## MATHEMATICS

1.	Four-fifth of one-eighth of	of $\left(\frac{3}{4}\right)^{\text{th}}$ of x is 64 what is	the cube root of $\left(\frac{3}{5}\right)^{\text{th}}$ of x	x?
	(a) 5	(b) 8	(c) 3	(d) 4
2.	What is the least perfect s	square which is divisible by	y 2, 4 and 6?	
	(a) 36	(b) 64	(c) 16	(d) 18
3.	Simplify: $\frac{\frac{2}{9} \left(1\frac{2}{3} - \frac{3}{8} \text{ of } 1\right)}{\frac{3}{4} \times 1\frac{4}{7} \div 1\frac{1}{2}}$	$\frac{\frac{4}{9}}{-\frac{11}{28}} + \frac{\frac{4}{17}}{\frac{3}{4} + \frac{2}{3}}{\frac{3}{4} - \frac{2}{3}}$		
	(a) 18	(b) 19	(c) 21	(d) 0
4.	If $(504 + p)$ is a perfect cu	ube number, whose cube ro	pot is p, then $p = ?$	
	(a) 6	(b) 4	(c) 2	(d) 8
5.	If $x + \frac{1}{x} = 5$ then the value	the of $x^4 + \frac{1}{x^4}$ is:		
	(a) 526	(b) 527	(c) 528	(d) 529
6.	The difference between t numbers is 5, then the cu	the squares of two number be of the larger number is:	rs is 275. If the square roo	ot of the smaller of the two
	(a) 64000	(b) 216000	(c) 1728000	(d) 27000
7.	Find the number of coins, each of which is 1.5 cm in diameter and 0.2 cm thick, required to form a right circular cylinder of height 10 cm and diameter 4.5 cm:			ck, required to form a right
	(a) 450	(b) 250	(c) 350	(d) 400
8.	A sum of money placed a to eight times itself?	at compound interest doubl	les itself in 4 years. In how	w many years will it amount
	(a) 10 years	(b) 12 years	(c) 14 years	(d) 16 years
9.	By selling 33 meters of cl	loth, one gains the selling p	price of 11 metres. Then th	e gain percent is:
	(a) 50%	(b) 25%	(c) 45%	(d) 60%
10.	One of the factor of $a^2 - a^2$	$2ab - c^2 + b^2$ is:		
	(a) $a - b + 2c$	(b) $a + b - c$	(c) $a+b+c$	(d) $a-b+c$
11.	If the area of a rectangula	ar field is $(x^4 + x^2 + 1)$ sq. (	units, then its perimeter is:	
	(a) $2(x^2 + x + 1)$	(b) $4(x^2+1)$	(c) $2(x^2+1)$	(d) $6(x^2+1)$



Genius 20 / 22 Jan. 2023 / Class 8<sup>th</sup> moving to Class 9<sup>th</sup>

# 12. The value of $\frac{(x^{a+b})^2 \times (x^{b+c})^2 \times (x^{c+a})^2}{(x^a \cdot x^b \cdot x^c)^4} - \left[ \left( \frac{x^a}{x^b} \right)^{c+d} \times \left( \frac{x^b}{x^c} \right)^{d+a} \times \left( \frac{x^c}{x^d} \right)^{a+b} \times \left( \frac{x^d}{x^a} \right)^{b+c} \right]$ (a) 1 (b) -1 (c) 0 (d) 2

13. The compound interest on ₹ 8000 at the rate of 15% per annum for 2 years 4 months when the interest is compounded annually is:

- 14. The length, breadth and height of a cuboid are (5x 7), (2x + 3) and (7x 8) respectively, then the volume of the cuboid is:
  - (a)  $70x^3 73x^2 155x + 168$ (b)  $73x^3 - 70x^2 - 155x + 168$ (c)  $73x^3 - 70x^2 - 155x + 186$ (d)  $70x^3 - 73x^2 - 155x + 186$
- 15. The length of a rectangle is (p + 3) cm and its breadth is (2p 5) cm. If its perimeter is 26 cm, then the area of the rectangle is:
  - (a)  $13 \text{ cm}^2$  (b)  $40 \text{ cm}^2$  (c)  $48 \text{ cm}^2$  (d)  $56 \text{ cm}^2$
- **16.** The salary of an officer has been increased by 50%. By what percent must the new salary be reduced to restore the original salary?
  - (a)  $63\frac{1}{3}\%$  (b)  $53\frac{1}{3}\%$  (c)  $43\frac{1}{3}\%$  (d)  $33\frac{1}{3}\%$
- 17. In a Mess there are 200 men. There is enough food for them for 30 days. If 200 more men arrive at the Mess, for how many days will the food last?
  - (a) 14 days (b) 15 days (c) 16 days (d) 17 days
- **18.** The following pie chart shows the favourite tourist destinations in India:



If 1500 people participated in the survey, how many people voted for Mumbai?

(a) 375 (b) 300 (c) 325 (d) 400



A

- 19. How many sides does a regular polygon have if the measure of an exterior angle is  $20^{\circ}$ ?
  - (a) 12 (b) 13 (c) 18 (d) 16
- **20.** In the given figure ABCD is a rhombus and PBAQ is a square. Find  $\angle ADQ$ .



- (a)  $10^{\circ}$  (b)  $15^{\circ}$  (c)  $20^{\circ}$  (d)  $25^{\circ}$
- **21.** Multiplicative inverse of  $2\frac{3}{11}$  is:

A

- (a)  $-2\frac{3}{11}$  (b)  $2\frac{11}{3}$  (c)  $\frac{25}{6}$  (d) 0.44
- 22. The given figure shows a parallelogram ABCD. M is a point on CD such that AM = BM. If  $\angle DAM = 25^{\circ}$  and  $\angle ADC = 100^{\circ}$ , the measure of  $\angle AMB$  is:



23. In the figure, ABCD is a parallelogram and AB = 6 cm. AB is produced to E. If the area of  $\triangle$ ADE is  $\frac{3}{4}$  that of parallelogram ABCD, then find the length of BE.





Genius 20 / 22 Jan. 2023 / Class 8th moving to Class 9th

- 24. On the Republic Day, sweets were to be distributed among 450 children. But that day 150 children were absent and therefore each child got 3 extra sweets. How many sweets did each child get?
  - (a) 15 (b) 6 (c) 9 (d) 12
- Cards marked with numbers 12, 13, 14, ......21, 22 are placed in a bag and mixed thoroughly. One card 25. is drawn randomly from the bag. Find the probability that the number on the card drawn is not divisible by 3.

(a) 
$$\frac{7}{11}$$
 (b)  $\frac{6}{11}$  (c)  $\frac{7}{10}$  (d)  $\frac{3}{5}$ 

## CHEMISTRY

A

- 26. Which of the following is the oldest synthetic plastic?
  - (a) Polyester (b) Bakelite (c) Melamine (d) Polyethene
- Match column I with column II and choose the correct option from the code given below. 27.

	Column I		Column II
Р	Nylon	(i)	Artificial Silk
Q	Rayon	(ii)	Man-made fibre.
R	Cotton	(iii)	Obtained by chemical treatment of wood pulp.
S	Polyester	(iv)	PET, Terylene
		(v)	Natural Fibre
		(vi)	Prepared from coal, water and air.

- (a) P-(ii); Q-(ii),(iii); R-(v); S-(ii),(iv)
- (b) P-(ii),(vi); Q-(i),(ii),(iii); R-(v); S-(ii),(iv)
- (c) P-(i),(ii); Q-(ii),(iii); R-(v); S-(iv)
- (d) P-(ii),(iv); Q-(i),(ii),(iii); R-(v); S-(ii),(vi)
- 28. When a copper vessel is exposed to moist air for long, it acquires a dull green coating. The green material in the coating is-
  - (a) A mixture of copper carbonate and copper sulphide.
  - (b) A layer of copper carbonate only.
  - (c) A mixture of copper carbonate and copper hydroxide.
  - (d) A mixture of copper oxide and copper hydroxide.





- **29.** Magnesium ribbon burns in air with a white dazzling flame forming a white powder of magnesium oxide, the powder obtained on burning magnesium ribbon, is dissolved in water. After dissolution the following observations were made;
  - 1. Solution obtained turns blue litmus to red.
  - 2. Solution obtained turns red litmus to blue.
  - 3. Solution is acidic in nature.
  - 4. Solution is basic in nature.
  - 5. In general, metallic oxides are basic in nature.

Choose the correct response from the given code below:

(a) 2, 3 and 5 (b) 2, 4 and 5 (c) 1, 3 and 5 (d) 2 and 4

- **30.** Which of the following is called as black gold?
  - (a) Petroleum (b) Coal (c) Coke (d) Coal Tar
- **31.** The rubbing surface of a matchbox contains
  - (a) Antimony trisulphate (b) White Phosphorus
  - (c) Potasium Chlorate (d) Powdered glass
- **32.** The correct increasing order of the calorific values of the fuels are:
  - (a) Diesel < Wood < Coal < CNG (b) LPG < CNG < Petrol < Diesel
  - (c) Coal < Diesel < Methane < LPG (d) Wood < Coal < LPG < CNG
- **33.** Observations are made by analyzing different zones of candle flame.
  - P. The hottest part of the flame has yellow color and is a non luminous zone.
  - Q. The moderately hot part of the flame has blue colour and is a luminous zone.
  - R. The least hot part of the flame has a black colour and is a dark zone.
  - S. The hottest part of the flame has a blue colour and is luminous zone.

Which of the following option is correct?

(a) P, Q and R (b) Q, R and S (c) Q and R (d) R only

## PHYSICS

- **34.** If a rock is brought from the surface of the moon :
  - (a) Its mass will change

- (b) Its weight will change, but not mass
- (c) Both mass and weight will change (d) Its mass and weight will remain the same



	<b>A</b>			genius 20	
35.	The maximum force of	friction when a body is just	t beginning to move is kn	own as the –	
	(a) limiting friction	(b) rolling friction	(c) static friction	(d) none of these	
36.	A ray of light is inciden mirror is –	t on a plane mirror at an ar	ngle of incidence of 30°.	The deviation produced by the	
	(a) 30°	(b) 60°	(c) 90°	(d) 120°	
37.	When two plane mirrors	s are kept at 90°, we get –			
	(a) only one image		(b) two images		
	(c) three images		(d) infinite number of	images	
38.	For an echo to be disting	guishable from sound, the i	minimum time difference	is –	
	(a) 1 sec	(b) 0.1 sec	(c) 0.01 sec	(d) 10 sec	
39.	Action and reaction force	ees act on –			
	(a) the same body	(b) different bodies	(c) the horizontal surface	ace (d) Nothing can be said	
40.	The accelerated motion of a body can occur –				
	(a) due to change in its speed only				
	(b) due to change in direction of motion only				
	(c) due to change in either speed or direction of motion				
	(d) due to constancy of	velocity.			
41.	Read the following state	ements:			
	(i) Electroplating is based on chemical effect of current				
	(ii) Atmospheric pressu	re is measured by Manome	eter		
	Choose the correct optic	on-			
	(a) Only statement (i) is	s correct	(b) Only statement (ii)	is correct	
	(c) Both statements (i) a	nd (ii) are correct	(d) Neither statement	(i) nor statement (ii) is correct	
42.	Read the following state	ements:			
	(i) Speed of light increa	ases as it goes from denser	to rarer medium.		
	(ii) Light bends toward	the normal as it goes from	rarer to denser medium.		
	Choose the correct optic	on-			
	(a) Only statement (i) is	s correct	(b) Only statement (ii)	is correct	
	(c) Both statements (i) a	nd (ii) are correct	(d) Neither statement	(i) nor statement (ii) is correct	



## **BIOLOGY**

**A** 

43. Match Column-I with Column-II.

	Column-I		Column-I
A.	Yellow vein mosaic of lady's finger	i.	Bacteria
В.	Malaria	ii.	Fungi
C.	Rust of wheat	iii.	Protozoa
D.	Typhoid	iv.	Virus

Choose the correct options-

(a) $A \rightarrow iv, B \rightarrow iii, C \rightarrow ii, D \rightarrow i$	(b) $A \rightarrow i, B \rightarrow ii, C \rightarrow iv, D \rightarrow iii$
(c) $A \rightarrow iv, B \rightarrow ii, C \rightarrow iii, D \rightarrow i$	(d) $A \rightarrow i, B \rightarrow ii, C \rightarrow iii, D \rightarrow iv$

44. Read the following statements and identify P, Q, R and S:

Statement (1): I am present in a hen's egg and I solidify on boiling. I am found just below the shell. I am (P).

**Statement (2) :** I am present in human blood, I am single celled and I can change my shape. I am (Q).

**Statement (3) :** 1-2 drops of mine is used in preparation of temporary mount of human cheek cell. I am (R).

**Statement (4) :** I am the entire content of a living cell. I include cytoplasm and the nucleus. I am (S).

	Р	Q	R	S
(a)	Yolk	White blood cell	Methylene blue	Protoplasm
(b)	Albumin	White blood cell	Methylene blue	Cell organelle
(c)	Albumin	White blood cell	Methylene blue	Protoplasm
(d)	Albumin	Red blood cell	Methylene blue	Protoplasm

- 45. Which option is correct regarding chromosomes?
  - (1) Thread-like structure
  - (2) It carries gene
  - (3) Can be seen only when cell divides
  - (4) Generally present in nucleolus
  - (5) It helps in inheritance of characters from parents to the offspring
  - (a) 1, 2, 3 and 5 are correct but 4 is incorrect (b) 1, 2, 4 and 5 are correct but 3 is incorrect
  - (c) 1, 3, 4 and 5 are correct but 2 is incorrect (d) 2, 3, 4 and 5 are correct but 1 is incorrect
- **46.** In sexually reproducing organisms, the new individual begins its life from a –
  - (a) sperm (b) ova (c) zygote (d) Both (a) and (b)



47. Analyze the given flow chart and choose the correct option –



**[A**]

- (a) i Boy, ii Girl, iii Girl, iv Boy
- (b) i-Girl, ii-Boy, iii-Girl, iv-Boy
- (c) i Boy, ii Girl, iii Boy, iv Girl
- (d) i Girl, ii Boy, iii Boy, iv Girl
- 48. Which option shows correct pathway for excretion of urine in the excretory system?
  - (a) Kidney  $\rightarrow$  Urethra  $\rightarrow$  Ureter  $\rightarrow$  Urinary bladder
  - (b) Kidney  $\rightarrow$  Ureter  $\rightarrow$  Urethra  $\rightarrow$  Urinary bladder
  - (c) Kidney  $\rightarrow$  Ureter  $\rightarrow$  Urinary bladder  $\rightarrow$  Urethra
  - (d) Kidney  $\rightarrow$  Urinary bladder  $\rightarrow$  Urethra  $\rightarrow$  Ureter
- **49.** Match Column-I with Column-II.

	Column-I		Column-I
A.	Ripened ovary develops into	i.	Seeds
B.	Ovules develop into	ii.	Endosperm
C.	Zygote develops into	iii.	Embryo
		iv.	Fruits
		v.	Plants

Choose the correct option-

- (a)  $A \rightarrow iv, B \rightarrow i, C \rightarrow iii$ (b)  $A \rightarrow i, B \rightarrow ii, C \rightarrow iii$ (c)  $A \rightarrow i, B \rightarrow ii, C \rightarrow v$ (d)  $A \rightarrow iii, B \rightarrow iv, C \rightarrow v$
- **50.** We know one breath means one inhalation and one exhalation. During breathing we observe some changes in the thoracic cavity, these are
  - (1) Diaphragm moves down wards (2) Ribs move outwards
  - (3) Diaphragm moves upwards (4) Ribs move inwards
  - Choose the correct option-
  - (a) 1, 2 denote inhalation and 3, 4 denote exhalation.
  - (b) 1, 4 denote inhalation and 2, 3 denote exhalation.
  - (c) 1, 2 denote exhalation and 3, 4 denote inhalation.
  - (d) 1, 4 denote exhalation and 2, 3 denote inhalation.

\* \* \* \* \*



# genius 20 💻

## **DETAIL SOLUTION OF SET -A**

## MATHEMATICS

**1.** (b)

As per given condition,

$$\frac{4}{5} \times \frac{1}{8} \times \frac{3}{4} \times x = 64$$
  

$$\Rightarrow x = \frac{64 \times 5 \times 8}{3}$$
  
Now cube root of  $\left(\frac{3}{5}\right)^{\text{th}}$  of x  

$$\therefore \sqrt[3]{\frac{3}{5} \times x}$$
  

$$= \sqrt[3]{\frac{3}{5} \times \frac{64 \times 5 \times 8}{3}}$$
  

$$= \sqrt[3]{(4 \times 4 \times 4) \times (2 \times 2 \times 2)}$$
  

$$= 4 \times 2$$
  

$$= 8$$

**2.** (a)

L.C.M. of (2, 4, 6) = 12

least perfect square which is a multiple of 12 is 36.

**3.** (c)

$$=\frac{\frac{2}{9}\left(\frac{5}{3}-\frac{3}{8}\times\frac{13}{9}\right)+\frac{4}{17}}{\frac{3}{4}\times\frac{11}{7}\div\frac{3}{2}-\frac{11}{28}}\times\frac{\left(\frac{9+8}{12}\right)}{\left(\frac{9-8}{12}\right)}$$
$$=\frac{\frac{2}{9}\left(\frac{5}{3}-\frac{13}{24}\right)+\frac{4}{17}}{\frac{3}{4}\times\frac{11}{7}\times\frac{2}{3}-\frac{11}{28}}\times\frac{17}{(1)}$$



$$=\frac{\frac{2}{9}\left(\frac{40-13}{24}\right)+\frac{4}{17}}{\frac{22}{28}-\frac{11}{28}} \times 17$$
$$=\frac{\frac{2}{9}\left(\frac{27}{24}\right)+\frac{4}{17}}{\left(\frac{11}{28}\right)} \times 17$$
$$=\frac{\left(\frac{1}{4}+\frac{4}{17}\right)}{\left(\frac{11}{28}\right)} \times 17$$
$$=\left(\frac{17+16}{68}\right) \times \left(\frac{28}{11}\right) \times 17$$
$$=\frac{33}{68} \times \frac{28}{11} \times 17$$
$$=21$$

**4.** (d)

A

Given: 
$$(504 + p)^{\frac{1}{3}} = p$$
  
 $\Rightarrow 504 + p = p^3$   
 $\Rightarrow p^3 - p = 504$   
 $\Rightarrow p(p^3 - 1) = 504$   
 $\Rightarrow p(p - 1)(p + 1) = 504$   
 $\Rightarrow (p - 1) p(p + 1) = 7 \times 8 \times 9$   
 $\Rightarrow p = 8$ 

$$x + \frac{1}{x} = 5$$

Squaring both sides,

$$\left(x+\frac{1}{x}\right)^2 = \left(5\right)^2$$





$$x^{2} + 2 + \frac{1}{x^{2}} = 25$$
$$\Rightarrow x^{2} + \frac{1}{x^{2}} = 23$$

Again squaring both sides,

$$\left(x^{2} + \frac{1}{x^{2}}\right)^{2} = (23)^{2}$$
$$\Rightarrow x^{4} + 2 + \frac{1}{x^{4}} = 529$$
$$\therefore x^{4} + \frac{1}{x^{4}} = 527$$

#### 6. (d)

Let the two numbers be x and y, where x is greater than y

According to the question:

$$x^2 - y^2 = 275$$
 and  $\sqrt{y} = 5$   
 $\therefore y = 25$  (smaller number)  
and  $x^2 = 275 + y^2$ 

an

$$x^{2} = 275 + 625$$
  
 $x^{2} = 900$   
 $x = 30$ 

Hence, the larger number is 30 and its cube is 27000.

#### 7. (a)

Let the number of coins be N

$$N = \frac{\text{Volume of cylinder}}{\text{Volume of a coin}}$$

$$=\frac{\pi \left(\frac{4.5}{2}\right)^2 \times 10}{\pi \left(\frac{1.5}{2}\right)^2 \times 0.2}$$





$$= \frac{4.5 \times 4.5 \times 10}{1.5 \times 1.5 \times 0.2} \times \frac{1000}{1000}$$
$$= \frac{45 \times 45 \times 100}{15 \times 15 \times 2}$$
$$= 9 \times 50$$
$$= 450$$

**8.** (b)

Let p be the principal and r be the rate of interest

Given: 
$$2p = p \left(1 + \frac{r}{100}\right)^4$$
  
 $\Rightarrow \left(1 + \frac{r}{100}\right)^4 = 2$   
 $\Rightarrow \left(1 + \frac{r}{100}\right) = 2^{\frac{1}{4}}$  ...(i)

Let in t years, the amount will be eight times itself

$$\Rightarrow 8p = p\left(1 + \frac{r}{100}\right)^{t}$$

$$\Rightarrow \left(1 + \frac{r}{100}\right)^{t} = 8$$

$$\Rightarrow \left(2^{\frac{1}{4}}\right)^{t} = 8 \qquad \text{(from equation (i))}$$

$$\Rightarrow 2^{\frac{1}{4}} = 2^{3}$$

$$\Rightarrow \frac{t}{4} = 3$$

$$\Rightarrow t = 12 \text{ years}$$
Hence required time is 12 years.

**9.** (a)

(S.P. of 33 m) - (C.P. of 33 m) = Gain

 $\Rightarrow$  (S.P. of 33 m) – (C.P. of 33 m) = S.P. of 11 m



genius 20 💻

⇒ S.P. of 22 m = C.P. of 33 m Let C.P. of each metre be ₹ 1 ∴ C.P. of 22 m = ₹ 22 S.P. of 22 m = ₹ 33 ∴ Gain = ₹ (33 – 22) = 11

...(i)

(from eqation (i))

:. Gain % = 
$$\frac{11}{22} \times 100 = 50\%$$

#### **10.** (d)

$$= a^{2} - 2ab - c^{2} + b^{2}$$
$$= a^{2} - 2ab + b^{2} - c^{2}$$
$$= (a - b)^{2} - c^{2}$$
$$= (a - b + c) (a - b - c)$$

#### **11.** (b)

Let  $\boldsymbol{\ell}$  be the length and b be the breadth of rectangle.

Area of a rectangle = 
$$x^4 + x^2 + 1$$
  

$$\Rightarrow \ell b = x^4 + x^2 + 1$$

$$\Rightarrow \ell b = (x^2)^2 + 2x^2 + 1 - x^2$$

$$\Rightarrow \ell b = (x^2 + 1)^2 - (x)^2$$

$$\Rightarrow \ell b = (x^2 + 1 + x)(x^2 + 1 - x)$$

$$\Rightarrow \ell b = (x^2 + x + 1)(x^2 - x + 1)$$
perimeter =  $2(\ell + b)$ 

$$= 2(x^2 + x + 1 + x^2 - x + 1)$$

$$= 2(2x^2 + 2)$$

$$= 4(x^2 + 1)$$

**12.** (c)



```
\begin{aligned} &\frac{x^{4a+4b+4c}}{x^{4a+4b+4c}} - x^{(a-b)(c+d)} \cdot x^{(b-c)(d+a)} \cdot x^{(c-d)(a+b)} \cdot x^{(d-a)(b+c)} \\ &= 1 - x^{ac+ad-bc-bd+bd+ab-dc-ac+ac+bc-ad-bd+bd+cd-ab-ac} \\ &= 1 - x^{0} \\ &= 1 - 1 \\ &= 0 \end{aligned}
```

**13.** (b)

A

Here, Principal = ₹ 8000

Rate of interest = 15% p.a.

and n = 2 years 4 months

$$= 2\frac{4}{12} \text{ years}$$
$$= 2\frac{1}{3} \text{ years}$$

Amount after 2 years and 4 months

$$A = p \left( 1 + \frac{R}{100} \right)^2 \left[ 1 + \frac{R}{3} \right]$$
  
= 8000  $\left( 1 + \frac{15}{100} \right)^2 \left( 1 + \frac{15}{3(100)} \right)^2$   
= 8000  $\left( 1 + \frac{3}{20} \right)^2 \left( 1 + \frac{1}{20} \right)^2$   
= 8000  $\left( \frac{23}{20} \right)^2 \left( \frac{21}{20} \right)^2$   
= 8000  $\left( \frac{23}{20} \right)^2 \times \frac{21}{20}$   
= 8000  $\times \frac{23 \times 23 \times 21}{20 \times 20 \times 20}$   
= 23 × 23 × 21  
= ₹ 11109



 $\therefore$  Compound Interest = Amount – Principal

=₹(11109 - 8000)

=₹3109

#### **14.** (a)

A

- Length  $(\ell) = 5x 7$
- Breadth (b) = 2x + 3
- Height (h) = 7x 8

Volume of cuboid =  $\ell bh$ 

$$= (5x - 7)(2x + 3)(7x - 8)$$
$$= [10x^{2} + 15x - 14x - 21](7x - 8)$$
$$= (10x^{2} + x - 21)(7x - 8)$$
$$= 70x^{3} + 7x^{2} - 147x - 80x^{2} - 8x + 168$$
$$= 70x^{3} - 73x^{2} - 155x + 168$$

Let  $\ell$  be the length and b be the breadth of rectangle

$$\ell = p + 3$$

$$b = 2p - 5$$

Perimeter =  $2(\ell + b)$ 

$$26 = 2(p + 3 + 2p - 5)$$

- $\Rightarrow 26 = 2(3p-2)$
- $\Rightarrow 26 = 6p 4$
- $\Rightarrow 6p = 30$
- $\Rightarrow p = 5$
- $\therefore$  Area of rectangle = (p + 3) (2p 5)

$$= (5+3) (2 \times 5 - 5)$$
$$= (8 (10-5))$$
$$= 8 \times 5$$





$$=40$$
 cm<sup>2</sup>

**16.** (d)

Let original salary be ₹ 100.

Then, increase in the salary = 50% of ₹ 100

$$= \overline{\mathbf{R}} \left( \frac{50}{100} \times 100 \right)$$

=₹50

Salary after increment = ₹ 100 + ₹ 50

Now, in order to restore the original salary, a reduction of  $\gtrless$  50 should be made on  $\gtrless$  150.

Thus, Reduction on ₹ 150 = ₹ 50

⇒ Reduction on ₹ 1 = ₹ 
$$\frac{50}{150}$$

⇒ Reduction on ₹ 100 = ₹ 
$$\left(\frac{100}{3}\right)$$

$$=$$
 ₹ 33 $\frac{1}{3}$ 

$$\therefore \text{ Reduction on new salary} = 33\frac{1}{3}\%.$$

**17.** (b)

Men in the beginning = 200

Men now = 200 + 200 = 400

Let the required time be x days.

Thus, we have

Number of Men	200	400
Number of Days	30	х

This is a case of inverse proportion

So, 
$$200 \times 30 = 400 \times x$$

$$\Rightarrow x = \frac{200 \times 30}{400} = 15 \text{ days}$$

**18.** (a)



## genius 20 =

Percentage for Mumbai = [100 - (12 + 8 + 15 + 8 + 32)]%

= 25 %

 $\therefore$  Number of people voted for Mumbai = 25% of  $1500 = \frac{25}{100} \times 1500 = 375$ 

**19.** (c)

Sum of all exterior angles =  $360^{\circ}$ 

$$\Rightarrow$$
 No. of sides  $\times 20^\circ = 360^\circ$ 

$$\Rightarrow \qquad \text{No. of sides} = \frac{360^\circ}{20^\circ} = 18$$

**20.** (d)



All sides of a rhombus are equal

 $\therefore$  AB = BC = CD = DA ...(i)  $\Rightarrow$  AB = BC  $\angle BAC = \angle BCA = 70^{\circ}$  $\Rightarrow$ BC||AD (opposite sides of a rhombus are parallel) Now,  $\therefore \ \angle DAC = \angle BCA = 70^{\circ}$ (alt. int. angles)  $\angle BAD = BAC + \angle DAC = 70^{\circ} + 70^{\circ} = 140^{\circ}$  $\angle QAB = 90^{\circ}$ (angle of a square) Now,  $\angle QAB + \angle BAD + \angle DAQ = 360^{\circ}$ (complete angle)  $\Rightarrow 90^{\circ} + 140^{\circ} + \angle DAQ = 360^{\circ}$  $\angle DAQ = 130^{\circ}$  $\Rightarrow$ Now, PBAQ is a square  $\therefore$  PB = BA = AQ = QP ...(ii) From (i) and (ii), we have

A

genius 20 💻

...(iii)

 $\angle DAQ + \angle AQD + \angle ADQ = 180^{\circ}$  $\Rightarrow 130^{\circ} + 2\angle ADQ = 180^{\circ}$ (from (iii))  $2\angle ADQ = 50^{\circ}$  $\angle ADQ = 25^{\circ}$  $\Rightarrow$  $\Rightarrow$  $\therefore \angle ADQ = 25^{\circ}$ 21. (d)  $2\frac{3}{11} = \frac{25}{11}$  $\therefore$  Multiplicative inverse of  $2\frac{3}{11}$  is  $\frac{11}{25} = 0.44$ 22. (b)  $\angle ADC + \angle DAB = 180^{\circ}$ (co-int. angles)  $\Rightarrow 100 + \angle DAB = 180^{\circ}$  $\angle DAB = 80^{\circ}$  $\Rightarrow$  $\angle MAB = \angle DAB - \angle DAM$  $= 80^{\circ} - 25^{\circ} = 55^{\circ}$ Now,  $AM = BM \implies \angle MAB = \angle MBA = 55^{\circ}$ In  $\triangle AMB$  $\angle AMB + \angle MAB + \angle MBA = 180^{\circ}$  $\angle AMB + 55^{\circ} + 55^{\circ} = 180^{\circ}$  $\Rightarrow$ 

**23.** (c)

 $\Rightarrow$ 

Draw DM  $\perp$  AB

Area of parallelogram  $ABCD = base \times height = AB \times DM$ 

 $\angle AMB = 70^{\circ}$ 

Area of 
$$\triangle ADE = \frac{1}{2} \times base \times height$$
$$= \frac{1}{2} \times AE \times DM$$

According to question,





genius 20 =

ar (
$$\Delta ADE$$
) =  $\frac{3}{4} \times ar (||^{gm} ABCD)$   
  
⇒  $\frac{1}{2} \times AE \times DM = \frac{3}{4} \times AB \times DM$   
  
⇒  $\frac{AE}{AB} = \frac{3}{4} \times 2 = \frac{3}{2}$   
  
⇒  $\frac{AE}{6} = \frac{3}{2}$  (::  $AB = 6 \text{ cm}$ )  
  
⇒  $AE = 9 \text{ cm}$   
  
∴  $BE = AE - AB = 9 - 6 = 3 \text{ cm}$ 

Let each child got x sweets. Then initially he was to get (x - 3) sweets.

According to question,

450 (x - 3) = (450 - 150)x

 $\Rightarrow 450x - 1350 = 450 x - 150 x$ 

 $\Rightarrow$  150x = 1350

$$\Rightarrow \qquad x = \frac{1350}{150} = 9$$

So, each child got 9 sweets.

**25.** (a)

Possible outcomes: 12, 13, 14, ..... 22

These are total 11 in numbers

Favourable outcomes: 13, 14, 16, 17, 19, 20, 22

These are total 7 in numbers

Probability =  $\frac{\text{no. of favourable outcomes}}{\text{no. of possible outcomes}}$ 

$$=\frac{7}{11}$$

## CHEMISTRY

**26.** (b)

{*Class* 8<sup>th</sup> *NCERT Chapter-3 Synthetic Fibres & Plastics*}

**27.** (b)

#### Explanation:

P- Nylon  $\rightarrow$  It is a man-made fibre, which is prepared from coal, water and air



- +h

- Q- Rayon  $\rightarrow$  It is a man-made fibre also known as Artificial Silk which is obtained by chemical treatment of wood pulp.
- R- Cotton  $\rightarrow$  It is a natural fibre.
- S- Polyester  $\rightarrow$  It is a man-made fibre, PET and Terylene are different forms of polyester.

{*Class* 8<sup>th</sup> *NCERT Chapter-3 Synthetic Fibres & Plastics*}

- **28.** (c)  $\{Class 8^{th} NCERT page no. 47\}$ 
  - 29. (b)
     {Class 8<sup>th</sup> NCERT page no. 47}

     30. (a)
     {Class 8<sup>th</sup> NCERT page no. 60}
  - **31.** (d)

### **Explanation**:

A mixture of antimony trisulphide, potassium chlorate and white phosphorus with some glue starch applied on the head of match and the rubbing surface has powdered glass on it.

		{Class 8 <sup>th</sup> NCERT page no. 67}
32.	(c)	{ <i>Class</i> 8 <sup>th</sup> <i>NCERT</i> page no. 73, <i>Table no.</i> 6.4}
33.	(d)	{ <i>Class</i> 8 <sup>th</sup> <i>NCERT</i> page no. 72, Figure no. 6.13}

## PHYSICS

34. (b) Mass is the amount of matter contained in a body, so it does not depend on gravity and is a constant, but weight, w = mg

So, weight will change, but not mass.

- **35.** (a) Maximum value of static friction is called limiting friction. If a body is applied a force greater than the limiting friction, the body starts to move.
- **36.** (d)



deviation produced by mirror

$$= \theta$$
$$= 180^{\circ} - 60^{\circ}$$
$$= 120^{\circ}$$

**37.** (c) Image produced by two mirrors,

$$=\frac{360}{\theta}-1$$



## genius 20 =



$$=\frac{360}{90}-1$$

= 4 - 1 = 3

**38.** (b) Minimum time difference between two sound to be distinguishable is 0.1 s.

**39.** (b)



action and reaction always act on the different bodies

- **40.** (c) Acceleration is rate of change of velocity and velocity can be changed either by changing speed or direction. So, acceleration can occur due to change in both speed and direction.
- **41.** (a) Electroplating uses chemical effect of current and transfers metal from anode to cathode. Barometer is used to measure atmosphere pressure.

Only statement (i) is correct

42. (c) 
$$V_{\text{medium}} = \frac{c}{u}$$

as  $\mu$  increases,  $v_{\text{medium}}$  decreases.

So, speed of light in rarer medium is more than that in denser medium.

 $\frac{\sin i}{\sin r} = \frac{\mu_2}{\mu_1}$ 

as we go from rarer to denser,  $\frac{\mu_2}{\mu_1} > 1$ 

 $\frac{\sin i}{\sin r} > 1$ sin i > sin r r < i light bends towards the normal.

## BIOLOGY

- **43.** (a) (*Class-8<sup>th</sup> NCERT, Page no. 24, 25*)
- 44. (c) Statement (1) : (Class-8<sup>th</sup> NCERT, Page no. 93) Statement (2) : (Class-8<sup>th</sup> NCERT, Page no. 92) Statement (3) : (Class-8<sup>th</sup> NCERT, Page no. 94) Statement (4) : (Class-8<sup>th</sup> NCERT, Page no. 95)
- **45.** (a) (*Class-8<sup>th</sup> NCERT*, *Page no. 95*)
- **46.** (c) (*Class-8<sup>th</sup> NCERT*, *Page no. 104, 119*)
- **47.** (d) (*Class-8<sup>th</sup> NCERT*, *Page no. 119*)







- **48.** (c) (*Class-7<sup>th</sup> NCERT, Page no. 126, 127*)
- **49.** (a) (*Class-7<sup>th</sup> NCERT, Page no. 138*)
- **50.** (a) (*Class-7<sup>th</sup> NCERT*, *Page no. 113*)

\* \* \* \* \*

