BSc. (HONS) - PHYSICS ADMISSION TEST

INSTRUCTIONS

- **The Entrance Test will be of 60 mins**
- **The booklet has three Sections**

PHYSICS	**15 Questions (15 X 1 = 15)**
MATHEMATICS	**15 Questions (15 X 1 = 15)**
CHEMISTRY	**15 Questions (15 X 1 = 15)**
ENGLISH	**05 Questions (05 X 1 = 05)**

- **All questions carry equal marks.**
- **For each correct answer 2 marks will be awarded. There is no negative marking.**
- **Answer to be given by ticking the correct option.**
- **Use ball pen or dot pen only.**
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MM- 50 **Time- 60 Mins**

Details of the candidate

Name .....

Father's Name .....

Course Applied for .....

PHYSICS

1. The particles which can be added to the nucleus of an atom without changing its chemical properties are

A. Electrons
B. Protons
C. Neutrons
D. Positron

2. Who gave the Quantum model of hydrogen atom?

A. S.N Bose
B. Neils Bohr
C James Clerk Maxwell
DR.A Millikan

3. What is the unit of Astronomical Distance?

A. Light Year
B. Angstrom
C. Weber
D. Lux

4. If no external force acts on a system of bodies, the total linear momentum of the system of bodies remains constant. Which law states that ?

A. Newton's first law.
B. Newton's Second Law
C. Newton's Third Law.
D. Principle of conservation of linear momentum

5. An air bubble in water will act like a

A. convex lens
B. convex mirror
C. concave lens
D. concave mirror

6. with the increase of pressure, the boiling point of any substance

A. Increases
B. Decreases
C. Remains Same
D. Becomes zero

7. The phenomenon of interference is based on

A. Conservation of momentum.
B. conservation of energy.
C. conservation of momentum and energy.
D. quantum nature of light.

8. The electric motor converts

A. Electrical energy into mechanical energy
B. Mechanical energy into electrical energy
C. Electrical energy into light energy
D. None of these

9. If a lift is going up with acceleration, the apparent weight of a body is

A. More or less the true weight
B. Equal to the true weight
C. Less than the true weight
D. More than the true weight

10. If electrical conductivity increases with the increase of temperature of a substance, then it is a:

A. Conductor B. Semiconductor C. Insulator D. Carbonator

11. Which of the following Phenomena contribute significantly to the reddish appearance of the sun at sunrise or sun set ?

A. Dispersion of light.
B. Scattering of Light.
C. Total internal reflection of Light.
D. Reflection of light from earth.

12. If two bulbs of power 25 W and 100 W respectively each rated at 220 V are connected in series with the supply of 440 V. Which bulb will fuse?

A. 25 W Bulb
B. 40 Watt
C. None of these.
D. Both 1 & 2.

13. A long, vertical, metallic wire carries downward electric current. What would be the direction of the field if the current consisted of positive charges moving downward instead of electrons moving upward?

A. North
B. South
C. East
D. West

14. When a metal surface is illuminated by a monochromatic light of wavelength 'λ', then the potential difference required to stop the ejection of electrons is 3v. When the same surface is illuminated by the light of wavelength 2λ, then the potential difference required to stop the ejection of electrons is v V. Then for photoelectric effect work function is xhc. Find x

A. 6λ
B. $4\lambda/3$
C. 4λ
D. 8λ

15. The photoelectric work function of copper is 4.47 eV.The maximum potential upto which a copper ball remote from all other bodies, will be changed when irradiated by light of wavelength 140 nm is:

A. 4.37V
B. 4.23V
C. 8.70V
D. 8.46V

MATHEMATICS

1. Solve the inequality: $-(x+2)+2x>2(x-3)+3x$

A No Solution B $(4/5,+\infty)$ C. $(-\infty+\infty)$ D. $(-\infty, 1)$

2. Which of the following do(es) not belong to A×B for the sets A={1,2} and B={0,2}?

A R={(1, 1),(2, 1)} B. R={(1,0),(2,2)}
C. R={(1,0),(1,2)} D. R={(1,2),(2,2)}

3. If A is a square matrix such that $A^2=A$, then $(I+A)^3-7A$ is

A. 3I B. O C. 2 I D. I

4. Which of the following is not irrational?

A. $(2-\sqrt{3})2$ B. $(\sqrt{2}+\sqrt{3})2$ C. $(\sqrt{2}+\sqrt{3})$ D. $27\sqrt{7}$

5. If the line x+2ay+a=0,x+3by+b=0,x+4cy+c=0 are concurrent, then a,b,c are in.

A Arithmetic Progression
B Geometric Progression
C Harmonic Progression
D Arithmetic Geometric Progression

6. LCM of $2^3 \times 3^2$ and $2^2 \times 3^3$ is

A 2^3 B. $2^3 \times 3^3$ C. 3^3 D. $2^2 \times 3^2$

7. The value of the determinant $\begin{vmatrix} 1 & 0 & 0 \\ 2 & 4 & 0 \\ 3 & 5 & 2 \end{vmatrix}$ is

A. 0 B. 8 C. 7 D. 5

8. If z= 2-4i then complex conjugate of z is

A. 2+4i B. -2+4i C . -2-4i D. 2-4i

9. What will be the length of the side BC in a right angle triangle ABC if AB= 12 cm and $\Delta A = 30^0 \& \Delta C = 90^0$

A. 24 B. $6\sqrt{3}$ C. 6 D $24\sqrt{3}$

10. The mode of the following data : 14, 20, 27, 20, 14, 14, 13, 13, 21, 10, 27 is

A 14 B. 20 C. 13 D. 27

.11. If $\sin\theta = x$ and $\sec\theta = y$, then $\tan\theta$ is

A. xy B. x/y C. y/x D. 1/xy

12. The projection of a line segment on the axes of reference are 3,4 and 12 respectively. The length of the line segment is

A 19 B. 19/3 C. 5 D. 13

13. The cost of cultivating a square field at the rate of Rs.135 per hectare is Rs.1215. The cost of putting a fence around it at the rate of 75paise per meter would be ..... .

A Rs 360 B. Rs 810 C. Rs 900 D. Rs 1800

14. The differential equation of all straight lines in a plane passing through (0, 1) is:

A y-1=mx B. y=m(x-1) C. $y= xy_1$ D. $y=x_1+1$

15.The D.E whose solution is y = Asin 2x + B cos 2x given as:

A $y_2=4y$ B. $y_2+4y=0$ C .$y_2+3\ y=0$ D. $y_2+y=0$

CHEMISTRY

1. Which of the following is not a crystalline solid?

A. Potassium Chloride B. Cesium chloride C. Glass D. Rhombic Sulphur

2. An example of fossil fuel is

A. Coal B. Animal waste C. Wood D. All of these

3. An electrolyte

A a metal B. a solution C. a liquid that conducts current D. all of above

4. The process of transferring charge from charged body to earth is called:

A. Transferring B. Processing C. Charging D. Earthling

5. How many chloride ions are surrounding sodium ion in sodium chloride crystal ?

A 4 B 8 C 6 D 12

6. Bakelite is an example of

A elastomer B fibre C thermoplastic D thermosetting

7. Green House gases includes:

A. CO_2, Methane, Nitrous oxide B. CO_2, Argon, Nitrous oxide

C. CO_2, Methane, Chorine D. CO_2, Methane, Fluorine

8. A substance added to food containing fats and oils is called:

A. Oxidant B. Rancid C. Coolant D. Antioxidant

9. The drugs which are given to the patients suffering from anxiety and mental tension are known as

A. tranquilizers B. Analgesics C. Antimicrobials D antibiotics

10. Heat conduction is the property of

A. Non-metal B. Metal C. Metalloids D. All of these

11. Oxidation is a process which involves

A. addition of oxygen B. Addition of hydrogen C. removal of oxygen D. removal of hydrogen

12. Pure water can be obtained from sea water by:

A. Centrifugation B Plasmolysis C Reverse osmosis D Sedimentation

13. Solubility of a gas in a liquid increases on:

A. Increasing temperature.
B. Decreasing pressure.
C. Increasing pressure.
D. Increasing temperature and pressure.

14. Which one is the most electrically conductive from the following choices?

A. Sugar dissolved in water
B. Salt water
C. Salt dissolved in an organic solvent
D. An oil and water mixture

15. The boiling point of alcohol is higher than ether due to:

A. hydrogen bonding
B. large size of alcohol
C. presence of -OH group
D. high molecular weight

ENGLISH

FILL IN THE BLANKS

Choose the most appropriate word to fill the blank

1. The group was found to be -------- in subversive activities.

A. involved
B. Engaged
C. Rebellious
D. uncharitable

2. Krishna would have been ------- on any evidence he gave.

A. challenged
B. cross- examined
C. Praised
D. questioned

3. The ship_____, Robinson arrived on the Island.

A had been broken
B Having been broken
C. having broken
D. Has broken

4. John failed his exams because he was always out with his friends when he…….

A should have been studying
B. used to study
C. must have been studying
D. will have studied

5. The teacher ordered Kamal to leave the room and _____ him to return.

A. Stopped
B. Refused
C. Forbade
D. Challenged

UNITED UNIVERSITY

विद्या कल्पलतेव

BSc (Hons) MATHS ADMISSION TEST

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PHYSICS

1. Nuclear sizes are expressed in a unit named

(a) Fermi (b) Angstrom
(c) Volt (d) Tesla

2. The speed of light will be minimum while passing through

(a) Water (b) vacuum
(c) Air (d) Glass

3. Which of the following is not a vector quantity?

(a) Speed (b) velocity
(c) Torque (d) displacement

4. A pencil placed vertically on a table falls down. What will be the linear velocity of middle of pencil at the end of the fall if the pencil is 15 cm long?

(a) 1.05 m/s (b) 2.1 m/s
(c) 3 m/s (d) 0.5 m/s

5. Which of the following laws was modified by Maxwell by introducing the displacement current?

(a) Gauss's law (b) Ampere's law
(c) Biot-Savart's law (d) none of these

6. When light travels from one medium to another, which of the following does not change?

(a) Frequency (b) velocity
(c) refractive index (d) wavelength

7. Which of the following is conserved when light waves interfere?

(a) Phase (b) intensity
(c) Amplitude (d) none of these

8. When a Polaroid is rotated, the intensity of light varies but never reduces to zero. It shows that the incident light is

(a) Unpolarised (b) completely plane polarised
(c) partially plane polarised (d) None of the these

9. The principle that a quantum orbital cannot be occupied by more than two electrons was given by:

(a) Pauli (b) Millikan
(c) Hund (d) None of these

10. What is measured with the Nephometer?

(a) Volume of rainfall (b) Cloud volume and speed
(c) Salinity of Sea (d) All options are correct.

CHEMISTRY

1. Which one of the following is non-crystalline or amorphous?

(a) Diamond
(b) Graphite
(c) Glass
(d) Common Salt

2. The atmospheric pollution is generally measured in the units of

(a) Mass percentage
(b) volume fraction
(c) Volume percentage
(d) ppm

3. Hydrogen bomb is based on the principle of

(a) Nuclear fission
(b) nuclear fusion
(c) Natural radioactivity
(d) artificial radioactivity

4. Faraday's law of electrolysis is related to

(a) Atomic number of cation
(b) Speed of cation
(c) Speed of anion
(d) Equivalent weight of electrolyte

5. In a reaction, 2X → Y, the concentration of X decreases from 0.50 M to 0.38 M in 10 min. What is the rate of reaction in Ms^{-1} during this interval?

(a) 2×10^{-4}
(b) 2×10^{-2}
(c) 4×10^{-2}
(d) 1×10^{-2}

6. Which of the following types of metals make the most efficient catalyst?

(a) Alkali metals
(b) Transition metals
(c) Inner transition metals
(d) Alkaline earth metals

7. Which of the following is a non-metal that remains liquid at room temperature?

(a) Chlorine
(b) Phosphorous
(c) Bromine
(d) Helium

8. Which of the following amides will give ethylamine on reaction with sodium hypobromide?

(a) Butanamide
(b) Acetamide
(c) Propanamide
(d) Benzamide

9. Which one of the following is not a mixture?

(a) Air
(b) Mercury
(c) Milk
(d) Cement

10. What is the basic formulae for starch?

(a) $(C_6H_{12}O_6)_n$
(b) $C_{12}O_{12}O_{11}$
(c) $(C_6H_{10}O_5)_n$
(d) $(C_6H_{12}O_4)_n$

MATHEMATICS

1. If an operation is defined by $a * b = a^2 + b^2$, then $(1 * 2) * 6$ is

(a) 12 (b) 28

(c) 61 (d) None of these

2. Simplified form of $\cos^{-1}(4x^3 - 3x)$

(a) $3 \sin^{-1}x$ (b) $3 \cos^{-1}x$

(c) $\pi - 3 \sin^{-1}x$ (d) None of these

3. If A and B are square matrices then (AB)' =

(a) B'A' (b) A'B'

(c) AB' (d) A'B'

4. The area of a triangle with vertices (-3, 0) (3, 0) and (0, k) is 9 sq. units. The value of k will be

(a) 9 (b) 3

(c) -9 (d) 6

5. What type of a relation is R = {(1, 3), (4, 2), (2, 4), (2, 3), (3, 1)} on the set A – {1, 2, 3, 4}

(a) Reflexive (b) Transitive

(c) Symmetric (d) None of these

6. The set of points where the function f given by $f(x) = |2x - 1| \sin x$ is differentiable is

(a) R (b) $(0, \infty)$

(c) R = {1/2} (d) None of these

7. (2, – 3, – 1) $2x - 3y + 6z + 7 = 0$

(a) 4 (b) 2

(c) 3 (d) 1/5

8 Area of the region in the first quadrant enclosed by the x-axis, the line y = x and the circle $x^2 + y^2 = 32$ is

(a) 16π sq. Units (b) 4π sq. units

(c) 32π sq. Units (d) 24π sq. units

9. The maximum value of the object function $Z = 5x + 10y$ subject to the constraints $x + 2y \leq 120$, $x + y \geq 60$, $x - 2y \geq 0$, $x \geq 0$, $y \geq 0$ is

(a) 300 (b) 600

(c) 400 (d) 800

10. If A, B are two events associated with same random experiment such that P(a) = 0.4, P(b) = 0.8 and P(B/A) = 0.6 then P(A/B) is

(a) 0.3 (b) 0.5

(c) 0.4 (d) 0.6

ENGLISH

FILL IN THE BLANKS

1. Our Sir teaches Mathematics …… English.

(a) Across (b) Besides
(c) Beside (d) Both

2. I don't know the city …… he lives.

(a) What (b) when
(c) Where (d) which

3. After six months, you can also speak in English …… me.

(a) Around (b) like
(c) Without (d) about

4. America …… a powerful president

(a) Have (b) is
(c) Has (d) does

ONE WORD SUBSTITUTION

5. A story of old times gods or heroes:

(a) Lyric (b) Legend
(c) Epic (d) Romance