

# NEW STANDARD ACADEMY

Exam : MOCK- 12

NEET - JEE

Marks: 80

Date : 19-06-2023

CLASS : 12<sup>TH</sup>

Time: 2 HRS

## PHYSICS

1. A 6V battery is connected to the terminals of a three metre long wire of uniform thickness and resistance of  $100\Omega$ . The difference of potential between two points on the wire separated by a distance of 50 cm will be :

(a) 2V (b) 3V  
(c) 1V (d) 1.5 V

2. An electric kettle takes 4 A current at 220 V. How much time will it take to boil 1 kg of water from temperature  $20^\circ\text{C}$ ? The temperature of boiling water is  $100^\circ\text{C}$

(a) 6.3 min (b) 8.4 min  
(c) 12.6 min (d) 4.2 min

3. Current of 4.8 amperes is flowing through a conductor. The number of electrons per second will be

(a)  $3 \times 10^{19}$  (b)  $7.68 \times 10^{21}$   
(c)  $7.68 \times 10^{20}$  (d)  $3 \times 10^{20}$

4. When the current  $i$  is flowing through a conductor, the drift velocity is  $v$ . If  $2i$  current is flowed through the same metal but having double the area of cross-section, then the drift velocity will be

(a)  $v/4$  (b)  $v/2$   
(c)  $v$  (d)  $4v$

5. When current flows through a conductor, then the order of drift velocity of electrons will be

(a)  $10^{10} \text{ m / sec}$  (b)  $10^{-2} \text{ cm / sec}$   
(c)  $10^4 \text{ cm / sec}$  (d)  $10^{-1} \text{ cm / sec}$

6. Which one is not the correct statement

(a)  $1 \text{ volt} \times 1 \text{ coulomb} = 1 \text{ joule}$   
(b)  $1 \text{ volt} \times 1 \text{ ampere} = 1 \text{ joule / second}$   
(c)  $1 \text{ volt} \times 1 \text{ watt} = 1 \text{ H.P.}$   
(d) Watt-hour can be expressed in eV

7. If a 0.1 % increase in length due to stretching, the percentage increase in its resistance will be

(a) 0.2 % (b) 2 %  
(c) 1 % (d) 0.1 %

8. The temperature coefficient of resistance for a wire is  $0.00125 / ^\circ\text{C}$ . At 300K its resistance is 1 ohm. The temperature at which the resistance becomes 2 ohm is

(a) 1154 K (b) 1100 K  
(c) 1400 K (d) 1127 K

9. The resistance of a wire is 20 ohms. It is so stretched that the length becomes three times, then the new resistance of the wire will be

(a) 6.67 ohms (b) 60.0 ohms  
(c) 120 ohms (d) 180.0 ohms

10. On increasing the temperature of a conductor, its resistance increases because

(a) Relaxation time decreases  
(b) Mass of the electrons increases  
(c) Electron density decreases  
(d) None of the above

## CHEMISTRY

11. In a catalytic conversion of  $\text{N}_2$  to  $\text{NH}_3$  by Haber's process, the rate of reaction was expressed as change in the concentration of ammonia per time is  $40 \times 10^{-3} \text{ mol litre}^{-1} \text{ s}^{-1}$ . If there are no side reaction, the rate of the reaction as expressed in terms of hydrogen is (in  $\text{mol litre}^{-1} \text{ s}^{-1}$ )

(a)  $60 \times 10^{-3}$  (b)  $20 \times 10^{-3}$   
(c) 1.200 (d)  $10.3 \times 10^{-3}$

12. The temperature coefficient for reaction in which food deteriorates is 2. Then food deteriorates ..... times as rapidly at  $25^\circ\text{C}$  as it does at  $5^\circ\text{C}$

(a) Two (b) Four  
(c) Six (d) Twenty

13. The rate of a reaction

(a) Increases with increase in temperature  
(b) Decreases with increase in temperature  
(c) Does not depend on temperature  
(d) Does not depend on concentration

14. The velocity constant of a reaction at 290 K was found to be  $3.2 \times 10^{-3}$ . At 300 K it will be

(a)  $1.28 \times 10^{-2}$  (b)  $6.4 \times 10^{-3}$

- (c)  $9.6 \times 10^{-3}$  (d)  $3.2 \times 10^{-4}$

15. Rate of reaction  
 (a) Decreases with increase in temperature  
 (b) Increases with increase in temperature  
 (c) May increase or decrease with increase in temperature  
 (d) Does not depend on temperature
16. A first order reaction complete its 10% in 20 minutes then time required to complete its 19% is  
 (a) 30 minutes (b) 40 minutes  
 (c) 50 minutes (d) 38 minutes
17. The rate law for reaction  $A + 2B = C + 2D$  will be  
 (a) Rate =  $k[A][B]$  (b) Rate =  $k[A][2B]$   
 (c) Rate =  $k[A][B]^2$  (d) Rate =  $k \frac{[C][D]^2}{[A][B]^2}$
18. The rate law for the reaction  
 Sucrose + Water  $\xrightarrow{H^+}$  Glucose + Fructose is given by  
 (a) Rate =  $k$  [sucrose] [water]  
 (b) Rate =  $k$  [sucrose] [water]<sup>0</sup>  
 (c) Rate =  $k$  [sucrose]<sup>0</sup> [water]  
 (d) Rate =  $k$  [sucrose]<sup>1/2</sup> [water]<sup>1/2</sup>
19. For a reactions  $A + B \rightarrow$  product, it was found that rate of reaction increases four times if concentration of 'A' is doubled, but the rate of reaction remains unaffected. If concentration of 'B' is doubled. Hence, the rate law for the reaction is  
 (a) rate =  $k[A][B]$  (b) rate =  $k[A]^2$   
 (c) rate =  $k[A]^2[B]^2$  (d) rate =  $k[A]^2[B]^2$
20. The specific rate constant of a first order reaction depends on the  
 (a) Concentration of the reactants  
 (b) Concentration of the products  
 (c) Time of reaction  
 (d) Temperature of reaction

### BIOLOGY

21. According to one of the most widely accepted theories, earth's atmosphere before origin of life consisted of a mixture of  
 (a) O<sub>3</sub>, CH<sub>4</sub>, O<sub>2</sub> and H<sub>2</sub>O  
 (b) O<sub>3</sub>, NH<sub>3</sub>, CH<sub>4</sub> and H<sub>2</sub>O  
 (c) H<sub>2</sub>, CO<sub>2</sub>, NH<sub>3</sub> and CH<sub>4</sub>  
 (d) CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub> and H<sub>2</sub>O vapours
22. What did Miller obtained from his experiment?  
 (a) Amino acids (b) Organic compounds  
 (c) Nitrogen bases (d) All of these
23. What was the name of the sail ship used by Charles Darwin during his sea voyage?  
 (a) HMS Beagle (b) HSM Beagle  
 (c) HMS Eagle (d) HSM Eagle

24. Theory of natural selection as the mechanism of evolution was given by  
 (a) Lamarck (b) Darwin  
 (c) Alfred Wallace (d) JBS Haldane
25. Evidence that evolution of life forms has indeed taken place on earth has come from  
 (a) fossil studies (palaeontological evidences)  
 (b) morphological and comparative anatomical studies  
 (c) biochemical studies  
 (d) All of the above
26. Which one of the following options gives one correct example each of convergent evolution and divergent evolution?

	Convergent evolution	Divergent evolution
(a)	Eyes of <i>Octopus</i> and mammals	Bones of forelimbs of vertebrates
(b)	Thorns of <i>Bougainvillea</i> and tendrils of <i>Cucurbita</i>	Wings of butterflies and birds
(c)	Bones of forelimbs of vertebrates	Wings of butterfly and birds
(d)	Thorns of <i>Bougainvillea</i> and tendrils of <i>Cucurbita</i>	Eyes of <i>Octopus</i> and mammals

27. Divergent evolution gives rise to  
 (a) homologous organs (b) analogous organs  
 (c) Both (a) and (b) (d) None of these
28. Among the following sets of examples for divergent evolution, select the incorrect option.  
 (a) Brain of bat, man and cheetah  
 (b) Heart of bat, man and cheetah  
 (c) Forelimbs of man, bat and cheetah  
 (d) Eye of Octopus, bat and man
29. What does presence of homologous organs in different animals indicate?  
 (a) Different ancestry  
 (b) Common ancestry  
 (c) Independent development  
 (d) Dependent development
30. Tendrils of *Cucurbita* and thorns of *Bougainvillea* are examples of  
 (a) vestigial organs (b) analogous organs  
 (c) homologous organs (d) homoplasy

### MATHS

21. The value of  $b$  and  $c$  for which the identity  $f(x+1) - f(x) = 8x + 3$  is satisfied, where  $f(x) = bx^2 + cx + d$ , are  
 (a)  $b = 2, c = 1$  (b)  $b = 4, c = -1$   
 (c)  $b = -1, c = 4$  (d)  $b = -1, c = 1$
22. Let the function  $f: R \rightarrow R$  be defined by  $f(x) = 2x + \sin x, x \in R$ . Then  $f$  is  
 (a) One-to-one and onto  
 (b) One-to-one but not onto  
 (c) Onto but not one-to-one  
 (d) Neither one-to-one nor onto

23. 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

- (a)  $a-b$  (b)  $a+b$   
 (c)  $\log a + \log b$  (d)  $\log a - \log b$

24. Let  $f(x) = \begin{cases} \frac{x^3 + x^2 - 16x + 20}{(x-2)^2}, & \text{if } x \neq 2 \\ k, & \text{if } x = 2 \end{cases}$ . If  $f(x)$  be

continuous for all  $x$ , then  $k =$

- (a) 7 (b) -7  
 (c)  $\pm 7$  (d) None of these

25. At which points the function  $f(x) = \frac{x}{[x]}$ , where  $[.]$  is greatest integer function, is discontinuous

- (a) Only positive integers  
 (b) All positive and negative integers and  $(0, 1)$   
 (c) All rational numbers  
 (d) None of these

26. If  $f(x) = \begin{cases} \frac{1 - \cos 4x}{x^2}, & \text{when } x < 0 \\ a, & \text{when } x = 0, \\ \frac{\sqrt{x}}{\sqrt{(16 + \sqrt{x}) - 4}}, & \text{when } x > 0 \end{cases}$

is continuous at  $x=0$ , then the value of 'a' will be

- (a) 8 (b) -8  
 (c) 4 (d) None of these

27. The value of  $f(0)$ , so that the function

$f(x) = \frac{(27-2x)^{1/3} - 3}{9 - 3(243+5x)^{1/5}}$ , ( $x \neq 0$ ) is continuous, is given by

- (a)  $2/3$  (b) 6  
 (c) 2 (d) 4

28. If the function  $f(x) = \begin{cases} 1 + \sin \frac{\pi x}{2}, & \text{for } -\infty < x \leq 1 \\ ax + b, & \text{for } 1 < x < 3 \\ 6 \tan \frac{x\pi}{12}, & \text{for } 3 \leq x < 6 \end{cases}$  is

continuous in the interval  $(-\infty, 6)$ , then the values of  $a$  and  $b$  are respectively

- (a) 0, 2 (b) 1, 1  
 (c) 2, 0 (d) 2, 1

29. If  $f(x) = \begin{cases} \sin^{-1} |x|, & \text{when } x \neq 0 \\ 0, & \text{when } x = 0 \end{cases}$  then

- (a)  $\lim_{x \rightarrow 0^+} f(x) \neq 0$   
 (b)  $\lim_{x \rightarrow 0^-} f(x) \neq 0$   
 (c)  $f(x)$  is continuous at  $x=0$   
 (d) None of these

30. If  $f(x) = \begin{cases} x + \lambda, & x < 3 \\ 4, & x = 3 \\ 3x - 5, & x > 3 \end{cases}$  is continuous at  $x=3$ , then

- $\lambda =$   
 (a) 4 (b) 3  
 (c) 2 (d) 1