NEW STANDARD ACADEMY

Exam NEET - JEE **Marks: 60**
Date : 26-06-23 CLASS : 12TH **Time: 90:MIN**

PHYSICS

1. A river is flowing from W to E with a speed 5m/min. A man can swim in still waters at a velocity 10 m/min. In which direction should a man swim to take the shortest path to reach the south bank?
2. The vector sum of two force P and Q is minimum when the angle θ between their positive directions, is
3. Two forces P and Q acting at a point are such that if P is reversed, the direction of the resultant is turned through 90º . Then find P/Q.
4. Velocity as a function of time is V(t) = $\sin^2 t - \cos(2t)$.Then the value of $v\left(\frac{\pi}{3}\right)$ will be :
5. Three vectors $\vec{A},\vec{B}$ and $\vec{C}$ are such that $\vec{A} = \vec{B}+\vec{C}$ and their magnitudes are in ratio 5 : 4 : 3 respectively. Find angle between vector $\vec{A}$ and $\vec{C}$

6.In an experiment, the period of oscillation of a simple pendulum was observed to be 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s. The mean absolute error is

7.A new system of units is proposed in which unit of mass is α kg, unit of length is β m and unit of time is γ s. What will be value of 5 J in this new system?

8.If velocity of c, Plank's constant h and gravitational constant G are taken as fundamental quantities then the dimensions of length will be

9.The position of a particle at time t is given by the relation $x(t)=\left(\frac{v_0}{\alpha}\right)(1-c^{-\alpha t})$, where v_0 is a constant and $\alpha > 0$. The dimensions of v_0 and α are respectively

10. Two cells ofemf 1.5 V and 2.0 V having internal resistances $0.2W$ and $0.3W$ respectively are connected in parallel. Calculate the emf and internal resistance of the equivalent cell.

CHEMISTRY

11. Define the term mass percentage.
12. Explain Henry's law about dissolution of a gas in a liquid.
13. If the vapour pressure of C_2H_5OH at 298 K is 40 mm of Hg. Its mole fraction in a solution with CH_3OH is 0.8. what will be its vapour pressure in solution. If it obeys Raoult's law?
14. A 6.90 M solution of KOH is water contains 30% by mass of KOH. Calculate the density of the KOH solution. [Molar mass of KOH = 56 g mol^{-1}]
15. Calculate the mass percentage of benzene (C_6H_6) and carbon tetrachloride (CCl_4), if 22 g of benzene is dissolved in 122 g of CCl_4.
16. A silver atom has completely filled d – orbital $(4d^{10})$ in its ground state how can you say that it is a transition element?
17. Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation to their +3 state?
18. What are the characteristics of the transition elements and why are they called transition elements? Which of the d-block elements?
19. Discuss the effect of temperature and pressure on the solubility of solids in liquids.
20. State Henry's law correlating the pressure of a gas and its solubility in a solvent and mention two application for the law

BIOLOGY

21. Give the scientific name of mango, housefly,wheat and rat?
22. Taxonomy for a long time was considered as descriptive science. Why ?
23. What are the major divisions of classifications? Classify man.
24. What are taxonomic aids? Name a few taxonomic aids.
25. What different criteria would you choose to classify people that you meet often?
26. What is the nature of cell wall in diatoms ?
27. What are chemoautotrophic bacteria ? How they obtain energy ?

28. What are hormogonia ? Give one examples of cyanobacteria which reproduce by binary fission.
29. Why some fungi are called as 'imperfect fungi' ?
30. Some symbiotic organism are very good pollution indicators and composed of a chlorophyllous and a non-chlorophyllous members. Name and describe them

MATHS

21. If f(x) $= \frac{\sin(2\pi[\pi^2 x])}{5+[x]^2}$ ([.] denotes the greatest integer function), then f(x) is
22. The function f(x) = $\frac{\log(1+ax)-\log(1-bx)}{x}$ is not defined at x = 0. The value which should be assigned to f at x = 0, so that it is continuous at x = 0 is
23. The number of points at which the function f(x) $= \frac{1}{x-[x]}$ ([.] denotes, the greatest integer function) is not continuous is
24. If $f(x)=\begin{cases}2x+1 & \text{when } x<1\\ k & \text{when } x=1\\ 5x-2 & \text{when } x>1\end{cases}$ is continuous at x =1, then the value of k is
25. If the function $f(x)=\begin{cases}(\cos x)^{1/x}, & x\neq 0\\ k, & x=0\end{cases}$ is continuous at $x=0$, then the value of k is
26. If $f(x)=\begin{cases}\frac{1-\sin x}{\pi-2x}, & x\neq\frac{\pi}{2}\\ \lambda, & x=\frac{\pi}{2}\end{cases}$ be continuous at $x=\frac{\pi}{2}$, then value of λ is
27. Consider the function $f(x)=(\sin 2x)^{\tan^2 2x}, x\neq\frac{\pi}{4}$. The value of $f\left(\frac{\pi}{4}\right)$ such that fis continuous at $x=\frac{\pi}{4}$is
28. Consider the function f(x) = min $\{|x^2-9|, |x^2-1|\}$, then the number of points where f(x) is non-differentiable is/are
29. Domain of definition of the function $f(x)=\frac{3}{4-x^2}+\log_{10}(x^3-x)$, is
30. If $f(x)=\begin{cases}2x^2+3; x>3\\ ax^2+bx+1; x\leq 3\end{cases}$ is differentiable everywhere, then $\frac{a}{b^2}$is equal to ?