SCI

GSC

(1) complex

(3) connected

(2) colorful

(4) complete

17. (1) frequented

(3) comprehensive

(2) extended

(4) prevalent

George School Competitive Exams 18. (1) saturate (2) pervade Three of the following four letter-clusters are alike in a (3) invade (4) persuade certain way and one is different. Pick the odd one out. **Direction**: Identify the segment in the sentence, which (1) BEHK (2) WYAC contains the grammatical error. (3) IJKL (4) PRTU 19. "Unless you did not do your homework you will be Raman remembers that the examination is after 15th May punished," said the teacher. but before 18th May, while Deep remembers that the (1) do your homework (2) Unless you did not examination is before 21st May but after 16th May. On (3) said the teacher. (4) you will be punished which date of May is the examination? **Direction**: Given below are four jumbled sentences. (1) 17Select the option that gives their correct order. (3) 19(4) 2020 A. So, I had thoughts of setting up an Indian restaurant From the given answer figures, select the one in which the there with my wife's support. question figure is hidden/embedded. B. It took us two months to redesign the place to suit C. One of the things I really missed when I set up home in Maryland, was a restaurant that served authentic Indian food. D. I decided to pursue this idea seriously and bought an old building in the downtown. (1) CBAD (2) BCDA (3) CADB (4) DACB **Direction:** Select the word which means the same as the group of words given. (1)(1)(1)21. Incapable of being corrected (2) incredible (1) incorrigible In the following question, select the missing number (3) inviolable (4) impossible from the given alternatives. Direction: Select the word which means the same as 5 8 32 the group of words given. 9 6 48 22. One who walks in sleep 7 9 ? (1) pedestrian (2) philanthropist

(1) 45	(2) 48	(3) 54	(4) 64
` '	` /	` '	` /

- Select the odd word pair from the given alternatives.
 - (1) Diesel-Bus
- (2) Oil-Earthen lamp
- (3) Smoke-Fire
- (4) Petrol-Car
- If 6 @ 4 @ 7 = 101 and 2 @ 5 @ 11 = 150, then what is the value of A in A @ 8 @ 9 = 289?
- (2) 8
- (3) 12
- In the following question, select the related number from the given alternatives.

AKP: 1121256:: LNO:?

- (1) 196125144
- (2) 144196225
- (3) 144225196
- (4) 41521196

- 25. I am very much pleased to see you here today.
- 10. In the question below is given some statements followed by some conclusions. Taking the given statements to be true even if they seem to be at variance from commonly known facts, read all the conclusions and then decide which of the given conclusion logically follows the given statements.

General Intelligence

Find the missing number. 88, 22, 25, 5, 9, 3/2, ?

(1) very pleased

(3) very pleasing

(3) omnipotent

given word.

(1) sensitive

(1) the class

(3) completed the test

(3) sentimental

contains the grammatical error.

improvement select "No improvement"

23. ABSURD

test.

GSCI

(1) 10/2

(2) 13/2

(4) somnambulist

(2) when you have

(2) No improvement

(4) too much pleased

(4) You may left

(2) selfish

(4) sensible

Direction: Select the most appropriate antonym of the

Direction: In the sentence identify the segment which

Direction: Select the alternative that will improve the underlined part of the sentence in case there is no

24. You may left the class when you have completed the

(3)6

(4) 12

In a certain code language, "BALL" is written as "27" and "CANE" is written as "23". How is "YELL" written in

that code language?

(2)39

(1)50

(3)54

(4)61

Statements:

I. All pens are pencils.

II. No pencil is eraser.

III. Some cups are erasers.

Conclusions:

I. Some cups are not pencils.

II. Some cups are not pens.

III. Some pencils are not cups.

IV. No pen is eraser.



George School of Competitive Exams

-)
- (1) Only conclusion (I), (II) and (III) follow
- (2) Only conclusion (II) and (IV) follow
- (3) Only conclusion (I), (II) and (IV) follow
- (4) All conclusions follow
- 11. Select the related word from the given alternatives.

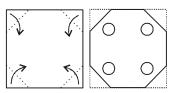
The Time Machine: H. G. Wells : : Julius Caesar : ?

- (1) Rabindra Nath Tagore
- (2) William Shakespeare
- (3) Charles Dickens
- (4) Leo Tolstoy

30**E**

- 12. Pointing to a photograph a woman says, "He is the brother of the daughter of my mother-in-law's only son". How is the man related to the woman?
 - (1) Son
- (2) Brother
- (3) Brother-in-law
- (4) Nephew
- 13. If '-' means '+', '+' means '-', 'x' means '÷' and '÷' means 'x' then which of the following will be the correct equation?
 - (1) $10 + 5 14 \div 10 \times 15 = 158$
 - (2) $30 + 5 + 14 10 \times 15 = 122$
 - (3) $30 5 + 14 \div 10 \times 15 = 162$
 - $(4) \ 30 \times 5 4 \div 10 + 15 = 31$

14. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.





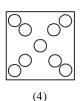


(1)

GSCE

(2)

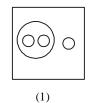


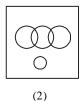


(3)

15. Identify the diagram that best represents the relationship among the given classes.

Olympic games, Tennis, Wrestling, Ludo





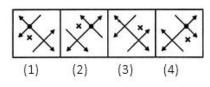




(3)

- (4)
- 16. Arrange the following words as per order in the dictionary:
 - (i) Noble
 - (ii) Nobilitary
 - (iii) Noblesse
 - (iv) Nobility
 - (v) Nobble
 - (1) (i), (iv), (iii), (ii), (v) (2) (iii), (iv), (i), (ii), (v)
 - (3) (v), (ii), (iv), (i), (iii) (4) (ii), (iv), (iii), (v), (i)
- 17. If in December month on 17th day is Monday. What day will be maximum times in the month?
 - (1) Monday
- (2) Tuesday
- (3) Wednesday
- (4) Friday
- 18. In the following question, which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?
 - a _ c a a b _ a _ b c a a b _ a _ b _ a
 - (1) cbacba
- (2) bcacac
- (3) acbaca
- (4) bbacaa
- 19. Choose the correct mirror image of the given figure (X) from amongst the four alternatives, when the mirror is in right of (X).





- 20. A travels 12 km towards north and then takes a left turn and covers another 5 km. From there, he turns 180° anticlockwise and travels 10 km further. What is the minimum distance between his initial and final position?
 - (1) 8 km
- (2) 13 km
- (3) 6 km
- (4) 12 km
- 21. In this question, choose one word which can be formed from the letters of the given word.

IMMEDIATELY

- (1) DIALECT
- (2) LIMITED
- (3) DIAMETER
- (4) DICTATE
- 22. In the following question, a word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in the two given matrices. The columns and rows of Matrix I are numbered from 0 to 4 and those of Matrix II from 5 to 9. A letter from these matrices can be represented first by its row and then the column number. You have to identify the correct set for the word given in the question.

П

Matrix I

3

D

0 | 1 | 2 |

0 D O B A

1 O B A I

2 B A I D O

3 | A | I | D | O | B

4 I D O B A

(1) 11, 68, 42, 69

(3) 34, 68, 10, 88

BROWN

BLUE

from the given statements.

the similar pace.

jobs is very high.

(3) Neither I nor II follow

(4) Only conclusion I follows

(1) Only conclusion II follows

(2) Conclusion I and II both follow

workforce.

Conclusions:

(2) Blue

BLOW

colour?

GRAY

(1) Gray

Statements:

Matrix II

W

M R

W

Ν R

(4) Red

L

N

6 7 8 9

R M L W

M L

W N

(2) 21, 95, 33, 97

(4) 34, 86, 44, 78

5

W N

8 | M | L

6 N

7 R

9 L

23. Each face of the dice is painted with Red, Green, Gray,

Blue, Brown and Orange as shown in the given figure.

What colour is painted on the face opposite to Orange

BLUE

RED

24. In the following question, two statements are given

followed by two conclusions I and II. You have to

consider the statements to be true even if they seem to

be at variance from commonly known facts. You have

to decide which of the given conclusions, if any, follows

(1) India's GDP continues to grow at one of the

(2) Every year over 20 million young Indians join the

(I) Population increase is more than the job creation

(II) Supply basket is less and the demand basket for

25. Amit, Bharati, Cheryl, Deepak and Eric are five friends

1. The person wearing a red cap is eatting pastries.

2. Amit does not eat ice-cream and Cheryl is eating

3. Bharati is wearing a yellow cap and Amit wearing a

sandwiches, ice-cream, pastries and pizza.

The person wearing green cap is eating-

reasonable rates but job creation is not picking up

GREEN

(3) Green

C

റ

Quantitative Aptitude The greatest number that divide 148, 246 and 623 leaving remainders 4, 6 and 11 is

(1) 16

(2) 13

(3) 14

(4) 12

If the numerator of a fraction is increased by 140% and the denominator is increased by 150% the resultant fraction is 4/15. What is the original fraction?

(1) $\frac{3}{5}$ (2) $\frac{15}{16}$ (3) $\frac{2}{7}$ (4) $\frac{3}{10}$

- 300 grams of sugar solution has 40% sugar in it. How much sugar should be added to make it 50% in the solution?
 - (1) 10gm

(2) 40gm

(3) 60gm

- (4) 80gm
- If 16a + 16b = 48, what is the average of a and b?

(2) 2.5

(3) 1.5

- (4) 5
- 5 mangoes and 4 oranges cost as much as 3 mangoes and 7 oranges. The ratio of the cost of one mango to that of one orange is
 - (1) 4 : 3
- (2) 1 : 3
- $(3) \ 3 : 2$
- (4) 5:2
- A dishonest shopkeeper professes to sell potatoes at the cost price, but he weighs 950 gm, instead of one kg. What is the percentage of profit?
 - (1) 50
- (2) 5
- (3) 6.5
- (4) 5.26
- The difference between a discount of 35% and two successive discount of 20% on a certain bill was `22. Find the amount of the bill.
 - (1) 200
- (2) `1100
- $(3)^2200$
- (4) Data inadequate
- How long will it take a sum of money invested at 5% p.a. S.I. to increase its value by 40%?
 - (1) 5 years
- (2) 6 years
- (3) 7 years
- (4) 8 years
- A train 125 m long passes a man, running at 5 kmph in the same direction in which the train is going in 10 seconds. The speed of the train is
 - (1) 45 km/hour
- (2) 50 km/hour
- (3) 54 km/hour
- (4) 55 km/hour

- sitting in a restaurant. They are wearing caps of five different colours— yellow, blue, green, white and red. Also, they are eating five different snacks— burgers,
 - 10. To finish a certain job X takes twice as long as Y and Z together and Z three times as long as X and Y together. If X, Y and Z working together complete the job in 6 days, how long would X take to complete the work alone?
 - (1) 16 days
- (2) 18 days
- (3) 24 days
- (4) 28 days

- 4. Eric is eating pizza and is not wearing a green cap.
- 11. Find the value of $\frac{2^n \times 6^{m+1} \times 10^{m-n} \times 15^{m+n-2}}{4^m \times 3^{2m+n} \times 25^{m-1}}$

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

GSCE

GSCE GSCE

GSCE

• GSCE

- (1) Burger
- (2) Sandwiches
- (3) Pastries

sandwiches.

blue cap.

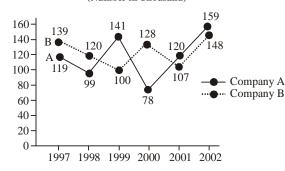
(4) Ice-cream

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- 12. Find the value of $(a + 1)(1 a)(1 a + a^2)(1 + a + a^2)(1$ $+ a^{6}$)
 - (1) $1 a^{12}$ $(2) 1 + a^{12}$
 - $(3) 1 a^{36}$
- $(4) 1 + a^{36}$
- 13. If $x^2 = y + z$, $y^2 = z + x$, $z^2 = x + y$, then the value

 - (1) 1
- (2) -1
- (3) 2
- (4) 4
- **Directions (14-19) :** Study the following Line-Graph and answer the questions based on it.

Number of Vehicle manufactured by Two Companies over the year (Number in Thousand)



- 14. What is the difference between the total production of the two companies in the given years?
 - (1) 20000

GSCE

- (2) 18000
- (3) 28000
- (4) 26000
- 15. What is the difference between the number of vehicles manufactured by company B in 2000 and 2001?
 - (1) 33000
- (2) 13000
- (3) 50000
- (4) 21000
- 16. What is the average number of vehicles manufactured by company A over the given period? (rounded off to the nearest integer) Ü
 - (1) 112778
- (2) 119333
- (3) 111425
- (4) 114533
- 17. In which of the following years, the difference between the production of companies among A and B was the maximum among the given years?
 - (1) 1997
- (2) 1998
- (3) 1999
- (4) 2000
- 18. The value of cot7°. cot 23°.cot 30°.cot 67°. cot 83° equals to
 - (1) $\sqrt{3}$

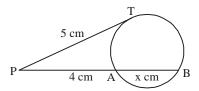
(3) 1

- (4) 0
- = 2, then value of θ is $\cos ec\theta - 1$ $\cos ec\theta + 1$
 - $(1) 60^{\circ}$
- $(2) 0^{\circ}$
- $(3) 30^{\circ}$
- $(4) 45^{\circ}$

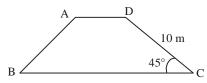
- 20. At a point on level ground, the angle of elevation of a vertical tower is found to be such that its tangent is $\frac{1}{12}$. On walking 192 metres towards the tower, the tangent of the angle of elevation is $\frac{3}{4}$. The height of the tower
 - (1) 160 m
- (2) 180 m
- (3) 170 m
- (4) 190 m
- 21. If three metallic spheres of radii 6 cm, 8 cm and 10 cm are melted to form a single sphere, the diameter of the new sphere will be
 - (1) 30 cm
- (2) 24 cm
- (3) 28 cm
- (4) 32 cm
- 22. A copper sphere of radius 3 cm is beaten and drawn into a wire of diameter 0.2 cm. The length of the wire is
 - (1) 9 m
- (2) 12 m
- (3) 16 m
- (4) 36 m

S

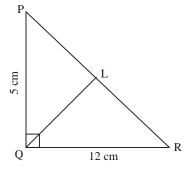
23. In the given figure, PAB is a secant and PT is a tangent to the circle from P. If PT = 5 cm, PA = 4 cm and AB = x cm, then x is equal to



- (1) 2.5 cm
- (2) 2.6 cm
- (3) 2.25 cm
- (4) 2.75 cm
- 24. If ABCD is a trapezium in which AD || BC and AB = DC = 10 m, then the distance of AD from BC



- (1) $10\sqrt{2}$ m (2) $4\sqrt{2}$ m (3) $5\sqrt{2}$ m (4) $6\sqrt{2}$ m
- 25. In the figure given below, $\angle PQR = 90^{\circ}$ and QL is a median, PQ = 5 cm and QR = 12 cm. Then, QL is equal to



(1) 5 cm

5

- (2) 5.5 cm (3) 6 cm
- (4) 6.5 cm

George School Competitive Exams **General Awareness** 13. Carbon monoxide is harmful to human beings as it is (1) carcinogenic Confucius Peace Prize is a prize established in 2010. It (2) antagonistic to CO₂ is given by which of the following countries? (3) with higher affinity for haemoglobin as compared (1) Sri Lanka to oxygen (2) India (3) People's Republic of China (4) destructive to O_3 (4) South Korea 14. Who of the Guptan Emperor had to subdue his rival The technique used to transmit audio signals in television Kacha to ascend the throne? broadcasts is-(1) Samudragupta (2) Chandragupta II (1) amplitude modulation (3) Budhagupta (4) Kumargupta I (2) frequency modulation 15. Butter is a colloid formed when (3) pulse code modulation (1) fat is dispersed in water (4) time division multiplexing (2) fat globules are dispersed in water The permanent wind that blows from the horse latitude (3) water is dispersed in fat to the equatorial region is known as-(4) suspension of casein in water (1) westerly (2) trade wind 16. Which of the following deals with microeconomies (3) doldrum (4) easterly analysis? Lateral meristem is responsible for (1) General price level (2) General supply (1) growth in length (3) Market demand (4) Consumer demand (2) growth of parenchyma 17. Which organization has partnered with the ISRO to (3) growth in thickness undertake joint research activities? (4) growth in cortex (1) NASA The decision to conduct Panchayat Elections is taken by which of the following? (2) Indian Institute of Science (1) The Central Government (3) Harvard University (2) The State Government (4) Indian Institute of Space Science and Technology (3) The District Judge 18. Who was the President of India at the time of (4) The Election Commission proclamation of emergency in the year 1975? The Book 'Vaipulyasutra' deals with which branch of (1) V V Giri (2) Giani Zail Singh Buddhism? (3) Fakhruddin Ali Ahmed (4) Shankar Dayal Sharma (1) Hinayana (2) Mahayan 19. Neutrophils and lymphocytes originate from (4) Jantrism (3) Vajrayana (1) kidney tubule (2) spleen Which one of the following laws stated that the size of (3) bone marrow (4) lymph node a firm and its growth rate are independent? 20. Mahatma Gandhi's close English compatriot during the (1) Gibrat's law (2) Goodhart's law freedom movement was-

- (3) Hubbert's law (4) None of the above Acetylene is used as an anaesthetic under the name of (1) narcylene (2) pyrene
- (3) neopyrene (4) pyroline The expression of earliest volcanic activity in India is
- found in (1) Dalma Hill
 - (2) North Western Deccan Plateau (3) Buldana district of Maharashtra

(1) Suresh Sen

- (4) Deccan trap
- 10. Who has won the 3000m steeplechase in the Federation Cup National Athletics Championship?

(2) Avinash Sable

- (3) Vijay Yadav (4) Dutee Chand 11. In nuclear reactor, cadmium rods are used to (1) absorb neutorns (2) produce neutrons (3) slow down neutrons (4) speed up neutrons
 - 12. A member of Public Service Commission can be removed from his/her office under which Article of the Constitution?
 - (2) Article 316
 - (1) Article 315 (4) Article 318 (3) Article 317
- (1) Thomas Moore (2) AO Hume (3) Charlie Freer (CF) Andrews (4) William Wavell 21. The 'Maharaja Chhatrasal Convention Centre' has recently been inaugurated in which of these UNESCO World Heritage locations? (1)Konark (2)Hampi (3)Sanchi (4)Khajuraho 22. What is the rank of India in the International Intellectual Property Index 2021 released by the US Chamber of Commerce Global Innovation Policy Centre? (1) 40(2)28(3)35(4) 5123. Who is the author of the book 'Conquest of Self'? (1) Aurobindo Ghosh (2) Rabindranath Tagore (3) Mahatma Gandhi (4) S Radhakrishnan 24. 'Jaubani' is a dance form traditionally performed in North Eastern India by the-(1) Dimasas (2) Mizos (3) Khasis (4) Bodos 25. Which of the following ranges is located between Yarkand and Shyok rivers? (1) Ladakh (2) Karakoram (4) Mahabharat (3) Zanskar

Answers with Explanation

English

1. (3)	2. (2)	3. (4)	4. (4)	5. (1)	6. (1)
7. (1)	8. (2)	9. (3)	10. (3)	11. (1)	12. (3)

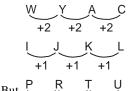
19. (2) Unless itself has a negative meaning, so it's not used in a negative sentence.

- 21. (1) 22. (4) 23. (4)
- 24. (4) Use 'You may leave' in place of 'you may left' to make the sentence grammatically correct.
- 25. (3)

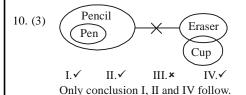
General Intelligence

2. (3) BALL \Rightarrow B + A + L + L = 2 + 1 + 12 + 12 = 27 CANE \Rightarrow C + A + N + E = 3 + 1 + 14 + 5 = 23

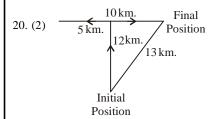
$$YELL \Rightarrow Y + E + L + L = 25 + 5 + 12 + 12 = 54$$



- 4. (1)
- 5. (1)
- 6. (3) Row (1): $(5-1) \times 8 = 32$ Row (2): $(9-1) \times 6 = 48$ Row $(3): (7-1) \times 9 = 54$
- 7. (3) $6^2 + 4^2 + 7^2 = 101$ 8. (3) $2^2 + 5^2 + 11^2 = 150$ Similarly,
 - $A^2 = 289 64 81 = 144$ $\therefore A = 12$
 - A K P 9. (2) \downarrow $1^2 \ 11^2 \ 16^2 = 1121256$
 - Similarly,



- 11. (2)
- 12. (1)
- 13. (4) $30 \times 5 4 \div 10 + 15$ Putting proper signs we get, $30 \div 5 + 4 \times 10 - 15$ = 6 + 40 - 15=46-15=31
- 14. (2)
- 15. (1)
- 16. (3)
- 17. (1)
- 18. (2) a<u>b</u>ca/ab<u>c</u>a/<u>a</u>bca/ab<u>c</u>a/<u>a</u>b<u>c</u>a
- 19. (2)



- 21. (2) 22. (1) 23. (2) 24. (2)
- 25. (2)

Person	Cap	Snacks
Amit	Blue	Burger
Bharati	Yellow	Ice cream
Cheryl	Green	Sandwiches
Deepak	Red	Pastries
Eric	White	Pizza

Quantitative Aptitude

1. (4) requried number = H.C.F. of (148 - 4), (246 - 6)(623 - 11) = H.C.F. of 144, 240 and 612 = 12



George School of Competitive Exams

GSC

2. (3) The original fraction
$$= \frac{\frac{4}{140} \times 100}{\frac{15}{150} \times 100}$$

$$=\frac{4}{140}\times\frac{150}{15}=\frac{2}{7}$$

• GSCE

3. (3) 40% sugar in 300 gm of solution $=\frac{40}{100} \times 300$ = 120 gm

E C

Let x gm sugar may be added Sugar in 100 gms of sugar

solution
$$\Rightarrow \frac{120 + x}{300 + x} \times 100 = 50$$

 \Rightarrow x = 60 gm

田 4. O

4. (3)
$$16a + 16b = 48 \Rightarrow a + b = 3$$

 \therefore Average of a and b $=\frac{a+b}{2}=\frac{3}{2}=1.5$

SCE •

5. (3) Let cost of each mango = x and cost of each orange = y \therefore 5x + 4y = 3x + 7y \Rightarrow 2x = 3y

$$\Rightarrow \frac{x}{y} = \frac{3}{2} = 3:2$$

SCE • G

6. (4) Profit% = $\left(\frac{Error}{true\ value - Error} \times 100\right)$ %

$$=\left(\frac{50}{1000-50}\times100\right)\%$$

$$= \left(\frac{50}{950} \times 100\right) \% = 5.26\%$$

(J

GSCE

7. (3) Let the amount of bill be `x, then

$$\left(1 - \frac{35}{100}\right)x - \left(1 - \frac{20}{100}\right) \times \left(1 - \frac{20}{100}\right)x = 22$$

$$\Rightarrow \frac{65}{100} \times -\left(\frac{80}{100} \times \frac{80}{100}\right) \times = 22$$

$$\Rightarrow 65x - 64x = 2200 \Rightarrow x = 2200$$

8. (4) Let the sum be x

$$A = \left(x + \frac{40}{100}x\right) = \frac{140}{100}x = \frac{7}{5}x$$

$$S.I. = \frac{7x}{5} - x = \frac{2x}{5}$$

$$T = \frac{S.I. \times 100}{P \times R}$$

$$= \frac{\frac{2x}{5} \times 100}{x \times 5} = \frac{2 \times 100}{25} = 8 \text{ years}$$

 \therefore required time = 8 years

9. (2) Let the speed x km/hour. Then relative speed of train with the man

=
$$(x - 5)$$
 km/hour = $(x - 5) \times \frac{5}{18}$ m/second

$$\therefore (x-5) \times \frac{5}{18} = \frac{125}{10}$$

$$\Rightarrow \frac{(x-5)}{18} = \frac{25}{10} \Rightarrow (x-5) = 45$$

 \Rightarrow x = 50 km/hour

10. (2) 2 times X's daily work = (Y + Z)'s daily work \Rightarrow 3 times X's daily work = (X + Y + Z)'s daily

work
$$=\frac{1}{6}$$

X's daily work
$$=\frac{1}{6} \times \frac{1}{3} = \frac{1}{18}$$

.. X alone can finish the work in 18 days

11. (2) Given expression

$$=\frac{2^{n}\times 2^{m+1}\times 3^{m+1}\times 2^{m-n}\times 5^{m-n}\times 3^{m-n-2}\times 5^{m+n-2}}{2^{2m}\times 3^{2m+n}\times 5^{2m-2}}$$

$$=\frac{2^{2m+1}\times 3^{2m+n-1}\times 5^{2m-2}}{2^{2m}\times 3^{2m+n}\times 5^{2m-2}}=\frac{2}{3}$$

12. (1) The given expression

$$= \{(a+1)(1-a+a^2)\}\{(1-a)(1+a+a^2)\}\{1+a^6\}$$

= $(1+a^3)(1-a^3)(1+a^6) = (1-a^6)(1+a^6) = 1-a^{12}$

13. (1) $x^2 = y + z$, $y^2 = z + x$ and $z^2 = x + y$ or, $x + x^2 = x + y + z$, $y + y^2 = x + y + z$ and $z + z^2 = x + y + z$

or,
$$x + x^2 = y + y^2 = z + z^2 = x + y + z = k$$
 (say)

$$\therefore \frac{1}{1+x} = \frac{x}{k}, \frac{1}{1+y} = \frac{y}{k} \text{ and } \frac{1}{1+z} = \frac{z}{k}$$

:. the given expression

$$=\frac{x}{k} + \frac{y}{k} + \frac{z}{k} = \frac{x+y+z}{k} = \frac{k}{k} = 1$$

14. (4) Total production of company A = 119000 + 99000 + 141000 + 78000 + 120000 + 159000 = 716000Total production of Company B = 139000 + 120000 + 100000 + 128000 + 107000 + 148000 = 742000 \therefore required difference = 742000 - 716000 = 26000

. (4) Required difference = 128000 - 107000 = 21000

16. (2) Average number of vehicles manufactured by Company A

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$$119000 + 99000 + 141000$$
$$= \frac{+78000 + 120000 + 159000}{6} = 119333$$

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The difference for year 1997 to 2001 are for 1997 = 139000 - 119000 = 20,000for 1998 = 120000 - 99000 = 21,000for 1999 = 141000 - 100000 = 41,000for 2000 = 128000 - 78000 = 50,000for 2001 = 120000 - 107000 = 13,000for 2002 = 159000 - 148000 = 11,0002000 is the required answer.

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18. (1) $\cot 67^{\circ} = \tan 90^{\circ} - 67^{\circ} = \tan 23^{\circ}$

Similarly cot $83^{\circ} = \tan 7^{\circ} = \frac{1}{\cot 7^{\circ}}$ cot7° cot23° cot30° cot67° cot83° $= \cot 7^{\circ}.\cot 23^{\circ}.\sqrt{3}.\frac{1}{\cot 23^{\circ}}.\frac{1}{\cot 7^{\circ}}$

 $=\sqrt{3}$

19. (4)

 $\frac{\cos\theta}{\cos \sec\theta - 1} + \frac{\cos\theta}{\cos \sec\theta + 1} = 2$

 $\frac{\cos\theta}{\left(\frac{1}{\sin\theta}\right) - 1} + \frac{\cos\theta}{\left(\frac{1}{\sin\theta}\right) + 1} = 2$

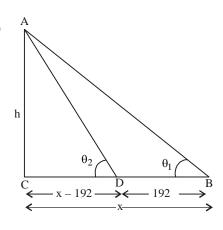
 $\cos \theta . \sin \theta \left(\frac{1 + \sin \theta + 1 - \sin \theta}{1 - \sin^2 \theta} \right) = 2$

 $\frac{2\sin\theta\cos\theta}{\cos^2\theta} = 2 \Rightarrow \tan\theta = 1 \Rightarrow \theta = 45^{\circ}$

20. (2)

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Let h be the height of tower Let BC = x

 $\tan \theta_1 = \frac{5}{12}$ and $\tan \theta_2 = \frac{3}{4}$

 $\therefore \frac{h}{x} = \tan \theta_1 = \frac{5}{12} \Rightarrow \frac{h}{x} = \frac{5}{12} \quad \dots \dots (i)$

 $\frac{h}{x-192} = \tan \theta_2 = \frac{3}{4}$ \Rightarrow 4h = 3(x - 192)(ii)

Putting $h = \frac{5}{12}x$ from (i), in eq. (ii),

 $4 \times \frac{5}{12} x = 3x - 576 \Longrightarrow 4x = 1728$

 $h = \frac{5}{12}x = \frac{5}{12} \times 432 = 5 \times 36 = 180$

21. (2) Total volume of three spheres $=\frac{4}{3}\pi$

 $\left[(6)^3 + (8)^3 + (10)^3 \right]$

 $=\frac{4}{3}\pi(1728)\text{cm}^3$

Let radius of the new sphere be 'r' then

 $\frac{4}{3}\pi r^3 = \frac{4}{3}\pi \times (1728)$

 $r^3 = 1728$

 $r^3 = (12)^3$

r = 12 cm

 \therefore diameter = 2r = 24 cm

22. (4) Volume of sphere = Volume of water

 $\frac{4}{3}\pi(3)^3 = \pi \times (0.1)^2 \times l$

 $l = \frac{4 \times 3 \times 3}{0.1 \times 0.1} = 3600 \text{ cm} = 36 \text{ m}$

23. (3) $PA \times PB = PT^2 \Rightarrow 4 \times (4 + x) = 25$

 $\Rightarrow 4 + x = \frac{25}{4} = 6.25 \Rightarrow x = 2.25 \text{ cm}$

24. (3) Draw a perpendicular DE on BC (distance between AD and BC)



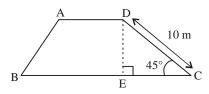
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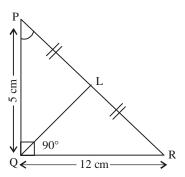
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Now,
$$\sin 45^\circ = \frac{DE}{10} = \frac{1}{\sqrt{2}}$$

$$\Rightarrow DE = \frac{10}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = 5\sqrt{2} \text{ m}$$

Given that, PQ = 5 cm. QR = 12 cm and QL is a



$$\therefore$$
 PL = LR = $\frac{PR}{2}$

In
$$\triangle PQR$$
, $(PR)^2 = (PQ)^2 + (QR)^2$

[by Pythagoras theorem]

$$= (5)^2 + (12)^2$$
$$= 25 + 144 = 169 = (13)^2$$

$$\Rightarrow PR^2 = (13)^2 \Rightarrow PR = 13 \text{ cm}$$

Now, by theorem, if L is the mid-point of the hypotenuse PR of a right angled ΔPQR , then

$$QL = \frac{1}{2}PR = \frac{1}{2}(13) = 6.5 \text{ cm}$$

General Awareness

The Confucius Peace Prize was a Chinese alternative to the Nobel Peace Prize established in 2010 by the Association of Chinese Indigenous Arts in the People's Republic of China (PRC). The prize was created in response to a proposal by businessman Liu Zhiqin that criticized the 2010 Nobel Peace Prize, which was awarded to imprisoned Chinese dissident Liu Xiaobo. It is bestowed for the promotion of world peace from an Eastern perspective and the 21st-century interpretation of Confucianism i.e. universal harmony in the world.

Frequency modulation is a process in which the frequency of the carrier is varied in accordance with the instantaneous value of modulating voltage. In telecommunications and signal processing frequency

modulation (FM) conveys information over a carrier wave by varying its instantaneous frequency. FM is most commonly used for radio and television broadcasting. In Analog TV broadcast, Audio signals are transmitted by Frequency Modulation (FM), while video signals are transmitted by Amplitude Modulation (AM).

- 3. (2) Trade winds permanently blows from the northeast in the Northern Hemisphere and from the southeast in the Southern Hemisphere. They are the surface winds blow from the subtropical highs or horse latitudes towards the low pressure of the ITCZ. They are named by their ability to quickly propel trading ships across the ocean. They blow from 30 degree north and south of the Equator.
- 4. (3) The secondary growth in plants occurs due to the cell division in the lateral meristems or secondary meristems that helps to increase the thickness or the girth of the plants while primary growth is growth that occurs as a result of cell division at the tips of stems and roots, causing them to elongate, and gives rise to primary tissue. Lateral meristem is not responsible for growth in parenchyma, cortex or growth in length. In vascular plants, the secondary growth occurs due to the activity of the two lateral meristemsthe cork cambium and the vascular cambium. In woody plants, the secondary growth produces wood and gives shapes to the plant with a thickened trunk.
- The State Election Commissions constituted under the Constitution (Seventy-third and Seventy-fourth) Amendments Act, 1992 for each State/Union Territory are vested with the powers of conduct of elections to the Corporations, Muncipalities, Zilla Parishads, District Panchyats, Panchayat Samitis, Gram Pannchayats and other local bodies. The State Election Commission consists of a State Election Commissioner to be appointed by the Governor. They are independent of the Election Commission of India.
- The 'Vaipuliyasutra' which is also known as the 6.(2)Dictionary of Buddhism belongs to the Chinese and Tibetan Mahayana Buddhist sect. It is rather a collection of important Mahayana Sutras.
- 7. (1) Gibrat's law (sometimes called Gibrat's rule of proportionate growth or the law of proportionate effect) is a rule defined by Robert Gibrat (1904-1980) in 1931 stating that the proportional rate of growth of a firm is independent of its absolute size. The law of proportionate growth gives rise to a firm size distribution that is log-normal.
- 8. (1) Acetylene was used in the early 1900s as an anesthetic under the name Narcylene.

9. (1)

The Maharashtra's Avinash Sable paid the best 10.(2)possible tribute to late coach Nikolai Snesarev, posting a new national record time of 8 minutes 20.20 seconds to win the 3000m steeplechase at the Federation Cup Senior National Athletics Championships.

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- In nuclear reactors, fission of uranium is carried out by bombarding a slow moving neutron on uranium which results in emission of 3 more neutrons along with the biproducts. So, cadium rods are used to absorb extra neutrons in order to achieve controlled chain reaction. As cadmium easily absorbs slow moving neutrons they are used in nuclear reactor to control the fission rate. When cadmium rod is pushed into the reactor, the fission rate decreases and when it is pulled out the fission rate increases.
- 12. (3) As per Article 317, the Chairman or any other member of a Public Service Commission shall only be removed from their office by order of the President on the ground of "misbehaviour" after the Supreme Court, on reference being made to it by the President, has, on inquiry reported that the Chairman or such other member ought to be removed. The President may suspend the Chairman or other member of the Commission until report of the Supreme Court is received.
- 13. (3) Carbon monoxide is emitted during the combustion of fossil fuels. Carbon monoxide primarily causes adverse effects by combining with hemoglobin to form carboxyhemoglobin (HbCO) preventing the blood from carrying oxygen. So, Carbon monoxide is harmful to human beings as it has higher affinity for haemoglobin as compared to oxygen.
- 14. (1)
- A colloid is a mixture where a particular substance is trapped in a given dispersion medium but do not get mixed chemically. In the case of butter, the water molecules are trapped in between the fat particles and hence it forms a colloid.
- 16. (4) Consumer demand theory relates preferences for the consumption of both goods and services to the consumption expenditures; ultimately, this relationship between preferences and consumption expenditures is used to relate preferences to consumer demand curves. The link between personal preferences, consumption and the demand curve is one of the most closely studied relations in economics. It is a way of analyzing how consumers may achieve equilibrium between preferences and expenditures by maximizing utility subject to consumer budget constraints.

Market demand refers to the demand which is aggregate demand of number of individuals in the market while price level and general supply and general price level refers to the aggregate price and supply for number of individuals.

- The IIST (Indian Institute of Space Science and Technology) has partnered with the ISRO to undertake Joint Research Activities. The partnership model will be similar to the JPL-Caltech model followed by US Space Agency National Aeronautics and Space Administration(NASA).
- In India, "The Emergency" refers to a 21-month 18. (3) period from 1975 to 1977 when Prime Minister Indira Gandhi had a state of emergency declared across the country. Officially issued by President Fakhruddin Ali Ahmed under Article 352 of the Constitution because of the prevailing "internal disturbance", the Emergency was in effect from 25 June, 1975 until its withdrawal on 21 March, 1977. Thus, elections were suspended and civil liberties curbed.
- 19. (3) Neutrophils and lymphocytes are white blood cells, which are formed in bone marrow.
- Charles Freer Andrews was an Anglican priest and 20. (3) Christian missionary, educator and social reformer, and an activist for Indian Independence. He became a close friend of Rabindranath Tagore and Mahatma Gandhi and identified with the Indian liberation struggle. Andrews greatly admired the philosophy of the young Mohandas Gandhi and was instrumental in convincing him to return to India from South Africa, where Gandhi was a leading light in the Indian civil rights struggle there.
- 21. (4) The Minister of State for Tourism and Culture Shri Prahlad Singh Patel and the Chief Minister of Madhya Pradesh Shri Shivraj Singh Chouhan jointly inaugurated the 'Maharaja Chhatrasal Convention Centre' at Khajuraho, Madhya Pradesh. The Convention Centre has been developed under Swadesh Darshan Scheme of Ministry of Tourism.
- India ranked 40 among 53 global economies on the 22. (1) latest annual edition of the International Intellectual Property (IP) Index released by the US Chamber of Commerce Global Innovation Policy Centre (GIPC). The Index evaluates Intellectual Property rights in 53 global economies from patent and copyright policies to commercialisation of IP assets and ratification of international treaties.

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- 23. (3)
- 24. (1)
- 25. (2)