

## Section - I

## PHYSICS

Let the angle between two nonzero vectors  $\vec{A}$  and  $\vec{B}$  be  $120^\circ$  and resultant be  $\vec{C}$

- (a)  $\vec{C}$  must be equal to  $|\vec{A} - \vec{B}|$  (b)  $\vec{C}$  must be less than  $|\vec{A} - \vec{B}|$   
 (c)  $\vec{C}$  must be greater than  $|\vec{A} - \vec{B}|$  (d)  $\vec{C}$  may be equal to  $|\vec{A} - \vec{B}|$
2. The vector sum of two forces is perpendicular to their vector differences. In that case, the forces  
 (a) Are equal to each other in magnitude (b) Are not equal to each other in magnitude  
 (c) Cannot be predicted (d) Are equal to each other
3. How many minimum number of non-zero coplanar vectors having different magnitudes can be added to give zero resultant  
 (a) 2 (b) 3  
 (c) 4 (d) 5
4. A body sliding on a smooth inclined plane requires 4 seconds to reach the bottom starting from rest at the top. How much time does it take to cover one-fourth distance starting from rest at the top (assume it is uniformly accelerating down)  
 (a) 1 s (b) 2 s  
 (c) 4 s (d) 16 s
5. A body thrown vertically upwards with an initial velocity  $u$  reaches maximum height in 6 seconds. The ratio of the distances travelled by the body in the first second and the seventh second is  
 (a) 1 : 1 (b) 11 : 1  
 (c) 1 : 2 (d) 1 : 11
6. A very large number of balls are thrown vertically upwards in quick succession in such a way that the next ball is thrown when the previous one is at the maximum height. If the maximum height is 5m, the number of ball thrown per minute is (take  $g = 10 \text{ms}^{-2}$ )  
 (a) 120 (b) 80  
 (c) 60 (d) 40
7. The coordinates of a moving particle at any time are given by  $x = at^2$  and  $y = bt^2$ . The speed of the particle at any moment is \_\_\_\_.  
 (a)  $2t(a+b)$  (b)  $2t\sqrt{(a^2 - b^2)}$   
 (c)  $t\sqrt{a^2 + b^2}$  (d)  $2t\sqrt{(a^2 + b^2)}$
8. A particle starts moving rectilinearly at  $t = 0$  such that its velocity as function of time is  $v = t^2 - t$ , where  $v$  is in  $\text{ms}^{-1}$  and  $t$  is in seconds. The time interval in which the particle decelerates is \_\_\_\_  
 (a)  $t > 1 \text{ s}$  (b)  $t < \frac{1}{2}$   
 (c)  $\frac{1}{2} \text{ s} < t < 1 \text{ s}$  (d)  $t < \frac{1}{2} \text{ s}$  and  $t > 1 \text{ s}$
9. A particle is projected with a velocity  $v$  such that its range on the horizontal plane is twice the greatest height attained by it. The range of the projectile is (where  $g$  is acceleration due to gravity)

(a)  $\frac{4v^2}{5g}$

(b)  $\frac{4g}{5v^2}$

(c)  $\frac{v^2}{g}$

(d)  $\frac{4v^2}{\sqrt{5}g}$

10. A ball of mass  $m$  is thrown vertically upwards. Another ball of mass  $2m$  is thrown at an angle  $\theta$  with the vertical. Both of them stay in air for same period of time. The heights attained by the two balls are in the ratio of

(a) 2 : 1

(b) 1 :  $\cos\theta$

(c) 1 : 1

(d)  $\cos\theta : 1$

### Section - III CHEMISTRY

11. At low pressure, the Vander waal's equation is written as:

(a)  $\frac{PV}{RT} = \left[ 1 - \frac{a}{RTV} \right]$

(b)  $\frac{PV}{RT} = \left[ 1 - \frac{RTV}{a} \right]$

(c)  $\frac{PV}{RT} = \left[ 1 + \frac{a}{RTV} \right]$

(d)  $\frac{PV}{RT} = \left[ 1 + \frac{RTV}{a} \right]$

12. Aspirin has the molecular formula  $C_9H_8O_4$ . How many atoms of oxygen are there in a tablet weighing 360 mg?

(a)  $1.204 \times 10^{23}$

(b)  $1.08 \times 10^{22}$

(c)  $1.204 \times 10^{24}$

(d)  $4.81 \times 10^{21}$

13. One mol. of equimolar mixture of ferric oxalate and ferrous oxalate is to be completely oxidized by  $KMnO_4$  solution in acidic medium. Find the volume of  $10^{-2}M$   $KMnO_4$  solution required for this oxidation \_\_\_\_

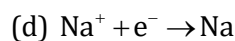
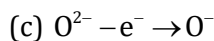
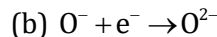
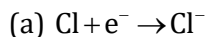
(a) 90 L

(b) 45 L

(c) 60 L

(d) 30 L

14. In which of the following processes energy is absorbed?



15. Aspirin contains 35.55%  $\left(\frac{w}{w}\right)$  of oxygen. If each molecule of oxygen has four oxygen atoms, the mol. mass of aspirin is \_\_\_\_.

(a) 120u

(b) 180u

(c) 240u

(d) 90u

16. What is the volume of water mixed in 500 ml 0.5 M NaOH solution so that its concentration becomes 10 mg NaOH per ml?

(a) 100 ml

(b) 200 ml

(c) 250 ml

(d) 500 ml

17. If 3L of 0.1 M HCl is added to 2 L of 0.5 M HCl, calculate the molarity of resultant solution?

# RISE SCHOLARSHIP – ADMISSION TEST – SAMPLE PAPER

## CLASS – 11<sup>th</sup> to 12<sup>th</sup>



- (a) 0.48 (b) 0.26  
(c) 0.12 (d) 0.4
18.  $\text{FeS} + \text{KMnO}_4 \longrightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{MnO}$  in this reaction the equivalent mass of FeS is \_\_\_\_
- (a) M/8 (b) M/7  
(c) M/6 (d) M/5
19. It requires 40 ml of 0.5 M  $\text{Ce}^{4+}$  to titrate 10 ml of 1.0M  $\text{Sn}^{2+}$  to  $\text{Sn}^{4+}$ . The oxidation state of Ce in the reduction product is \_\_\_\_
- (a) +2 (b) +3  
(c) +6 (d) +1
20. An isostructural pair is \_\_\_\_
- (a)  $\text{XeO}_3, \text{SO}_3$  (b)  $\text{CF}_4, \text{SF}_4$   
(c)  $\text{XeO}_3, \text{NH}_3$  (d)  $\text{PF}_5, \text{BrF}_5$

### Section – IV BIOLOGY

21. Taxonomy is the branch of biology concerned with naming and classifying the diverse forms of life. The person who is considered to be the founder of taxonomy is:
- (a) Carolus Linnaeus (b) Charles Darwin  
(c) Alfred Wallace (d) Ernst Mayr
22. Home canners pressure cook vegetables as a precaution primarily against –
- (a) mycoplasmas (b) enteric bacteria  
(c) endospore forming bacteria (d) actinomycetes
23. Plant like photosynthesis that relates  $\text{O}_2$  occurs in the –
- (a) chemoautotrophic bacteria (b) cyanobacteria  
(c) methanogens (d) both (a) and (b)
24. Which one of the following characters is NOT common to all divisions of vascular plants?
- (a) Alternation of generations (b) Dominance of diploid generation  
(c) Presence of xylem and phloem tissues (d) Development of seeds
25. Read the two statements given below and choose the correct answer.  
Statement-1: The fruit could be described as a mature ovary.  
Statement-2: Fruits are characteristic feature of angiosperms and gymnosperms.
- (a) Statement-1 and Statement-2 are both correct statements.  
(b) Statement-1 is correct, but Statement-2 is incorrect.  
(c) Statement-1 is incorrect, but Statement-2 is correct.  
(d) Both Statements 1 and 2 are incorrect.
26. 'Gourmet fungi' refer to fungi that are consumed by humans and often used as flavouring agents. These include the –
- (a) morels and truffles (b) puff balls and mushrooms

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## CLASS – 11<sup>th</sup> to 12<sup>th</sup>



- (c) chytrids and bracket fungi (d) pink moulds and blue moulds
27. Choose the correct pair.
- (a) Cellular grade of organization – Coelenterates  
(b) Water vascular system – Poriferans  
(c) Triploblastic, acoelomate animals – Platyhelminthes  
(d) 2<sup>nd</sup> largest phylum – Arthropoda
28. Only an animal species with a diaphragm can be expected to have –
- (a) scales (b) lungs  
(c) moist skin (d) hair
29. The edible part is stem in all the following except –
- (a) Ginger (b) Sweet potato  
(c) *Colocasia* (d) *Amorphophallus* (Zaminkand)
30. Choose the set of plants that are medicine yielding plants.
- (a) Aloe, Ashwagandha, Muliathi (b) Belladonna, Sesbania, Asparagus  
(c) Colchicum, Petunia, Trifolium (d) Indigofera, Belladonna, Gloriosa
31. Which of the cell organelles is common to both plant and animal cells?
- (a) Plastids (b) Centrioles  
(c) Mitochondria (d) Large vacuoles
32. Choose the mismatched pair.
- (a) Nucleolus – Site of synthesis of rRNA (b) Lysosome – Intracellular digestion  
(c) Ribosome – Site of protein synthesis (d) Microtubules – Muscle contraction
33. Which one of the following is NOT found within mitochondria?
- (a) 70 S ribosome (b) grana  
(c) a single circular DNA (d) cristae
34. Vinblastine is a standard anticancer drug. It interferes with the assembly of microtubules. Therefore, the effectiveness of the drug must be related to –
- (a) inhibition of splitting of centromere and separation of chromatids  
(b) prevention of formation of cleavage furrow  
(c) disruption of formation of mitotic spindle formation  
(d) disruption of duplication of DNA during S phase of interphase
35. The DNA content of a diploid cell in the G<sub>1</sub> phase of cell cycle was measured and was found to be equal to  $y$ . The DNA content of the same cell at metaphase of meiosis I would be –
- (a)  $0.25y$  (b)  $4y$   
(c)  $0.5y$  (d)  $2y$

### Section – V Aptitude

# RISE SCHOLARSHIP – ADMISSION TEST – SAMPLE PAPER

## CLASS – 11<sup>th</sup> to 12<sup>th</sup>



36. 4, 6, 9,  $13\frac{1}{2}$ , ?
- (a)  $17\frac{1}{2}$  (b) 19
- (c)  $20\frac{1}{4}$  (d)  $22\frac{3}{4}$
37. 9360, 1560, 312, 78, 26, ?
- (a) 4 (b) 13
- (c) 2 (d) 5
38. NOS, OQV, PSY, QUB, ?
- (a) SWE (b) RWE
- (c) RVE (d) RWF
39. XLR, YKS, ZJT, AIU, ?
- (a) BHV (b) CHV
- (c) BIV (d) BHW
40. --stLLts--Lt--L-tst-
- (a) LstsLtLs (b) LtLtstLt
- (c) LttLstLL (d) LLLtstLt
41. Find the odd-numeral pair.
- (a) 8 – 27 (b) 125 – 216
- (c) 343 – 512 (d) 1009 – 1331
42. Find the odd-numeral pair.
- (a) 72 – 45 (b) 51 – 24
- (c) 47 – 20 (d) 32 – 13
43. Find the odd-numeral pair.
- (a) 13 – 21 (b) 19 – 27
- (c) 15 – 23 (d) 16 – 24
44. In a certain code language, STRING is written as % = \*4+÷ and PRAISE as ?\*@4%x How will the word GRAPES be written in that code language,?
- (a) ÷\*@x?% (b) ÷@\*? x %
- (c) ÷\*@ ?x% (d) ÷\*~?x%
45. Analogy find the missing the number 20 : 11 :: 102 : ?
- (a) 49 (b) 52
- (c) 61 (d) 98

### ANSWER KEY

1. B	2. A	3. B	4. B	5. B	6. C	7. D	8. C	9. A	10. C
11. A	12. D	13. A	14. B	15. B	16. D	17. B	18. B	19. B	20. C
21. A	22. C	23. B	24. D	25. B	26. A	27. C	28. D	29. B	30. A

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## CLASS – 11<sup>th</sup> to 12<sup>th</sup>



31. C	32. D	33. B	34. C	35. D	36. C	37. B	38. B	39. A	40. C
41. D	42. D	43. D	44. C	45. B	46.	47.	48.	49.	50.