

ELITE 20

PRE- FOUNDATION COURSE CLASS – X

SAMPLE PAPER

PLEASE READ THE INSTRUCTIONS CAREFULLY

A. GENERAL

1. This booklet is your question paper.
2. This question paper contains **25** questions.
3. This question paper contains blank pages for your rough work.
4. Blank papers, clip boards, log tables, slide rule, calculators, cellular phones or any other electronic items, in any form are NOT allowed.
5. Write your Roll Number and Name on Question Paper and before answering the Question paper fill up the required details in the blank space provided in the Answer sheet.

B. ANSWERING

1. Every question has 4 choices for its answer (1), (2), (3) and (4).
2. Only one of them is the right answer.

C. MARKING SCHEME

1. For each correct answer carries **3** marks. There will be **negative marking**. For each wrong answer **-0.5** marks will be deducted.

JRS TUTORIALS

“JRS BHAWAN”, DURGAKUND, VARANASI – 221005

PHONE: (0542) – 2311922, 2311777

Website: www.jrstutorials.ac.in

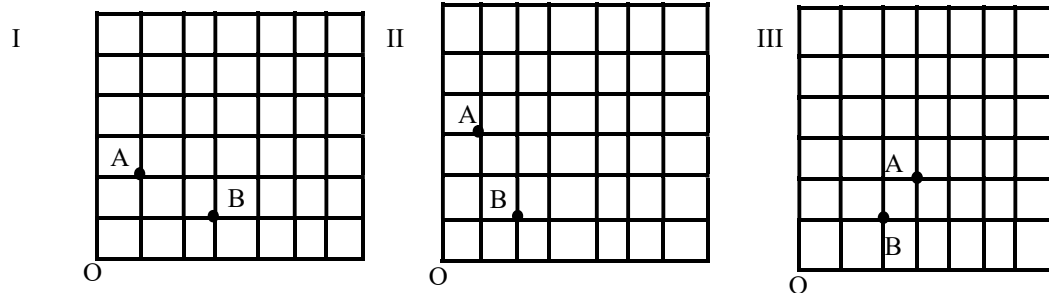


1. Four surds are given accordingly:

$$p = \sqrt{12} + \sqrt{13}, q = \sqrt{10} + \sqrt{15}, r = \sqrt{8} + \sqrt{17}, s = \sqrt{6} + \sqrt{19}$$

The correct ascending order is:

1. $r < s < p < q$ 2. $s < r < q < p$ 3. $s < r < p < q$ 4. $p < r < q < s$
2. How many isosceles triangles with integral sides can be formed such that the perimeter is 22?
 1. 3 2. 5 3. 7 4. 9
3. If $a = \sqrt{3} + 1$, the value of $a^4 - 6a^2 + 8a$ is
 1. $12a - 3$ 2. $12a$ 3. $4a$ 4. $8a - 3$
4. A boy travelled in the rectangular coordinate system whose centre is O (origin) from point O to A and then A to B, from 3 different routes. In which case distance and displacement are maximum:



- | | Distance | Displacement |
|----|----------|--------------|
| 1. | I | II |
| 2. | III | I |
| 3. | II | I |
| 4. | I | I |

5. If $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{1}{x+y+z}$. Then what is the value of k, if $(x+y)(y+z)(z+x) = kxyz$?

1. 0 2. 1 3. 3 4. 8

6. Let $f(x)$ be a polynomial of degree 51 such that when $f(x)$ is divided by $(x - 1), (x - 2), (x - 3) \dots$ and $(x - 51)$, it leaves 1, 2, 3, ... and 51 respectively, as the remainders. Find the value of $f(52) + f(0)$.

1. 52 2. 101 3. 100 4. 0

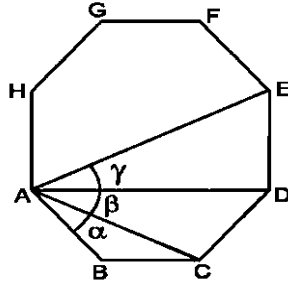
7. In a regular polygon, the number of diagonals is 'k' times the number of sides. If the interior angle of the polygon is θ , then the value of k is

1. $\frac{3\theta - \pi}{2(\pi - \theta)}$ 2. $\frac{2(3\theta - \pi)}{\pi - \theta}$ 3. $\frac{2(\pi - \theta)}{3\theta - \pi}$ 4. $\frac{(\pi - \theta)}{2(3\theta - \pi)}$

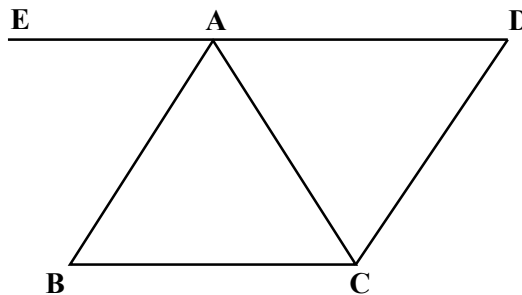


8. If $(ax + b) + \frac{3}{(ax + b)} = 2$, then the value of $(ax + b)^3 - (ax + b)$ is
1. -2
 2. -6
 3. -3
 4. None of these

9. The figure given below shows a regular octagon ABCDEFGH. The measure (in degrees) of $\angle BAC$, $\angle CAD$ and $\angle DAE$ are α, β and γ respectively. What is the ratio $\alpha : \beta : \gamma$?



1. 1:1:1
 2. 2:1:3
 3. 1:2:3
 4. None of these
10. In the figure given below, if $AB = AC = AD$, $\angle BAE = 72^\circ$ and $\angle ABC = 2\angle ADC$, find $\angle ACD$.



1. 18°
 2. 24°
 3. 36°
 4. 42°
11. If you are provided with root-tips of onion in your class and are asked to count the chromosomes, which of the following stages can you most conveniently look into?
1. Metaphase
 2. Telophase
 3. Anaphase
 4. Prophase
12. When paternal and maternal chromosomes change their materials with each other in cell division this event is called
1. bivalent-forming
 2. Dyad-forming
 3. Synapsis
 4. Crossing-over
13. A person met with an accident in which two long bones of hand were dislocated. Which among the following may be the possible reason?
1. Tendon breaks
 2. Break of skeletal muscle
 3. Ligament breaks
 4. Areolar tissue break
14. Which of the following are characteristics of prokaryotic cells?
- (i) Nucleolus is absent
 - (ii) It contains single chromosome
 - (iii) Cell division occurs by mitotic or meiotic cell division
 - (iv) Size of cell is generally large (5-100 mm).
1. (i) and (iv)
 2. (i) and (ii)
 3. (i), (ii) and (iii)
 4. (iii) and (iv)



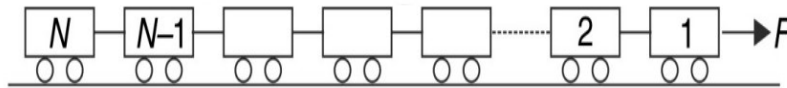
15. Which of the following are characteristics of unicellular organisms?

- (i) There is no division of labour.
- (ii) Life span of organism is long.
- (iii) Reproduction consumes the whole cell
- (iv) Single cell performs one or few activities of the organism.

Select the correct option.

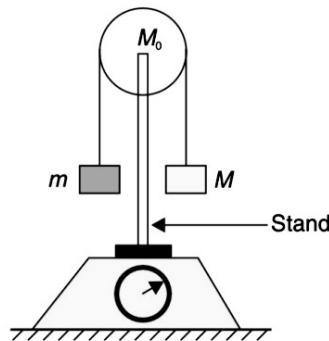
- 1. (i) and (ii)
- 2. (ii) and (iii)
- 3. (i) and (iii)
- 4. (iv) and (i)

16. N identical carts are connected to each other using strings of negligible mass. A pulling force F is applied on the first cart and the system moves without friction along the horizontal ground. The tension in the string connecting 4th and 5th cart is twice the tension in the string connecting 8th and 9th cart. Find the tension in last string.



- 1. $\frac{F}{4}$
- 2. $\frac{F}{8}$
- 3. $\frac{F}{12}$
- 4. $\frac{F}{16}$

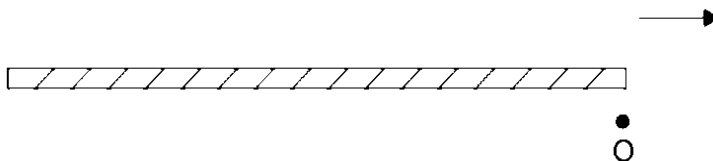
17. A pulley is mounted on a stand which is placed over a weighing scale. The combined mass of the stand and the pulley is M_0 . A light string passes over the smooth pulley and two masses m and M ($> m$) are connected to its ends (see figure). Find the reading of the scale when the two masses are left free to move.



- 1. $\frac{Mmg}{M+m} + M_0g$
- 2. $\frac{2Mmg}{M+m} + M_0g$
- 3. $\frac{4Mmg}{M+m} + M_0g$
- 4. $\frac{8Mmg}{M+m} + M_0g$



18. A rope is lying on a table with one of its end at point O on the table. This end of the rope is pulled to the right with a constant acceleration starting from rest. It was observed that last $2m$ length of the rope took $5s$ in crossing the point O and the last $1m$ took $2s$ in crossing the point O .



Find the time required by the complete rope to travel past point O .

1. 5.5 sec. 2. 6.5 sec 3. 7.5 sec 4. 8.5 sec
19. Two tourists A and B who are at a distance of 40 km from their camp must reach it together in the shortest possible time. They have one bicycle and they decide to use it in turn. ' A ' started walking at a speed of 5 km hr^{-1} and B moved on the bicycle at a speed of 15 km hr^{-1} . After moving certain distance B left the bicycle and walked the remaining distance. A , on reaching near the bicycle, picks it up and covers the remaining distance riding it. Both reached the camp together. Find the average speed of each tourist.
1. $\langle V_A \rangle = 15\text{ km/hr}$ 2. $\langle V_A \rangle = 5\text{ km/hr}$
 $\langle V_B \rangle = 5\text{ km/hr}$ $\langle V_B \rangle = 15\text{ km/hr}$
3. $\langle V_A \rangle = 7.5\text{ km/hr}$ 4. $\langle V_A \rangle = 6\text{ km/hr}$
 $\langle V_B \rangle = 7.5\text{ km/hr}$ $\langle V_B \rangle = 6\text{ km/hr}$
20. Two lead balls of mass m and $2m$ are placed at a separation d . A third ball of mass m is placed at an unknown location on the line joining the first two balls such that the net gravitational force experienced by the first ball is $\frac{6Gm^2}{d^2}$. What is the location of the third ball?
1. $d/3$ from m 2. $2d/3$ from $2m$
 3. $d/2$ from m 4. $d/4$ from $2m$
21. An atom absorb light of wavelength 200 nm then released three wavelength having $\lambda_1 = 900\text{ nm}$, $\lambda_2 = 600\text{ nm}$ what is λ_3
1. -300 nm . 2. 450 nm . 3. 500 nm . 4. 200 nm .
22. Wavelength of light are λ , $\frac{\lambda}{2}$, $\frac{3\lambda}{4}$ having frequency ν_1 , ν_2 , ν_3 respectively then $\nu_1:\nu_2:\nu_3$ is.
1. $1:\frac{1}{2}:\frac{3}{4}$ 2. $3:6:4$ 3. $4:2:3$ 4. $3:4:6$
23. 1 L of aqueous solution of H_2SO_4 contains 40% of acid by mass. Density of solution is 1.4 g/mL . In this solution 1 L water is added. Density of water is 1 g/mL . Mark the incorrect statement about diluted solution
1. Density is 1.2 g/mL 2. Molarity is 2.86
 3. Molality is 4.10 4. Percentage of acid by mass is 23.3

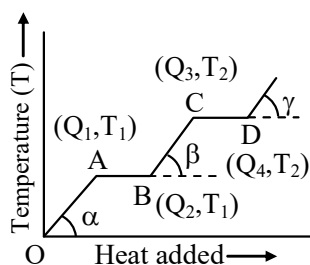


24. The table shows the effect of temperature on the solubility of three substances in 100 ml of solution in gms.

Substance	0°C/273 K	40°C/313K	80°C/353K
CuSO ₄	14gm	29gm	55 gm
KNO ₃	14gm	29 gm	55 gm
NaCl	36gm	36gm	38 gm

200 gm of CuSO₄ was added to 200 mL of water at 80°C and then stirred until no more solute dissolved. How much CuSO₄ would remain undissolved?

1. 145 gm 2. 90 gm 3. 55 gm 4. 45 gm
25. The accompanying graph shows the variation of temperature (T) of one kilogram material with Heat (Q) supplied to it. At O, the substance is in solid state. Which of the following interpretation from the graph is correct –?



- T_2 is the melting point of the solid
- BC represents the change of state from solid to liquid.
- $(Q_2 - Q_1)$ represent the latent heat of fusion of the substance.
- $(Q_3 - Q_1)$ represents the latent heat of vaporisation of the liquid.

