MOCK TEST 2, 2024

HS 2ND YEAR SCIENCE

TIME : 1 HOUR **MARKS: 120(JEE), 200(NEET)**

MATHEMATICS

1. If $\int f(x)cosx.\,dx = \frac{1}{2}f^2(x) + c$, then $f(x)$ is

(a) x (b) $sinx$ (c) $cosx$ (d) 1

2. $\int \frac{1}{sin^2xcos^2x}dx$

(a) $tanx - cotx + c$ (b) $tanx + cotx + c$ (c) $sinx + cosx + c$ (d) *None of these*

3. The value of $\lim_{x\to 0} x^x$ is

(a) 0 (b) -1 (c) 1 (d) $\propto$

4. The function

$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & if\ x \neq 2 \\ 5 & if\ x = 2 \end{cases}$$

Is removable discontinuity remove for

(a) 1 (b) 2 (c) 4 (d) 3

5. A pair of dice is tossed once and a total of 8 has appeared. What is the chance that odd number appears on each dice?

(a) $\frac{2}{9}$ (b) $\frac{1}{4}$ (c) $\frac{2}{5}$ (d) none of these

6. If A and B are two events such that $P(A) > 0\ and\ P(B) \neq 1$ then $P(\bar{A}/\bar{B})$ is equal to

(a) $1 - P(A/B)$ (b) $1 - \{P(A)/P(B)\}$

(c) $[1 - P(A \cup B)]/P(\bar{B})$ (d) $P(\bar{A})/P(\bar{B})$

7. If $y = \sqrt{cos\sqrt{x}}$ then $\frac{dy}{dx} = ?$

(a) $\frac{-sin\sqrt{x}}{2\sqrt{x}}$ (b) $\frac{-sin\sqrt{x}}{4\sqrt{cos\sqrt{x}}}$ (c) 0 (d) None of these

8. If $y = cosec^{-1}x$ then $\frac{dy}{dx} = ?$

(a) $\frac{1}{x\sqrt{1-x^2}}$ (b) $\frac{-1}{x\sqrt{1-x^2}}$ (c) $\frac{-1}{x\sqrt{x^2-1}}$ (d) $\frac{1}{x\sqrt{x^2-1}}$

9. The minimum value of $3cos\theta + 5\sin\left(\theta - \frac{\pi}{6}\right)$

(a) -1 (b) $\sqrt{19}$ (c) $\sqrt{76}$ (d) $\sqrt{19}$

10. If $cosA = mcosB$ then $\cot\left(\frac{A+B}{2}\right)\cot\left(\frac{B-A}{2}\right) =$

(a) $\frac{m-1}{m+1}$ (b) $\frac{m+2}{m-2}$ (c) $\frac{m+1}{m-1}$ (d) None of these

BIOLOGY

1. What is the definition of health according to the World Health Organization (WHO)?

a. Absence of illness or disease

b. State of complete physical, mental, and social well-being

c. Ability to recover quickly from injuries.

d. Regular exercise and balanced diet

2. Which of the following best describes a disease?

a. A state of well-being and optimal functioning

b. An abnormal condition that negatively affects the structure or function of an organism

c. A temporary discomfort experienced by an individual.

d. A condition caused solely by genetic factors.

3. Which of the following is an example of an infectious disease?

a. Diabetes b. Asthma c. Tuberculosis d. Hypertension

4. Which of the following is considered a non-infectious disease?

a. Influenza b. HIV/AIDS c. Diabetes mellitus d. Malaria

5. Which of the following diseases is caused by bacteria?

a. Malaria b. Typhoid c. Hepatitis B d. Dengue fever

6. Which of the following is a characteristic feature of bacterial diseases?

a. They are always contagious.

b. They are caused by viruses.

c. They can be treated with antibiotics.

d. They do not require medical intervention for recovery.

7. The testes are situated outside the abdominal cavity within a pouch called scrotum. This is necessary as:

a. The scrotum can contain lengthy ducts for the transfer of sperms

b. Scrotum helps in maintaining the low temperature of the testes necessary for spermatogenesis

c. Scrotum reduces the pressure around testes necessary for spermatogenesis

d. Scrotum can store huge amounts of sperms

8. Each seminiferous tubule is lined on its inside by:

a. Spermatogonia b. Primary spermatocytes c. Sertoli cells d. Both a and c

9. Leydig cells:

a. Are present in seminiferous tubules and secrete androgens

b. Are present in seminiferous tubules and help in maturation of sperms

c. Are present in interstitial space and secrete androgens

d. Are present in interstitial space and help in maturation of sperms

10. Seminal plasma is rich in:

a. Sucrose, calcium and certain enzyme b. Glucose, sodium and certain enzymes

c. Fructose, calcium and certain enzymes d. Fructose, sodium and certain enzymes

11. Which of these structures contributes the greatest percentage to semen ?

a. Bulbourethral glands b. Prostate c. Seminal vesicles d. Testes

12. Which human male accessory reproductive duct receives a duct from the seminal vesicle?

a. Rete testis b. Vas deferens c. Epididymis d. Urethra

13. 1. Yeast is used in the production of

a) Citric acid and lactic acid b) Cheese and butter c) Lipase and pectinase d) Bread and beer

14. Which of the following is correct about prions?

a) Infectious neurological disease b) it cause mad cow disease
c) consist of abnormally folded protein d) all of these

15. Viroids was discovered by which scientists?
a) T.O Diener b) Beijerinek c) Ivanowsky d) Stanley

16. Which of the following members of fungi does not have mycelium septate and branched?

a) Deuteromycetes b) Ascomycetes c) Phycomycetes d) Basidiomycetes

17. Heterocyst is present in which organism?

a) Entamoeba b) plasmodium c) Anabaena d) mycoplasma

18. For the production of ethanol, the most common substrate used in distilleries is

a) Soya meal b) Molasses c) Ground gram d) cornmeal

19. DNA and RNA are-

a. Nucleic acid b. Amino acid c. Protein d. Carbohydrate

20. Functional segment of a DNA is called-

a. Allele b. Gene c. RNA d. Chromosome

21. Nucleic Acids are polymer of repeating monomeric units called-

a. Nucleoside b. Gene c. Pentose Sugar d. Nucleotide

22. Nucleosides contain-

a. Pentose sugar, Nitrogenous base b. Pentose sugar, Phosphate group

c. Pentose sugar, Nitrogenous base, phosphate group d. Triose sugar, phosphate group

23. Nucleosides are different from nucleotides as

a. It lacks a nitrogenous base b. It has a phosphate group

c. It lacks a phosphate group d. It contains a nitrogenous base

24. Nature of the DNA is

a. Acidic b. Basic c. Neutral d. None of the above

25. At about what percentage of the full sunlight does light saturation occurs in photosynthesis?

a.10 b.25 c.70 d.95

26. Splitting of water is associated with

a. photosystem I b. lumen of thylakoid

c both photosystems I and II d. inner side of thylakoid membrane

27. The correct sequence of flow of electrons in the light reaction is:

a. PS II, plastoquinone, cytochromes, PS I, ferredoxin

b. PS I, plastoquinone, cytochromes, PS II, ferredoxin

c. PS I, ferredoxin, PS II

d. PS I, plastoquinone, cytochromes, PSII, ferredoxin

28. Gibberellic acid is a/an:-

a. Indole compound b. Terpene c. Adenine derivative d. Carotenoid

29. In most situations, which of the following acts as an antagonist to GAs?

a. ABA b. IAA c. Kinetin d. Ethylene

30. The co-factor required for the activity of pyruvate dehydrogenase is:

a. Zinc b. Magnesium c. Manganese d. Copper

PHYSICS

Q1. The radius of curvature of a mirror is 20cm the focal length is

a. 20cm b. 10cm c. 40cm d. 5cm

Q2. Focal length of plane mirror is

a. infinity b. Zero c. Negative d. None of these

Q3. A concave mirror gives real, inverted and same size image if the object is placed

a. At F b. At infinity c. At C d. Beyond C

Q4. A body cannot have a charge of

a. 3.2×10^{-19} C (b) 1.6×10^{-18} C (c) 0.8×10^{-19} C (d) 1.6×10^{-19}

Q5. No of electrons in 1C charge

a. 6.25×10^{19} (b) 6.25×10^{18} (c) 6.25×10^{17} (d)None

Q6. The value of electrostatic force constant for air in SI system

a. 1 (b)2 (c)3 (d)None

Q7. Which of the following experiment established the existence of magnetic field around moving charges ?

a. Faraday and Henry experiment (b) Oersted experiment

(c) Millikan oil drop experiment (d)All above

Q8. When a bar magnet is moving towards a copper coil, a current is induced in a direction

a. Clockwise direction (b)Anticlockwise direction

(c) No preferred direction (d)No current can be induced

Q9. Which of the following statement is not true ?

a. Hans Christiana Oersted gives the law of electromagnetic induction
b. Michael Faraday suggested the quantisation of electric charge of a body
c. Neil's Bohr discovered the nucleus of an atom
d. Joseph Henry demonstrated a long series of experiment of electromagnetic induction.

Q10. Atoms with same mass number but different atomic numbers are called

a. isotopes b. isobars c. isotone d. None of these

$q = ne$

$q = n \times 1.6 \times 10^{-19}$

CHEMISTRY

1. Which of the following is dependent on temperature?
(a) Molality (b) Molarity (c) Mole fraction (d) Weight percentage

2. The term homogenous mixtures signifies that
(a) its composition is uniform throughout the mixture.
(b) its properties are uniform throughout the mixture.
(c) both composition and properties are uniform throughout the mixture.
(d) neither composition nor properties are uniform throughout the mixture.

3. What will occur if a block of copper metal is dropped into a beaker containing a solution of 1 M $ZnSO_4$?
(a) The copper metal will dissolve with evolution of oxygen gas.
(b) The copper metal will dissolve with evolution of hydrogen gas.
(c) No reaction will occur.
(d) The copper metal will dissolve and zinc metal will be deposited.

4. A similarity between optical and geometrical isomerism is that
(a) each forms equal number of isomers for a given compound
(b) if in a compound one is present then so is the other
(c) both are included in stereoisomerism
(d) they have no similarity.

5. Increasing order of stability among the three main conformations (i.e., eclipse, anti, gauche) of 2-fluoroethanol is
(a) eclipse, gauche, anti (b) gauche, eclipse, anti (c) eclipse, anti, gauche (d) anti, gauche, eclipse

6. The number of structural isomers for C_6H_{14} is
(a) 3 (b) 4 (c) 5 (d) 6

7. The rule that explains the reason for chromium to have $[Ar]3d^5\ 4s^1$ configuration instead of $[Ar]\ 3d^4s^2$?
a) Pauli's exclusion principle b) Aufbau Principle
c) Hund's rule d) Heisenberg's Uncertainty principle

8. Which of the following statements in relation to the hydrogen atom is correct?
(a) 3s orbital is lower in energy than 3p orbital.
(b) 3p orbital is lower in energy than 3d orbital.
(c) 3s and 3p orbitals are of lower energy than 3d orbital.
(d) 3s, 3p and 3d orbitals all have the same energy

9. Camphor is often used in molecular mass determination because
(a) it is readily available (b) it has a very high eryoscopic constant
(c) it is volatile (d) it is solvent for organic substances

10. Which of the following statements is not correct for a nucleophile?
(a) Nucleophile is a Lewis acid (b) Ammonia is a nucleophile
(c) Nucleophiles attack low electrons density sites (d) Nucleophiles are not electron seeking