MOCK TEST 1, 2024
HS 2ND YEAR SCIENCE

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

MATHEMATICS

1. $\int 2^{\log_4 x}\, dx =$

(a) $\sqrt{x} + c$ (b) $\frac{2}{3}x^{\frac{3}{2}} + c$ (c) $\frac{1}{2}\sqrt{x} + c$ (d) None of these

2. $\int \frac{cosx - cos2x}{1 - cosx} dx$

(a) $2sinx + x + c$ (b) $2cosx + x + c$ (c) $2sinx - x + c$ (d) *None of these*

3. The value of $\lim_{x \to 0^-} \frac{1}{x} =$

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

4. The value of k such that the function

$$f(x) = \begin{cases} \frac{ksin(\pi - x)}{\pi - x} & if\ x \neq \pi \\ 1 & \text{if } x = \pi \end{cases}$$

Continuous at $x = \pi$ is

(a) π (b) 1 (c) -1 (d) 0

5. Let $0 < P(A) < 1, 0 < P(B) < 1$ and $P(A \cup B) = P(A) + P(B) - P(A)P(B)$ then

(a) $P\left(\frac{B}{A}\right) = P(B) - P(A)$ (b) $P\left(\frac{A}{B}\right) = P(A) - P(B)$ (c) $P\left(\frac{A}{B}\right) = P(A)$ (d) none of these

6. For two events E and F associated with an experiment , $P(E \cup F) = P(E \cap F)$, which of the following is not true?

(a) $P(E) + P(F) = 2P(E \cap F)$ (b) $P(E) + P(F) = 2P(E)P(\frac{F}{E})$

(c) $P(E) + P(F) = 2P(F)P(\frac{E}{F})$ (d) none of these

7. If $m = x^{3^{19}}$ then $\frac{dm}{dx} =$?

(a) *not defined* (b) 0 (c) $9x^{782}$ (d) None of these

8. If $z = y^4$ then $\frac{dz}{dx} =$?, where $y = 4$

(a) $4y^3 \frac{dy}{dx}$ (b) 256 (c) 0 (d) None of these

9. If $|z^2 - 1| = |z|^2 + 1$, then z lies on

(a) An ellipse (b) The imaginary axis (c) a circle (d) The real axis

10. If $x\cos\theta = y\cos\left(\theta + \frac{2\pi}{3}\right) = z\cos\left(\theta + \frac{4\pi}{3}\right)$, then the value of $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is equal to

(a) 1 (b) 2 (c) 0 (d) None of these

BIOLOGY

1. Which of the following true for heart failure?

a. State of heart when it is not pumping blood effectively enough to meet the needs of the body

b. Heart lacks enough oxygen

c. Heart stops beating d. Both (a) and (b)

2. Which of the following true for cardiac arrest ?

a. State of heart when it is not pumping blood effectively enough to meet the needs of the body

b. Sometimes called congestive heart failure because congestion of the lungs is one of the main symptoms of this disease

c. Heart stops beating d. All of the above

3. Which of the following true for heart attack?

a. State of heart when it is not pumping blood effectively enough to meet the needs of the body

b. Heart stops beating c. Heart muscle is suddenly damaged by an inadequate blood supply

d. All of the above

4. Under this circumstance, an antigen-antibody reaction will occur. A person with

a) Type A blood is given type O blood b) Type AB blood is given type O blood

c) Type O blood is given type A blood d) Type AB blood is given type B blood

5. When body tissues are injured resulting in the loss of blood, the process of blood clot begins and the blood platelets release

a) Fibrinogen b) Thrombin c) Prothrombin d) Thromboplastin

6. Which of the following are not membrane-Bound?

a. Ribosomes b. Mesosomes c. Vacuoles d. Lysosomes

7. Which one of the following is not considered a part of the endomembrane system?

a. Lysosome b.Vacuole c. Golgi complex d. Peroxisome

8.Ribosomal RNA is actively synthesized in

a.Ribosomes b.Nucleolus c.Nucleoplasm d.Lysosomes

9.Which of the following statements regarding mitochondrial membrane is not correct?

a.The inner membrane is highly convoluted forming a series of infoldings

b.The enzymes of the electron transport chain are embedded in the outer membrane

c.The outer membrane is permeable to all kinds of molecules

d.The outer membrane resembles a sieve

10.Middle lamella is mainly composed of

a.Hemicellulose b.Muramic acid c.Calcium pectate d.Phosphoglycerides

11.The nuclear envelope is a derivative of

a.Membrane of Golgi complex b.Smooth endoplasmic reticulum

c.Rough endoplasmic reticulum d.Microtubules

12.The two subunits of ribosome remain united at a critical ion level of

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

13. Among the following flower, radial symmetry is present in

a. Brassica b. Trifolium c. Cassia d. Pisum

14.Gynoecium with fused carpels is known as-

a. Syncarpous b. Syngenecium c. Apocarpous dAll of the above

15. Which location does the Testa of seed develop from?

a. Outer integument b. Hilum c. Ovary wall d. Funicle

16.In Swiss cheese, big holes are made by a

a. bacterium producing methane gas b. machine

c. fungus releasing a lot of gases while its metabolic activities

d. bacterium producing large quantities of carbon dioxide

17.What causes the puffed-up appearance of dough?

a. Oxygen b. Carbon dioxide c. Sulphur dioxide d. Water vapour

18. Which of the following is the genome of the virus?

a. DNA b. RNA c. DNA or RNA d. DNA and RNA

19. Consider the following features:

I. Chlorophyll a and Chlorophyll c II. Fucoxanthin III. Floridean starch

IV. Flagella 2 in number, unequal and lateral

Which of these are seen in Phaeophyceae?

a. I, II, III b. I, II, IV c. II, III, IV d. I, II, III, IV

20. What is not true for red algae?

a. Lack centriole and flagella

b. Accessory pigments include phycocyanin, phycoerythrin and allophycocyanin

c. They reproduce using alternation of generation

d. The stored food is floridean starch very similar to cellulose

21. The formation of interfascicular cambium in plants is due to:-

a. Non-differentiation b. Re-differentiation c. Differentiation d. De-differentiation

22. Heterophyllous development due to environment is an example of:-

a.Developmental noise b. Norm of the reaction c. Convergence d. Plasticity

23. Auxin can be bioassayed by?

a. Avena coleoptiles curvature elongation b. Hydroponics c. Ptometer d. Lettuce hypocotyl

24. During seed germination its stored food is mobilized by:

a. Cytokinin b. ABA c. Gibberellin d. Ethylene

25. What is the primary function of insulin in the human body?

a. Regulation of blood sugar levels b. Regulation of blood pressure

c. Regulation of body temperature d. Regulation of electrolyte balance

26. Which gas exchange process primarily occurs in the alveoli of the lungs?

a. Oxygen diffusion into the bloodstream and carbon dioxide diffusion out of the bloodstream

b. Carbon dioxide diffusion into the bloodstream and oxygen diffusion out of the bloodstream

c. Nitrogen diffusion into the bloodstream and oxygen diffusion out of the bloodstream

d. Oxygen diffusion into the alveoli and carbon dioxide diffusion out of the alveoli

27. Which enzyme is responsible for breaking down proteins into peptides in the stomach?

a. Lipase b. Amylase c. Pepsin d. Trypsin

28. Which parasitic worm is commonly known as the "pinworm"?

a. *Ascaris lumbricoides* b. *Trichuris trichiura* c. *Enterobius vermicularis* d. *Taenia solium*

29. Which hormone is responsible for regulating calcium levels in the blood?

a. Insulin b. Thyroxine c. Parathyroid hormone (PTH) d. Estrogen

30. Which structure in the respiratory system is responsible for filtering, warming, and moistening the air as it enters the lungs?

a. Bronchi b. Trachea c. Nasal Cavity d. Pharynx

CHEMISTRY

1. The correct order of electronegativity of carbon in ethane, ethene and ethyne is
(a) ethane < ethene < ethyne (b) ethyne < ethene < ethane
(c) ethene < ethyne < ethane (d) ethene < ethane < ethyne

2. Among the following, which one is an isomer of alcohol?
(a) Methanol (b) Acetone (c) Diethylether (d) Dimethylether

3. An alkyl group is derived from
(a) a saturated hydrocarbon by removing a hydrogen atom from carbon
(b) an unsaturated hydrocarbon by removing a hydrogen atom from carbon
(c) Both (a) and (b)
(d) None of the above

4. The number of structural isomers possible from the molecular formula C_3H_9N is
(a) 4 (b) 5 (c) 2 (d) 3

5. How many chain isomers are given by the compound, C_5H_{12}?
(a) Three (b) Two (c) Four (d) Only one

6. Lassaigne's test is not used for the detection of which element?
(a) Carbon (b) Halogens (c) Nitrogen (d) Sulphur

7. What is the name of tube in which a known mass of an organic compound is heated for the quantitative
analysis of sulphur?
(a) Borosil tube (b) Carius tube (c) Kjeldahl tube (d) None of these

8. The correct statement regarding electrophile is
(a) electrophile is a negatively charge species and can form a bond by accepting a pair of electrons from a nucleophile
(b) electrophile is a negatively charged species and can form a bond by accepting a pair of electrons from
another electrophile
(c) electrophiles are generally neutral species and can form a bond by accepting a pair of electrons from a nucleophile
(d) electrophile can be either neutral or positively charged species and can form a bond by accepting a pair of electrons from a nucleophile

9. The ratio of percentage s -character of C-atom in ethyne and ethene is equal to

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

10. During hearing of a court case, the judge suspected that some changes in the documents had been carried out. He asked the forensic department to check the ink used at two different places. According to you which technique can give the best results?

(a) Column chromatography (b) Solvent extraction

(c) Distillation (d) Thin layer chromatography

PHYSICS

Q1. According to Rutherford's atomic model, the Electrons inside an atoms are

(a) stationary (b) centralized (c) non stationary (d) none of these.

Q2. If an electron jumps from 1st orbit to 3rd orbit, then it will

(a) Not lose energy (b) not given energy (c) release energy (d) absorb energy.

Q3. In Bohr model of hydrogen atom, which of the following is quantised ?

(a) linear velocity of electron (b) angular velocity of electron

(c) linear momentum of electron (d) angular momentum of electron.

Q4.The number of waves, contained in unit length of the medium, is called

(a) elastic wave (b) wave number (c) wave pulse (d) electromagnetic wave.

Q5. Which of the following is not a fundamental unit according SI ?

(a) metre (b) Ampere (c) Candela (d) Coulomb

Q6. The workdone per unit charge is termed as

(a) electric potential (b) electric energy (c) electric current (d) electric field intensity

Q7. The workdone by/ against a conservative force

(a) depends on the path followed by the body (b) does not depends on initial and final point.
(c) maximum in case of circular path (d) equal to potential energy

Q8. A ray of light is incident on a plane mirror at an angle of incidence 30°. The ray after reflection is deviated through

(a) 30° (b) 90° (c) 60° (d) 120°

Q9. The laws of reflection hold good for

(a) plane mirror only (b) concave mirror only

(c) convex mirror only (d) all mirrors irrespective of their shape

Q10. Magnification produced by a rear view mirror fitted in vehicles

(a) is less than one (b) is more than one (c) is equal to one

(d) can be more than or less than one depending upon the position of the object in front of it.