RISE SCHOLARSHIP – ADMISSION TEST – SAMPLE PAPER

CLASS – 10th to 11th

Rani Institute of Scholastic Education

Section – I

MATHEMATICS

1. $2022^3 - 2021 \times 2022 \times 2023 =$ _____

   (a) 2021 (b) 2022

   (c) 1 (d) 0

2. Real numbers a, b, c satisfying the equations $a+b+c=26$ and $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=28$ then the value of $\frac{a}{b}+\frac{b}{c}+\frac{c}{a}+\frac{a}{c}+\frac{c}{b}+\frac{b}{a}=$

   (a) 746 (b) 625

   (c) 728 (d) 725

3. Given 3 different prime numbers p,q,r such that $p+q+r=100$ and $p<q<r$. If r is the largest possible value then the value of $(-1)^{p-1}(p-1)+(-1)^{q}(q)+(-1)^{r+1}(r+1)$ is

   (a) 77 (b) 60

   (c) 82 (d) 75

4. If $a^b = 125$, where a & b are prime, then the value of $(a-b)^{a+b-4}$ is

   (a) 16 (b) 18

   (c) 25 (d) 9

5. If A (– 2, – 1), B(a, 0), C(4, b) and D(1, 2) are the vertices of a parallelogram, then a + b =

   (a) 2 (b) – 2

   (c) 4 (d) – 4

6. The units digit of $(1+9+9^2+9^3+9^4.....+9^{2022})$ is

   (a) 0 (b) 1

   (c) 9 (d) 3

7. If 3, 5, x are the sides of an integer sided obtuse angle triangle, the number of such triangles is

   (a) 0 (b) 3

   (c) 4 (d) infinite

8. If $f(x)=x^4+x^3+x^2+x+1$, then the remainder when $f(x^{11})$ is divided by $f(x)$ is

   (a) 0 (b) x

   (c) $x+1$ (d) x^2+2x+1

9. If $\left(x+\frac{1}{x}\right)=3$, then $\left(x^5+\frac{1}{x^5}\right)$ is equal to

   (a) 192 (b) 198

   (c) 195 (d) 243

10. In ΔABC, $BC = a, CA = b, AB = c$. and h_a, h_b, h_c are the heights from A, B, C to the opposite sides BC, CA, AB respectively. If $\frac{2}{h_b} = \frac{1}{h_a} + \frac{1}{h_c}$ then the value of $\frac{(a-b)^2 + (b-c)^2}{(a-c)^2}$ is

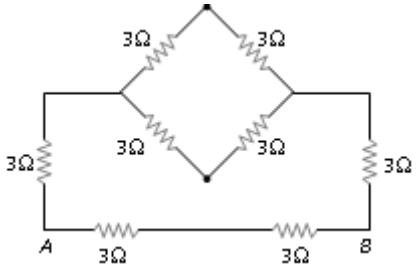
(a) 1 (b) $\frac{1}{2}$

(c) 2 (d) $\frac{1}{4}$

Section – II

PHYSICS

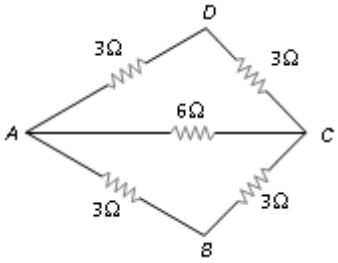
11. Equivalent resistance between *A* and *B* will be –



(a) 2 *ohm* (b) 18 *ohm*

(c) 6 *ohm* (d) 3.6 *ohm*

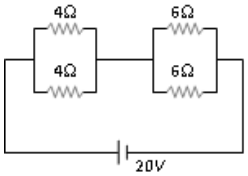
12. The effective resistance between the points *A* and *B* in the figure is –



(a) 5 Ω (b) 2 Ω

(c) 3 Ω (d) 4 Ω

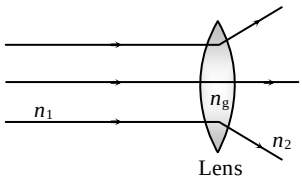
13. Four resistances are connected in a circuit in the given figure. The electric current flowing through 4 *ohm* and 6 *ohm* resistance is respectively –



(a) 2 *amp* and 4 *amp* (b) 3 *amp* and 2 *amp*

(c) 1 *amp* and 1 *amp* (d) 2 *amp* and 2 *amp*

14. An electric lamp is marked 60 *W*, 230 *V*. The cost of a 1 *kWh* of energy is *Rs*. 1.25. The cost of using this lamp 8 *hrs* a day for 30 day is _____.
    (a) Rs. 10 (b) Rs. 16
    (c) Rs. 18 (d) Rs. 20
15. A concave mirror is used to focus the image of a flower on a nearby well 120 cm from the flower. If a lateral magnification of 16 is desired, the distance of the flower from the mirror should be –
    (a) 8 cm (b) 12 cm
    (c) 80 cm (d) 120 cm
16. Radius of curvature of concave mirror is 40 cm and the size of image is twice as that of object, then the object distance is _____.
    (a) 60 cm (b) 20 cm
    (c) 40 cm (d) 30 cm
17. A point object is placed at a distance of 30 *cm* from a convex mirror of focal length 30*cm.* The image will form at
    (a) Infinity (b) Focus
    (c) Pole (d) $f/2$
18. A person sees his virtual image by holding a mirror very close to the face. When he moves the mirror away from his face, the image becomes inverted. What type of mirror he is using?
    (a) Plane mirror (b) Convex mirror
    (c) Concave mirror (d) None of these
19. Two lenses are placed in contact with each other and the focal length of combination is 80 *cm*. If the focal length of one is 20 *cm*, then the power of the other will be –
    (a) 1.66 *D* (b) 4.00 *D*
    (c) –1.00 *D* (d) – 3.75 *D*
20. The ray diagram could be correct –
    (a) If $n_1 = n_2 = n_g$
    (b) If $n_1 = n_2$ and $n_1 < n_g$
    (c) If $n_1 = n_2$ and $n_1 > n_g$
    (d) Under no circumstances



Section – III
CHEMISTRY

21. Which of the following is not a combination reaction?
    (a) $C + O_2 \longrightarrow CO_2$ (b) $H_2 + O_2 \longrightarrow H_2O$
    (c) $CH_4 + O_2 \longrightarrow CO_2 + H_2O$ (d) All of these
22. Which will be an endothermic reaction?
    (a) $N_2 + 3H_2 \longrightarrow 2NH_3$ (b) $CaO + CO_2 \longrightarrow CaCO_3$

(c) $SO_3 \longrightarrow SO_2 + O_2$ (d) $H_2 + O_2 \longrightarrow H_2O$

23. Zinc sulphide heating with Aluminum phosphide gives zinc phosphide and aluminium sulphide. On balancing this reaction, the coefficient of Zinc sulphide and Aluminum phosphide, will be in the ratio

(a) 1 : 1 (b) 2 : 1

(c) 3 : 2 (d) 2 : 3

24. $FeC_2O_4 + KMnO_4 + H_2SO_4 \longrightarrow Fe_2(SO_4)_3 + K_2SO_4 + MnSO_4 + CO_2 + H_2O$

On balancing this reaction, with smallest possible whole numbers, the coefficient of CO_2 will be

(a) 2 (b) 12

(c) 24 (d) 20

25. $SO_2 + O_2 \longrightarrow SO_3$ In the above reaction

(a) Sulphur is oxidised (b) Oxygen is oxidised

(c) Oxygen is reduced (d) Both (a) and (c)

26. $Fe_2O_3 + Cr \longrightarrow Cr_2O_3 + Fe$ in the above reaction, reducing agent is

(a) Iron (b) Chromium

(c) Oxygen (d) It is not a redox reaction

27. Which of the following reaction will change the color of the solution to colourless?

(a) $CuSO_4 + Fe$ (b) $FeSO_4 + Cu$

(c) $CuSO_4 + Zn$ (d) $FeSO_4 + Ag$

28. Which among the following metals has as the least oxidising properties?

(a) Fe (b) Zn

(c) Al (d) Cu

29. The solution which turns blue litmus to red may have a pOH of

(a) 13 (b) 7

(c) 2 (d) All of these

30. The acidic salt among the following is

(a) Na_2CO_3 (b) $KHCO_3$

(c) $NaHSO_4$ (d) NH_4NO_3

Section – IV

Aptitude

31. Find the missing number/letter.

4, 6, 9, $13\frac{1}{2}$, ?

(a) $17\frac{1}{2}$ (b) 19

(c) $20\frac{1}{4}$ (d) $22\frac{3}{4}$

32. Find the missing number/letter.
9360, 1560, 312, 78, 26, ?
(a) 4 (b) 13
(c) 2 (d) 5

33. Find the missing number/letter.
NOS, OQV, PSY, QUB, ?
(a) SWE (b) RWE
(c) RVE (d) RWF

34. Find the missing number/letter.
X L R, Y K S, Z J T, A I U, ?
(a) B H V (b) C H V
(c) B I V (d) B H W

35. Find the missing number/letter.
– – s t L L t s – – L t – – L – t s t –
(a) L s t s L t L s (b) L t L t s t L t
(c) L t t L s t L L (d) L L L t s t L t

36. Find the odd-numeral pair.
(a) 8 – 27 (b) 125 - 216
(c) 343 – 512 (d) 1009 - 1331

37. Find the odd-numeral pair.
(a) 72 – 45 (b) 51 – 24
(c) 47 – 20 (d) 32 – 13

38. Find the odd-numeral pair.
(a) 13 – 21 (b) 19 – 27
(c) 15 – 23 (d) 16 – 24

39. 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%

40. Analogy find the missing the number 20 : 11 : : 102 : ?
(a) 49 (b) 52
(c) 61 (d) 98

ANSWER

1. C	2. D	3. B	4. A	5. C	6. B	7. B	8. A	9. C	10. B
11. D	12. B	13. D	14. C	15. A	16. D	17. D	18. C	19. D	20. C
21. C	22. C	23. C	24. D	25. D	26. B	27. C	28. C	29. A	30. D
31. C	32. B	33. B	34. A	35. C	36. D	37. D	38. D	39. C	40. B