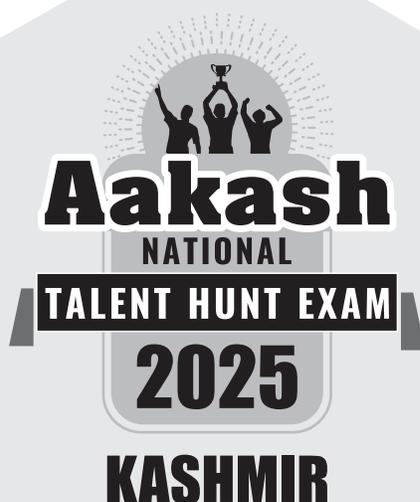
(Class XII Studying Moving to XII Passed)

Physics, Chemistry & Biology

INSTRUCTIONS FOR CANDIDATE

1. Duration of Test is 1 hr.

2. The Test Booklet consists of **40** questions. The maximum marks are **90**. There is **no negative marking** for wrong answer.

3. Pattern of the questions are as under:

   (i)   The question paper consists of three parts *i.e.*, **Physics, Chemistry** and **Biology**. Each part has **two sections**.

   (ii) **Section-I:** This section contains **35** multiple choice questions, which have **only one** correct answer. Each question carries **+2 marks** for correct answer.

   (iii) **Section-II:** This section contains **5** multiple choice questions, in which **one or more than one** choice(s) is(are) correct. Each question carries **+4 marks** for correct answer.

Aakash National Talent Hunt Exam (Kashmir)-2025
Sample Paper
(*Class XII Studying Moving to XII Passed*)

> (The questions given in sample paper are indicative of the level and pattern of questions that will be asked in ANTHE (Kashmir)-2025)

Time : 1 Hour   **MM : 90**

PHYSICS

SECTION-I : SINGLE CORRECT ANSWER TYPE

This section contains 9 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** choice is correct.

1. An electric dipole with dipole moment $\vec{p} = \left(5\hat{i} + \hat{j} - 2\hat{k}\right) \times 10^{-7}$ C m is placed in an electric field $\vec{E} = \left(10\hat{i} + 2\hat{j} - 4\hat{k}\right)$ V/m. The torque experienced by the dipole will be

   (1) 44 N m   (2) 48 N m

   (3) 35 N m   (4) Zero

2. On the *x*-axis at points $x = 2$ m, 4 m, 8 m, ... there are infinite number of charged particle each of charge 10 μC are placed. The magnitude of electric field at the origin is

   (1) 9×10^9 N/C   (2) 18×10^6 N/C

   (3) 3×10^4 N/C   (4) 18×10^7 N/C

3. In the given circuit, a potential difference of 60 V is applied across *AB*. The potential difference between points *M* and *N* is
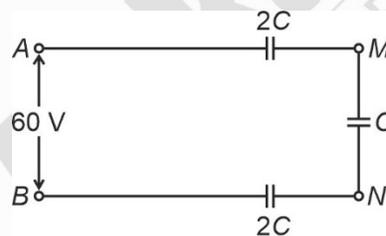

   (1) 10 V   (2) 15 V

   (3) 20 V   (4) 30 V

4. A solenoid has a core of a material with relative permeability of 200. The windings of solenoid are insulated from the core and carry a current of 4 A. If the number of turns is 1000 per meter, then the net magnetic field in the solenoid is nearly

   (1) 0.5 T   (2) 1.0 T

   (3) 1.5 T   (4) 2 T

5. The magnetic dipole moment of current carrying loop as shown in figure is
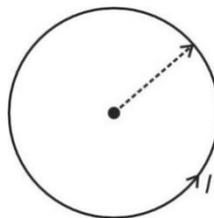
   (1) $\pi I R^2$ inward   (2) $\pi I R^2$ outward

   (3) $2\pi I R^2$ inward   (4) $2\pi I R^2$ outward

6. In the circuit given below, the value of effective resistance between *A* and *B* will be
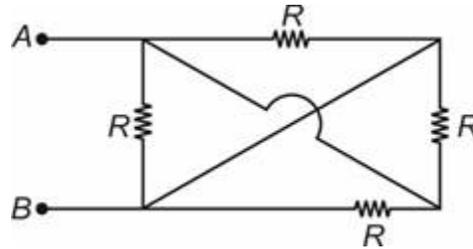
(1) $\dfrac{R}{2}$

(2) $\dfrac{R}{4}$

(3) $2R$

(4) $3R$

7. A current in a circuit as a function of time is shown in figure. The average value of current for time interval $t = 0$ to $t = T$, will be (Current is given by $I = 10\sin\left(\dfrac{2\pi t}{T}\right)$)
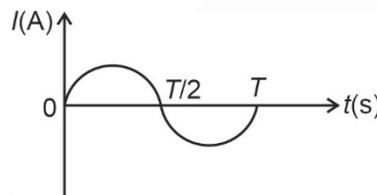
(1) 10 A

(2) $\dfrac{10}{\sqrt{2}}$ A

(3) $10\sqrt{2}$ A

(4) Zero

8. The figure shows a long current carrying wire and a square loop which is moving with constant velocity *v* as shown in the figure. The direction of induced current in the loop will be
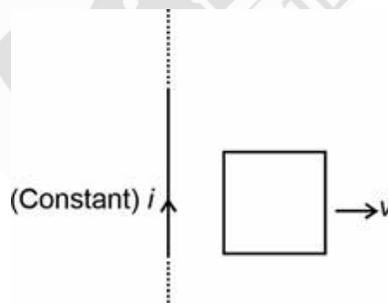

(1) Anticlockwise

(2) Clockwise

(3) First clockwise and then anticlockwise

(4) No current induced in loop

9. A 11 Ω resistor is connected to a 220 V, 50 Hz ac supply. The rms value of current in the circuit is

(1) 10 A

(2) $20\sqrt{2}$ A

(3) 20 A

(4) $10\sqrt{2}$ A

SECTION-II : ONE OR MORE THAN ONE CORRECT ANSWER TYPE

This section contains 1 multiple choice question, which has 4 choices (1), (2), (3) and (4) out of which **ONE OR MORE THAN ONE** choice(s) is(are) correct.

10. Three point charges are placed at the corner of an equilateral triangle as shown. Then,
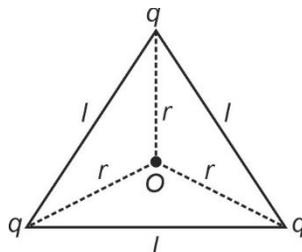
(1) Electric potential at centroid of triangle is $\dfrac{3kq}{r}$

(2) Magnitude of electric field at centroid of triangle is zero

(3) Potential energy of system is zero

(4) Potential energy of system is non-zero

CHEMISTRY

SECTION-I : SINGLE CORRECT ANSWER TYPE

This section contains 9 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** choice is correct.

11. 99% of a first order reaction gets completed in 32 minutes. Time required for 99.9% completion is
    (1) 50 minutes
    (2) 46 minutes
    (3) 48 minutes
    (4) 64 minutes

12. Which of the following is correct for a solution showing positive deviation from ideal behaviour?
    (1) $\Delta H_{mix} < 0$
    (2) $\Delta G_{mix} > 0$
    (3) $\Delta V_{mix} > 0$
    (4) $\Delta S_{mix} < 0$

13. For a chemical reaction, the rate law is

    Rate = $k[X]^3$

    If the concentration of X is tripled, then the rate of reaction will become
    (1) 9 times
    (2) 27 times
    (3) 6 times
    (4) 3 times

14. Mass of silver deposited at cathode by passage of 9.65 A current for 1000 seconds is (Atomic mass of Ag = 108 u)
    (1) 27 g
    (2) 54 g
    (3) 10.8 g
    (4) 21.6 g

15. Standard electrode potential for Sn^{4+}/Sn^{2+} couple is +0.15 V and that for the Cr^{3+}/Cr couple is –0.74 V. These two couples in their standard state are connected to make a cell. The cell potential will be
    (1) +1.83 V
    (2) +1.19 V
    (3) +0.89 V
    (4) +0.18 V

16. The vapour pressure of a pure liquid 'A' is 40 mm of Hg at 25°C. It forms an ideal solution with another liquid B. The mole fraction of B is 0.4 and total vapour pressure of the solution is 70 mm of Hg. So, the vapour pressure of pure liquid, B at the same temperature is

   (1) 115 mm of Hg
   (2) 80 mm of Hg
   (3) 90 mm of Hg
   (4) 125 mm of Hg

17. Diamagnetic complex among the following is

   (1) $K_3[Mn(CN)_6]$
   (2) $[Co(NH_3)_6]Cl_3$
   (3) $K_3[Fe(CN)_6]$
   (4) $K_3[MnCl_6]$

18. IUPAC name of $Fe_4[Fe(CN)_6]_3$ is

   (1) Ferrous ferric cyanide
   (2) Ferric ferrous hexacyanate
   (3) Iron (III) hexacyanidoferrate (II)
   (4) Ferrous hexacyanidoferrate (III)

19. In neutral or faintly alkaline solutions, permanganate ion reacts with thiosulphate ions to form

   (1) MnO_2 and $S_4O_6^{2-}$
   (2) Mn^{2+} and S
   (3) MnO_2 and SO_4^{2-}
   (4) Mn^{2+} and SO_4^{2-}

SECTION-II : ONE OR MORE THAN ONE CORRECT ANSWER TYPE

This section contains 1 multiple choice question, which has 4 choices (1), (2), (3) and (4) out of which **ONE OR MORE THAN ONE** choice(s) is(are) correct.

20. Spin only magnetic moment value of which of the given ions is equal to 3.87 BM?

   (1) Fe^{2+}
   (2) Cr^{3+}
   (3) Co^{2+}
   (4) V^{2+}

BIOLOGY

SECTION-I : SINGLE CORRECT ANSWER TYPE

This section contains 17 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONLY ONE** choice is correct.

21. A molecule that can act as a genetic material

   (1) Should be unstable chemically and structurally
   (2) Should be able to generate its replica
   (3) Should provide the scope for fast mutation
   (4) Should not be able to express itself

22. Bacteriophage $\phi \times 174$ has

   (1) 48502 nucleotides
   (2) 48502 base pairs
   (3) 5386 nucleotides
   (4) 5386 base pairs

23. A colourblind daughter is born when her

   (1) Father is colourblind and mother is homozygous normal
   (2) Mother is colourblind and father is normal
   (3) Mother is carrier and father is normal
   (4) Mother is carrier and father is colourblind

24. Presence of more than two alleles for a gene is known as

   (1) Co-dominance
   (2) Pleiotropy
   (3) Multiple allelism
   (4) Incomplete dominance

25. Embryo formation in *Citrus* **cannot** be a result of

    (1) Double fertilization   (2) Apomixis

    (3) Triple fusion   (4) Syngamy

26. What will be the ploidy of endosperm in a flowering plant when male plant is tetraploid (4n) and female plant is hexaploid (6n)?

    (1) 4n   (2) 6n

    (3) 8n   (4) 10n

27. Swiss cheese is ripened with the help of

    (1) *Lactobacillus*   (2) Yeast

    (3) *Propionibacterium shermanii*   (4) *Penicillium notatum*

28. Dough which is used for making bread is fermented by using

    (1) *Lactobacillus*   (2) *Saccharomyces cerevisiae*

    (3) *Aspergillus*   (4) *Acetobacter aceti*

29. How many highly coiled, sperm producing tubules are found approximately in a normal adult human male reproductive system?

    (1) 250 - 500   (2) 500 - 1500

    (3) 250 - 750   (4) 1500 - 2000

30. All of the following are associated with test tube baby programme, **except**

    (1) *In-vitro* fertilisation   (2) ZIFT

    (3) IUI   (4) ET

31. In human males, which of the following is considered as the primary sex organ?

    (1) Testes   (2) Epididymis

    (3) Prostate gland   (4) Penis

32. The organisation which is responsible for making decisions regarding the validity of GM research and the safety of introducing GM-organisms for public services is

    (1) Genetics and Ethical Issue Action Committee

    (2) Genetic Engineering Approval Committee

    (3) Genome Environment Action Committee

    (4) Genetic Environment Approval Committee

33. Hashish and marijuana are hallucinogenic substances extracted from

    (1) *Papaver somniferum*   (2) *Cannabis sativa*

    (3) *Erythroxylum coca*   (4) *Claviceps purpurea*

34. Which of the following is **not** true for transgenic animals?

    (1) Used in conventional method of diagnosis of diseases

    (2) Used in the study of normal human physiology and development

    (3) Used in the production of useful biological products

    (4) Used in testing toxicity of drugs

35. IgE and number of eosinophils increase in our body generally during

    (1) Allergy   (2) Typhoid

    (3) Cancer   (4) Malaria

36. The possible permanent cure for the genetic disorder "ADA deficiency" is

    (1) Enzyme replacement therapy

    (2) Infusion of genetically engineered lymphocytes having functional ADA cDNA periodically

    (3) Introduction of gene isolated from marrow cells producing ADA at early embryonic stage

    (4) Bone marrow transplantation in later stages of life

37. In pBR322, which of the following restriction sites is **not** present in selectable marker gene?

    (1) *Bam*H I   (2) *Sal* I

    (3) *Eco*R I   (4) *Pvu* I

SECTION-II : ONE OR MORE THAN ONE CORRECT ANSWER TYPE

This section contains 3 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) out of which **ONE OR MORE THAN ONE** choice(s) is(are) correct.

---

38. Cytidine

    (1) Is a nucleoside that has a pyrimidine base

    (2) Contains phosphoester linkage

    (3) Can be found in histone octamer

    (4) Shows the presence of free OH group on 5′C

39. Which of the following products is/are obtained from fungus?

    (1) Blood-cholesterol lowering agents

    (2) Clot buster

    (3) Immunosuppressive agent

    (4) Antibiotic discovered by Alexander Fleming

40. Consider the following statements w.r.t. menstrual cycle in human females and select the **incorrect** one(s).

    (1) Estrogen levels attain peak during the follicular and luteal phase.

    (2) Ovulatory phase follows the secretory phase.

    (3) Relaxin is secreted by non-pregnant females only.

    (4) Sudden increase in the levels of progesterone leads to endometrial shedding.

❑ ❑ ❑