NEW STANDARD ACADEMY

Marks: 60

Date : 06-04-24 **CLASS : 11TH** **Time: 90min.**

PHYSICS

1. Find the value of λ in the unit vector $0.4\hat{\imath} + 0.8\hat{\jmath} + \lambda\hat{k}$.
   a) 3 c) 4
   b) $\sqrt{5}$ d) $\sqrt{0.2}$
2. Under a force of $10\hat{\imath} - 3\hat{\jmath} + 6\hat{k}$ newton, a body of mass 5 kg is displaced from the position $6\hat{\imath} + 5\hat{\jmath} - 3\hat{k}$ to the position $10\hat{\imath} - 2\hat{\jmath} + 7\hat{k}$ then work done.
   a) 121J c) 242 J
   b) 300J d) 800J
3. The diagonals of a parallelogram are given by $\overrightarrow{R_1} = 3\hat{\imath} + 2\hat{\jmath} - 7\hat{k}$. And $\overrightarrow{R_2} = 5\hat{\imath} + 6\hat{\jmath} - 3\hat{k}. Then$ the area of parallelogram.
   a) $\sqrt{509}$ c) 509
   b) $\sqrt{500}$ d) $\sqrt{405}$
4. Find $|\vec{A} \times \vec{B}| if\ |\vec{A}| = 10, |\vec{B}| = 2$ and $\vec{A}.\vec{B}$=1
   a) 16 c) 26
   b) 6 d) 36
5. If resultant of two vectors of equal magnitude is equal to the magnitude of either vector, then the angle between the two vectors is
   a) 30° c)90°
   b) 60° d)180°
6. Three vectors $\vec{A}, \vec{B}$ and $\vec{c}$ are represented by three sides of a triangle taken in same order. The resultant $\vec{R}$ is the resultant of these three vectors then
   a) R≠ 0 c) R=0
   b) R<0 d) R>0
7. A car moving towards south with a speed ϑ changes its direction and moves with same speed towards west. The change in the velocity of the car is
   a) ϑ along N-W c) $\sqrt{2}\,\vartheta$ along N-W
   b) ϑ along S-E d) $\sqrt{2}\,\vartheta$ along S-E
8. The angle between vectors $\vec{A} = \hat{\imath} + 2\hat{\jmath} - \hat{k}.$ and $\vec{B} = \hat{\imath} + \hat{\jmath} - 2\hat{k}$ is
   a) 30° c)90°
   b) 60° d)120°
9. If $\vec{A} = n\hat{\imath} - \hat{\jmath} + 2\hat{k}.$ and $\vec{B} = 2\hat{\imath} + 2\hat{\jmath} - \hat{k}$.are perpendicular to each other then value of n is
   a) 1 c) 2
   b) 3 d) 4
10. If resultant of two vectors $\vec{P}$ AND $\vec{Q}$ is $|\vec{P} - \vec{Q}|$ then angle between $\vec{P}$ AND $\vec{Q}$ is
    a) 30° c)90°
    b) 60° d)180°

CHEMISTRY

1. In hydrogen atom, energy of the first excited sate is -3.4eV. Then find out the KE of the same orbit of hydrogen atom:
   a) +3.4eV c) +6.8eV
   b) -13.6 eV d) +13.6eV
2. In a multi- electron atom, which of the following orbitals described by the three quantum number will have the same energy in the absence of magnetic and electric fields?
   1) n= 1, l=0, m=0
   2) n= 2,l=0, m=0
   3) n= 2, l=1, m=1
   4) n=3, l=2, m=1
   5) n=3, l=2,m=0
   a) 1) and 2) c) 2)and 3)
   b) 3) and 4) d) 4) and 5)
3. A gas absorbs a photon of 355 nm and emits two wavelengths. If one of the emissions is at 680nm the other is at:
   a) 518nm c) 1035nm
   b) 325nm d) 743nm
4. What is the maximum numbers of electrons that can be associated with the following set of quantum numbers? N=3, l=1 and m= -1
   a) 4 c) 2

b) 10 d) 6

5. What is the maximum number of orbitals that can be identified with the following quantum numbers?
   N= 3, l=1 and m=0
   a) 1 c) 2
   b) 3 d) 4
6. Calculate the energy in joules according to light of wavelength 45 nm. (Planck's constant, h=6.63× 10^{-34} Js, speed of light, c=3× $10^{8} ms^{-1}$
   a) 6.67× 10^{15} c) 6.67× 10^{11}
   b) 4.42× 10^{-15} d)4.42× 10^{-18}
7. Which of the following is the energy of a possible excited state of hydrogen?
   a) -3.4eV c) +6.8eV
   b) +13.6eV d) -6.8eV
8. The region in the electromagnetic spectrum where the balmer series lines appear is:
   a) Infrared c) ultraviolet
   b) Microwave d) visible
9. A certain orbital has no angular nodes and two radial nodes. The orbital is:
   a) 2s c) 3s
   b) 3p d) 2p
10. The shortest wavelength of hydrogen atom in lyman series is λ. The longest wavelength in balmer series of He^{+} is:
    a) $\frac{5}{9\lambda}$ c) $\frac{9\lambda}{5}$
    b) $\frac{5\lambda}{9}$ d) $\frac{36\lambda}{5}$

BIOLOGY

1. During anaphase –I of meiosis
   a) Homologous chromosomes separate
   b) Non-homologous autosomes separate
   c) Sister chromatids separate
   d) Non- Sister chromatids separate

2. G1,S and G2 phases are observed in
   a) Prophase c) Anaphase
   b) Interphase d) Metaphase
3. The stage when chiasmata are observed is
   a) Leptotene c) Zygotene
   b) Diplotene d) Pachytene
4. Name the phase of prophase I when synaptonemal complex dissolves , chromatids become clear and bivalents are called tetrads
   a) Pachytene c) Diakinesis
   b) Diplotene d) Zygotene
5. Events preceding re- formation of nuclear envelope during M-phase of cell cycle are
   a) Transcription from chromosomes and reassembly of nuclear lamina
   b) Formation of contractile ring and phragmoplast
   c) Decondensation of chromosomes and reassembly of nuclear lamina
   d) Formation of contractile ring and transcription from chromosomes
6. DNA replication occurs in
   a) G_1-phase c) G_2- phase
   b) S- phase d)G_0- phase

7. Synaptonemal complex is fromed during
   a) Zygotene c) Diakinesis
   b) Leptotene d) Pachytene

8. Yeast completes the cell cycle in
   a) 30 minutes c)90 minutes
   b) 60 minutes d)120 minutes
9. Arrange the following events of meiosis in correct sequence(a) Crossing over (b) Synapsis (c) Terminalisation of chiasmata(d) disappearance of nucleolus.
   a) b,a,d,c c) b,a,c,d
   b) a,b,c,d d) b,c,d,a
10. Which of the following options gives the correct sequences of events during mitosis
    a) Condensation → Nuclear membrane disassembly → Crossing over → segregation → telophase
    b) Condensation → Nuclear membrane →disassembly → Arrangement at equator→centromere division → segregation → telophase
    c) Condensation → Crossing over → Nuclear membrane disassembly →segregation→telophase
    d) Condensation → Arrangement at →equator→centromere division → →segregation → telophase

MATHS

1. Which of the following relation is a function.
   a) {(1,4)(2,6)(1,5)(3,9)}
   b) {(3,1)(3,2)(3,3)(3,4)}
   c) {(1,2) (2,2) (3,2)(4,2)}
   d) {(3,3)(2,1)(1,2)(2,3)}

2. The domain of f(x) = $\frac{log_2(x+3)}{x^2+3x+2}$ is
   a) R-{-1,-2}
   b) (-2,∞)
   c) R-{-1,2-3}
   d) (-3, ∞)-{-1,-2}
3. The domain of the function
   f(x)=$\sqrt{x-\sqrt{1-x^2}}$ is
   a) $\left[-1\frac{-1}{\sqrt{2}}\right] \cup \left[\frac{1}{\sqrt{2}}\ 1\right]$
   b) $[-1,1]$
   c) $\left(-\infty,\frac{-1}{\sqrt{2}}\right] \cup \left[\frac{1}{\sqrt{2}},\infty\right)$
   d) $\left[\frac{1}{\sqrt{2}}\ 1\right]$
4. If f(x) = $\begin{cases} x+3, x<1 \\ x^2, 1 \le x \le 3 \\ 2-3x, x>3 \end{cases}$ then which of the following is the greatest?
   a) f(0) c) f(4)
   b) f(3) d) f(2)
5. Find 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.
   a) b = 5,c = 1
   b) B=-5,c = -1
   c) B =4, c=-1
   d) B= -4, c =1
6. If f(x) = x^2, find $\frac{f(1.1)-f(1)}{(1.1-1)}$
   a) 2.1 c) 2.2
   b) 3.1 d) 3.2
7. The domain of the fraction $f(x) = \left[log_{10\left(\frac{5x-x^2}{4}\right)}\right]^{1/2}$ is
   a) $-\infty < x < \infty$ c) $1 \le x \le 4$
   b) $4 \le x \le 16$ d) $-1 \le x \le 1$
8. The range of f(x) = [sin x+[cos x+[tan x+[sec x]]]],x∈ $(0,\frac{\pi}{4})$,where[.] denotes the greatest integer function$\le x$,is
   a) {0,1} c) {-1,0,1}
   b) {1} d) None of these
9. The domain of $f(x) = \cos^{-1}\left(\frac{2-|x|}{4}\right) + [\log(3-x)]^{-1} is$
   a) [-2,6] c) [-6,2)∪(2,3)
   b) [-6,2] d) [-2,2] ∪ (2,3)
10. Let A=$\{x \in R: -9 \le x < 4\}$, B = $\{x \in R: -13 < x \le 5\}$ and C = $\{x \in R: -7 \le x \le 8\}$ then , which one of the following in correct.
    a) -9∈ $(A \cap B \cap C)$
    b) -7∈ $(A \cap B \cap C)$
    c) 4∈ $(A \cap B \cap C)$
    d) 5∈ $(A \cap B \cap C)$

STANDARD ACADEMY RAE BARELI
असतो मा सद्गमय