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గణిత చంద్రిక

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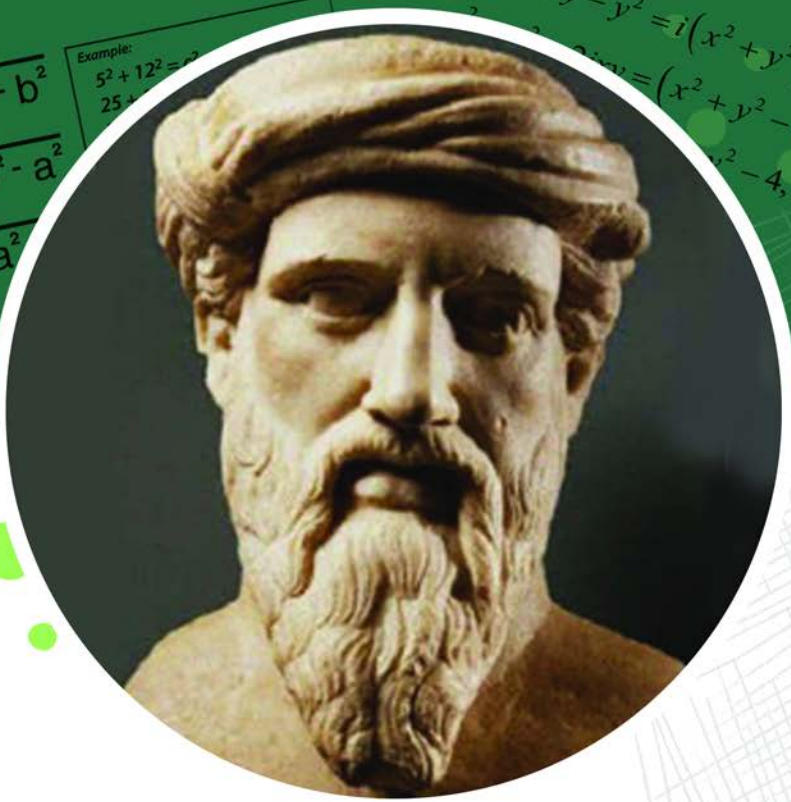

PYTHAGORAS

570 BC-495 BC

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విషయ సూచిక

సంపాదకీయం

పాఠకులందరికీ నమస్సుమాంజలి. ఈ గణిత చంద్రిక (vol. 22, Issue 3 &4) online లో ప్రచురింపబడుతున్నది. అందరూ గమనించగలరు. Pandemic దృష్ట్యా ఈ సంచిక ప్రచురణలో కొంత జాప్యం జరిగినందులకు క్షంతవ్యులం. యథావిధిగా మంచి వ్యాసాలతో, విషయాలతో ఈ సంచికను తయారు చేసి ఇస్తున్నాము. మీ అమూల్యమైన అభిప్రాయాలను, సూచనలను మాకు అందించి గణితచంద్రిక పురోభివృద్ధికి తోడ్పడగలరని ఆశిస్తున్నాము. రచయితల నుండి 2 పేజీల మించని పాఠశాల స్థాయి గణిత వ్యాసాలను ఆహ్వానిస్తున్నాము. విద్యార్థులు, ఉపాధ్యాయ మిత్రులు ఈ విషయం గమనించ ప్రార్థన.

మరొక్కసారి మీ అందరికీ శుభాభినందనలు.

Dr. B.B. రామశర్మ

ప్రధాన సంపాదకులు

ముఖచిత్ర పరిచయం - పైథాగరస్

పైథాగరస్ ప్రపంచ ప్రసిద్ధి గాంచిన ఒక గ్రీకు గణితశాస్త్రజ్ఞుడు. ఈయన పేరు విననివారు ఉండరు. పైథాగరస్ సిద్ధాంతం తెలియనివారు ఉండరు. గణిత శాస్త్రములో ముఖ్యంగా– జ్యామితి విభాగములో ఈయన గురించి తప్పక చదువుతారు.

పేరు	– Pythagoras
జననం	– c. 570 BC
మరణం	– c. 495 BC
సిద్ధాంతం / సంప్రదాయం	– Pythagoreanism
ముఖ్యవ్యాపకాలు	– Metaphysics, Music, Mathematics, Ethics, Politics
ప్రముఖ తత్వం	– Musica universalis, Golden ratio, Pythagorean tuning, Pythagorean theorem
ప్రభావితం చేసినవారు	– Thales, Anaximander, Pherecydes
ప్రభావితమైన వారు	– Philolaus, Alcmaeon, Parmenides, Plato, Euclid, Empedocles, Hippasus, Kepler

బాల్యం – విద్యాభ్యాసం

గణితవేత్త, తత్వవేత్త అయిన పైథోగొరస్ గ్రీసులోని సామోస్ అనే చోట జన్మించాడు. ఈ సామోస్ ద్వీపం అప్పట్లో పెద్ద వర్తక కేంద్రంగా, విద్యా కేంద్రంగా ఉండేది. పైథోగరస్ ధనవంతుల బిడ్డ కాబట్టి బాగానే చదువుకున్నాడు. చిన్నప్పటి నుండి ఈయన అసమాన ప్రజ్ఞాపాటవాలు ప్రదర్శించాడు. ఈయన ప్రశ్నలకు అధ్యాపకులే సమాధానాలు చెప్పలేక తలమునకలయ్యేవారు. ఈయనను చదువు నిమిత్తం థేల్స్ ఆఫ్ మిలెటస్‌కు పంపడం జరిగింది. అప్పుడే పైథోగొరస్ విశ్వవిఖ్యాతమైన తన సిద్ధాంతాన్ని రూపొందించాడు. ఒకరకంగా చెప్పాలంటే జ్యామితీయ గణితానికి బీజాలు వేసిన వారిలో ఈయన కూడా ఒకరు.

సిద్ధాంతాలు :

ఒక త్రిభుజంలోని కోణాల మొత్తం 180 డిగ్రీలు లేదా రెండు లంబ కోణాలని ఆయన చెప్పారు. బ్లెయిస్ పాస్కల్ కూడా అదే విషయాన్ని ఋజువు చేసారు. అదే విధంగా ఒక లంబకోణ త్రిభుజంలో కర్ణం మీది వర్గం మిగిలిన భుజాల మీది వర్గాల మొత్తానికి సమానం అనేది పైథోగొరస్ సిద్ధాంతం. ఒక త్రిభుజంలో భుజాల కొలతలు 3,4 అయి కర్ణం 5 అయితే $3^2+4^2=5^2$ అవుతుంది.

పరిశీలనలు :

ఆ కాలంలో పుస్తకాలు లేవు. చర్చల ద్వారానే విషయాల పట్ల అవగాహన యేర్పరచుకొనేవారు. ఈయన పెర్షియా, బాబిలోనియా, అరేబియా, భారతదేశంలో కొంతభాగం వరకు వెళ్లాడు. ఎన్నో విషయాలు తెలుసుకున్నాడు. ఈజిప్టులో ఎక్కువ కాలం ఉండి సంగీతం నేర్చుకున్నాడు. సంగీతానికి, అంకగణితమునకు మధ్య గల సంబంధముల గూర్చి పరిశీలనలు చేశాడు.

గురువుగా

దక్షిణ ఇటలీలోని క్రోటోనేలో క్రీ.పూ. 529లో ఒక పాఠశాల ప్రారంభించాడు. 300 మంది శిష్యగణం ఉన్న ఈ పాఠశాలలో అంకగణితం, జ్యామితి, సంగీతం, ఖగోళశాస్త్రాల గూర్చి బోధించేవారు. గ్రీకు తత్వశాస్త్రం కూడా చెప్పేవారు. పైథోగరస్ అతి సామాన్యంగా జీవించారు. సంఖ్యాశాస్త్రం పట్ల ఈయనకు చక్కటి అవగాహన ఉండేది. పిరమిడ్లను క్యూబ్‌లను చిత్రించేవాడు. రాత్రింబవళ్ళు భూమి సూర్యుని చుట్టూ లేదా సూర్యునిలాంటి ఖగోళ నిర్మాణాల చుట్టూ తిరుగుతూ ఉండటం వల్ల ఏర్పడుతున్నాయని ఈయన ఊహించాడు. ఏ సాధనాలు లేనప్పుడు ఇన్ని విషయాలు చెప్పే పైథాగరస్ అభినందనీయుడు.

ముగింపు

అనవసర రాజకీయాలు ముదిరి పైథాగరస్‌ను ప్రక్కకు నెట్టడం జరిగింది. ఆయన అజ్ఞాతవాసంలోకి వెళ్ళక తప్పలేదు. ఆ దిగులుతోనే ఎనభై యేళ్ళ వరకు బ్రతికి ఆ తరువాత ఇటలీలోని మెటోపోంటంలో క్రీ.పూ. 500లో కన్నుమూసాడు. ఈయన మరణించిన 200 సంవత్సరాల తర్వాత గ్రీకులు ఈయన గొప్పతనాన్ని గ్రహించి రోంలో ఒక విగ్రహాన్ని యేర్పాటు చేశారు. "అతి తెలివైన సాహసి"గా కితాబిచ్చారు.

IIT CAPSULE

Dr.B.B.RAMA SARMA

LIST OF IIT'S AND THEIR INFORMATION

The Indian Institutes of Technology (IITs) are the premier engineering institutes in the country. This article brings the list of All IITs in India- Total IIT Colleges in India NIRF Wise. As on 2022, there are a total of **23 IITs in India** offering both UG Programs and PG Programs. All IITs in India are linked to one another through the IIT Council, which oversees the overall administration. The NIRF Ranking list for the engineering category can be mistaken for a list of the IITs. Check the list below to know more about the top IITs in India.

All IITs in India by NIRF Ranking 2022

Every year, the Ministry of Human Resource Development (MHRD) of India releases the latest IIT rankings through the National Institutional Ranking Framework (NIRF). This article presents a list of the top IITs given by the NIRF Ranking list and their respective details.

Institution	NIRF Rank	State
IIT Madras	1	Tamil Nadu
IIT Delhi	2	Delhi
IIT Bombay	3	Maharashtra
IIT Kanpur	4	Uttar Pradesh
IIT Kharagpur	5	West Bengal
IIT Roorkee	6	Uttarakhand
IIT Guwahati	7	Assam
IIT Hyderabad	8	Telangana
IIT Dhanbad	11	Jharkhand
IIT Indore	13	Madhya Pradesh
IIT Varanasi	14	Uttar Pradesh
IIT Ropar	19	Punjab
IIT Patna	21	Bihar
IIT Gandhinagar	22	Gujarat
IIT Bhubaneswar	28	Orissa
IIT Mandi	41	Himachal Pradesh
IIT Jodhpur	43	Rajasthan
IIT Tirupati	Not Ranked	Andhra Pradesh
IIT Bilai	Not Ranked	Chattisgarh
IIT Goa	Not Ranked	Goa
IIT Jammu	Not Ranked	Jammu
IIT Dharwad	Not Ranked	Karnataka
IIT Palakkad	Not Ranked	Kerala

IIT Admission Procedure and Eligibility

Gaining admission into an IIT is a dream of many students across India. However, the process is not as simple as it might seem. Before students can crack their knuckles and get to the JEE for IITS, they must secure at least 75% aggregate in their Class XII exams with Physics, Chemistry, and Mathematics as core subjects. This exam is for the UG courses like B.Tech and B.Arch. For the PG courses offered by IIT, the entrance exams are different. These include exams like GATE, CEED, JAM, and JMAT. For Ph.D. candidates, the admission is done based on a written exam conducted by the respective IIT institution and a round of interviews. The admission process of the IITs is given below:

- JEE Main
- JEE Advanced
- Joint Seat Allocation Authority (JoSAA Counselling)

Courses Offered

All IITs in India offer three-degree programs that attract thousands of students to build a career in engineering. These courses are B.Tech, M.Tech, and Dual Degree (B.Tech-M.Tech). However, these prestigious institutions also offer other degree courses. Find below the table showing a list of courses offered at IITs in India:

- **Undergraduate**
  - Bachelor of Science [B.Sc]
  - Dual Degree B.Tech + M.Tech
  - Dual Degree B.Sc & M.Sc
  - Bachelor of Architecture
  - Bachelor of Design
- **Postgraduate**
  - Master of Science
  - Dual Degree M.Sc-Ph.D
  - Master of Design
  - Master of Business Administration
  - Master of Philosophy

All IITs in India offer B.Tech, M.Tech, Dual Degree, and Ph.D. programs that offer 100+ specializations. Computer Science Engineering, Mechanical Engineering, and Electrical Engineering are the most popular specializations among students wanting to pursue a B.Tech course. Find below a list of specializations offered at IIT in India at both UG and PG levels.

- Computer Science Engineering
- Mechanical Engineering
- Aeronautical Engineering
- Electrical Engineering
- Chemical Engineering

- Electronics & Communication Engineering
- Automobile Engineering
- Aerospace Engineering
- Petroleum Engineering
- Industrial Engineering
- Civil Engineering
- Electronics Engineering
- Marine Engineering

Scholarships

Students looking for financial assistance to pursue their studies at IITs can apply for various scholarships. However, these scholarships can vary every year, and so the students are requested to visit the website or contact the awarding body of the scholarships before applying for these schemes.

National Talent Search Scholarship (NTS)

This scholarship is awarded to students for their 10+2 education and can be continued for their undergraduate education. To renew the NTS scholarship, the students will have to submit the forms issued by the NCERT body to the academic section at the commencement of each academic year.

National Scholarships (All States)

This is a state scholarship that is awarded to students from their respective states. The applications for these scholarships are forwarded through IIT. These

scholarships are renewed every year, for which the students must submit their progress report at the beginning of the academic year.

Ministry of Social Justice and Empowerment, GOI, Central Sector Scholarship for SC Students

These scholarships are awarded to the top 10 students based on their respective JEE exam ranks, considering that their parental income is below INR 2 lakhs per annum. The provisions in this scholarship include:

A one-time payment of INR 45,000.

- Monthly expenses of INR 2,200 per month.
- Money awarded for books and stationery INR 3,000 per month.

Ministry of Tribal Affairs, GOI – Central Sector Scholarship for ST Students

This scholarship is awarded to the top 5 students based on their respective JEE ranks, with the condition that their parental income is less than INR 2 lakhs per annum. In addition, this scholarship offers the reimbursement of fees, monthly living expenses of INR 2,200 per month, and books and stationery expenses of INR 3,000 per annum.

Ministry of Minority Affairs, GOI Merit-cum-Means Scholarship

This scholarship is specifically awarded to the minority communities, namely Muslims, Christians, Sikhs, Buddhists, or Parsis, with the condition that their family income does not exceed INR 2.5 lakhs per annum. The

State Government sanctions the scholarship amount, and about 30% of the scholarship is reserved for girls. The scholarship includes Maintenance Expenses of INR 10,000 per annum for hostellers and INR 5,000 per month for day scholars. A reimbursement of the course fee up to INR 20,000 or the actual fees, whichever is less.

MHRD Scholarship for a Single Girl Child

According to the Government of India norms, the criterion for this scholarship is decided, and payment of INR 40,000 per year is awarded.

Aditya Birla Scholarship

The selection for this scholarship is made by the Aditya Birla Group and awarded to the top 20 students in the JEE exam rank. An amount of INR 60,000 per annum is provided, with an option to renew every year subject to the norms fixed by the Aditya Birla Group.

Inspire Scholarship (Department of Science and Technology, GOI)

Under this scholarship, the students admitted to the Dual Degree (BS & MS) and for the five years, Dual Degree (B.Tech & M.Tech) Programs are invited to apply and get rewarded an amount of INR 60,000 per annum for each student.

THE DELIGHTFUL NUMBERS

Gollakota V V Hemasundar
Head, Department of Mathematics
SIWS College, 337, Sewree-Wadala Estate
Wadala, Mumbai-400031

Do you have a favourite number?

Is it your date of birth? Probably Yes!

Although it is advised not to choose one's own date of birth in a password, most of the people do so because they believe it is a lucky number for them.

It is curious for almost everyone to know the specialty of his favorite number.

But a Mathematician is more curious about the mystery of every number he meets in day to day life. The Mathematician Littlewood, while talking about the great Indian legendary Mathematician Srinivasa Ramanujan remarked that "every positive integer was one of his personal friends".

The greatest Mathematician of 19 th century Gauss asserted that *"The Queen of Sciences is Mathematics and the Queen of Mathematics is Number theory".*

No doubt Mathematics is a language of communication where you can use numbers to communicate with accurate ideas. The German Mathematician Dedikind said,

"Numbers are free creations of the human mind that serve as a medium for the easier and clearer understanding of the diversity of thought".

Any student who has a little knowledge of Mathematics knows, a number is prime if it has only two factors namely '1' and itself. The prime numbers form the cornerstone of the theory of numbers. Many of the results in number theory are proved for primes and then proceed to prove the general case by using the Fundamental theorem of Arithmetic, which states that

Any natural number n > 1, can be written as a product of prime numbers.

For example, 108 = 2.2.3.3.3.

There is no simple formula for finding the n' th prime as well as to investigate a given number is prime or not. The prime numbers were distributed irregularly in the number system, that is, there are large gaps between primes. To say it in mathematical language,

for any given positive integer k, we can find k consecutive composite numbers, namely,

1(k + 1)! + 2,(k + 1)! + 3, . . . ,(k + 1)! + (k + 1).

Probably the only formula so far describes the distribution of primes is the **prime number theorem**, which states that $\pi(x)$ approaching asymptotically to $\frac{x}{\log x}$, written as

$$\lim_{x \to \infty} \frac{\pi(x)}{x / \log x} = 1$$

where p(x) denotes the number of primes $\leq$ x. It is a most surprising result because it is unexpected to see the prime numbers are tied with the natural logarithm function in a simple way. Any further discussion on this goes beyond the scope of this article.

There are some conjectures (A conjecture is an opinion or a judgement with out any formal proof) in the theory of numbers, which are easy to explain to a student of school but not been solved for hundreds of years! One such fascinating result is Goldbach Conjecture, which came up around the year 1740, and is still an open problem. This states that

Any even integer > 2 can be written as sum of two primes.

Starting with 4 =2+2, we can see 6=3+3, and 8= 3+5 etc.

There are many interesting results proved on prime numbers where some of the results have applications in the subject called Cryptography. In fact there is a book with the title "The Guiness book of prime number records"!

Every number has its own glory and mystery and some numbers connected with some historical background. If you ask for '2' this is the only number which is even as well as prime. If you ask for '6' this is the first perfect number (i,e. the sum of factors other than the number is equal to that number (here 1+2+3=6). Some perfect numbers have the following property:

$28 = 1^3 + 3^3$

$496 = 1^3 + 3^3 + 5^3 + 7^3$

$8128 = 1^3 + 3^3 + 5^3 + 7^3 + 9^3 + 11^3 + 13^3 + 15^3$

There are numbers which seem to be rather usual but with an unusual mystery. For instance 30, this is the largest number where all the numbers which are less than 30 and coprime to 30 (trivial case 1 is excluded) are prime numbers. For 17, Gauss proved it is possible to constuct a regular polygon with Ruler and Compass with 17 sides. So, no number can be left by a Mathematician with out bringing out its mystery.

At this junction, I would like to mention a delightful conversation between two world famous Number theorists G. H. Hardy and Srinivasa Ramanujan. Hardy was going to see Ramanujan when he was lying ill at Putney. He had ridden in taxi-cab No:1729 and remarked that the number(7.13.19) seemed to him rather a dull one, and he hoped it was not an unfavourable omen. Then immedietely Ramanujan replied "No" It is a very interesting number ; it is the smallest number expressible as a sum of two cubes in two different ways ($10^3 + 9^3 = 12^3 + 1^3$) . Then Hardy asked Ramanujan whether he Knew the answer to the corresponding problem for fourth powers; and Ramanujan replied after a moment's thought, that he could see no obvious example and thought that the first such number must be very large (Euler gave $158^4 + 59^4 = 134^4 + 133^4$).

The interest of studying numbers is not limited to just prime numbers, there are several fascinating results related to irrational numbers such as π, and Complex numbers: which are of the form a + ib where i is a symbol used to denote $\sqrt{-1}$. In fact, Euler considered π is one of the five primary numbers in Mathematics and found a following simple relation with other four numbers as follows:

$$e^{\pi i} + 1 = 0$$

where ($e^{i\theta} = \cot\theta + i \sin\theta$ is known as Euler's identity) Euler felt himself the existence of such a simple relation is a proof of the existence of God!

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THE MISSING LETTERS

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Letter and Symbol Series

Letter and Symbol Series are a sequential order of letters, numbers or both arranged such a way that each term in the series is obtained according to some specific rules. These rules can be based on mathematical operations, place of letters in alphabetical order etc.

Letter series is a logical arrangement of letters of English alphabet arranged in a specified pattern.

A series of letters, groups of letters or combinations of letters and numbers is given. Each group or single element is called term. The terms of the series form a certain pattern. We are required to identify this pattern and find the missing term(s) in the given series which will satisfy the pattern.

Types of Letter Series

There are mainly three types of letter series. They are as follows

Alphabet Series

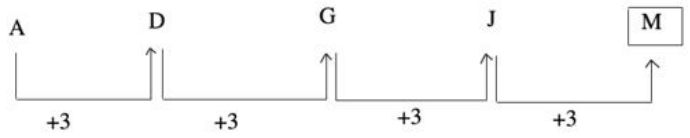
In this type, letters of English alphabet are arranged in a particular pattern like reverse order of letters, skipping of letters, position of letters in alphabetical order etc.

Example : Find the next term in the series.

A, D, G, J, ?

(a) K (b) L (c) M (d) N

Solution: (c) Pattern of the series is a shown below



Every next term of the series is next third letter of the alphabets (according to position).

Hence, the missing term is M.

Continuous Pattern Series

In this type, a series of small/capital letters are given which follow a particular pattern.

However, some letters are missing from the series. The series follows a specific pattern and candidates are required to find the letters which should come in place of the blank spaces or question marks.

Directions: *These questions are based on the letter series. In each of these series, some of the letters are missing. Select the correct alternatives.*

Example : abca_bcaab_ca_bbc_a

(a) ccaa (b) bbaa (c) abac (d) abba

Solution: (c) Pattern of the series is as shown below

abc / aabc / aabbc / aabbcc / a => abac

Hence, the missing letters are abac.

Mixed Series

[Alpha-numeric Series]

In this type, the series is based on the combination of both the letters and numbers.

Each term in the series follows a certain pattern based on either the alphabetical position of the letters or the numbers in different correlation.

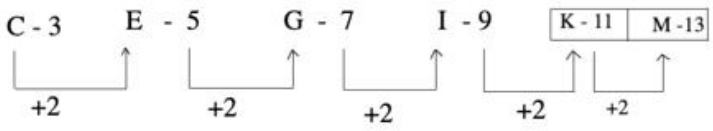
Example : Replace the question mark (?) in the following series with suitable option.

C-3, E-5, G-7, I-9, ?, ?

(a) M-18, K-14 (b) K-11, M-13

(c) X-24, M-21 (d) O-15, X-24

Solution: (b) Pattern of the series is as shown below



In this series, every letter is given its alphabetical position and one letter is skipped in between each term.

Hence, the missing terms are K-11, M-13.

SOME MORE PROBLEMS

1. D, H, P, F, L, X, __

   a. K b. G c. Y d. **V**

2. Some of the letters of the series are missing. This missing letters are given in same order as one of the four/five alternatives below the series. Find out the correct alternative.mc__m__a__ca__ca__c__mc·

   a. **acmmma** b. camcam c. aaacmm d. acmmca

3. Some of the letters of the series are missing. This missing letters are given in same order as one of the four/five alternatives below the series. Find out the correct alternative.

   _bb__c__bg__b__g

   a. cbcbg **b. cgbcb** c. cgbcc d.gbcbb

4. BD, GI, LN, QS, __?

   a. WX b. YW c. VT **d. VX**

5. CE, GI, KM, OQ, __?

   a. SU b. TW c. TV d. TR

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గణిత శాస్త్ర అష్టోత్తర శత నామావళి

1. శ్రీపదాయై నమ:
2. శ్రద్ధా కారణాయై నమ:
3. ధారాణాభివృద్ధి కారిణ్యై నమ:
4. మేధా కారిణ్యై నమ:
5. జిహ్వా గ్రహసదనాయై నమ:
6. శమాదిగుణదాయిన్యై నమ:
7. శాస్త్ర జనన్యై నమ:
8. కీర్తి ప్రదే నమ:
9. మనోరథదే నమ:
10. అజ్ఞానాంధకార వినాశిన్యై నమ:
11. పుష్ట్యై నమ:
12. తుష్ట్యై నమ:
13. ధృతిదాయై నమ:
14. నిత్యాయై నమ:
15. శ్రీ ప్రదాయై నమ:
16. భుక్తి ప్రదాయిన్యై నమ:
17. భోగ ప్రదాయిన్యై నమ:
18. ఆద్యన్త రహితాయ నమ:
19. జగన్మాత్రే నమ:

20. రాజ్యదాయై నమ:

21. అర్థశాస్త్ర జనన్యై నమ:

22. గాన గాంధర్వమూలాయై నమ:

23. మాపన కారిణ్యై నమ:

24. ఛందోదాయిన్యై నమ:

25. తర్కవ్యాకరణశాస్త్ర కారిణ్యై నమ:

26. కళా గుణ కారిణ్యై నమ:

27. భూగోళ శాస్త్రమూలాయై నమ:

28. అనంతాయై నమ: – నేర్చుకొనుచున్న కొలది ముగింపులేనిది.

29. బుధమానస విరాజితాయై నమ: – శ్రేష్ఠుల మనస్సులో నివశించేది.

30. ప్రమాణ దాయిన్యై నమ: – అన్నింటికి కొలతను ఇచ్చినది .

31. సర్వా శ్రయాయై నమ: – అన్నింటికి / అందరికి ఆశ్రయమైనది.

32. బహుశాస్త్ర సంపర్కాయై నమ: – అనేక శాస్త్రములతో కలయునది.

33. నానాశాస్త్రమకుటవిరాజితాయై నమ: –
అన్ని శాస్త్రములకు అలంకారము ఐనది.

34. మిత్యై నమ: – వ్యాప్తిని తెలుపునది.

35. అపరిమిత శాస్త్ర సంసేవితాయై నమ: –
ఎన్నోరకాలుగా ఎన్నో శాస్త్రములచే గౌరవము పొందునది.

36. గణనాధారాయై నమ: – లెక్కించుటకు ఆధారమైనది.

37. గణకాధారాయై నమ: – గణకునికి ఆధారమైనది.

38. సంఖ్యాయై నమ: – సంఖ్యల రూపమున ఉన్నది.

39. సాంఖ్యక శాస్త్రాయై నమ: – సాంఖ్యక శాస్త్రాధారము ఐనది.

40. విధానాధారాయై నమ: – విధానములకు ఆధారము ఐనది.

41. వేదాంతాధారాయై నమ: – వేదాంతానికి ఆధారమైనది

42. అనంతగుణ గంభీరాయై నమ: –
అనేక మంచి గుణములకు మూలము ఐనది.

43. భిన్న కారణాయై నమ: – భిన్నములకు మూల రూపము ఐనది.

44. పూర్ణ ప్రదాత్రే నమ: – అన్నింటిని ఇచ్చునది.

45. సంపూర్ణాయై నమ: – సంపూర్ణత్వము గలది.

46. అధ్యపనాధారాయై నమ: – భోధనకు ఆధారమైనది.

47. విద్యా స్వరూపాయై నమ: – విద్యకు స్వరూపమైనది.

48. అవిద్యా నాశిన్యై నమ: – అవిద్యను నశింపజేయునది.

49. గణన యంత్రాధారాయై నమ: – కంప్యూటర్లకు ఆధారమైనది.

50. సర్వ యంత్రాధారాయై నమ: – అన్ని యంత్రాలకు ఆధారమైనది.

51. సర్వ తంత్రాయై నమ: – అన్ని తంత్రాలకు ఆధారమైనది.

52. సర్వ మంత్రాధారాయై నమ: – అన్ని మంత్రాలకు ఆధారమైనది.

53. జ్యామిత్యై నమ: – రేఖా ఖండాలతో, రేఖలతో ఉండునది.

54. కోణ మానిన్యై నమ: – కోణములను కొలుచునది.

55. అవధానదాయై నమ: – అవధానమును ఇచ్చునది.

56. సత్త్వ గుణ కారిణ్యై నమ: – సత్త్వ గుణమును ఇచ్చునది.

57. తమోగుణ నాశనాయై నమ: – తమో గుణమును నశింపజేసేది.

58. సిద్ధాంతరూపాయై నమ: – సిద్ధాంత రూపము కలది.

59. విశ్వ వ్యాపిన్యై నమ: – విశ్వమంతా వ్యాపించినది.

60. అభివృద్ధి కారణాయై నమ: – అభివృద్ధికి కారణమైనది.

61. గణన శాస్త్రాయై నమ: – లెక్కించు శాస్త్రము.

62. అవ్యయాయై నమ: – ఎప్పటికి నశించనిది.

63. సంభవాయై నమ: – స్పష్టంగా ప్రకటమయ్యేది.

64. ఐశ్వర్య ప్రదాత్రే నమ: – ఐశ్వర్యమును ఇచ్చునది.

65. ధాత్రే నమ: – విశ్వ జ్ఞానమును ధరించునది.

66. మనోగ్రాహ్యాయై నమ: – మనస్సుచే గ్రహింపదగినది.

67. శాశ్వతాయైనమః – సర్వకాలములందు ఉండునది.

68. పవిత్రాయైనమః – అదరినీ పవిత్రులను చేయునది.

69. ధనదాయైనమః – ధనమును ఇచ్చునది

70. శ్రేష్ఠాయైనమః – అన్నిటికంటే శ్రేష్ఠమైనది.

71. మేధావ్యాశ్రితాయైనమః – మేధావుల దగ్గర ఉండునది.

72. క్రమాయైనమః – క్రమ పద్ధతితో నుండునది.

73. సత్యరూపిణ్యైనమః –

సత్యమునకు మరోరూపము/ సత్యమగు రూపముతో ఉండేది.

74. సత్య వచనాయైనమః – సత్యవచనము తెల్పునది.

75. సత్యప్రవచనాయైనమః – సత్య ప్రకటన చేయునది.

76. అచ్యుతాయైనమః – తనస్థితినుంచి ప్రక్కకు తొలగనిది

77. కాలస్వరూపాయైనమః – సమయరూపంలో ఉండునది.

78. సర్వశాస్త్ర వినిసృతాయైనమః – సర్వశాస్త్రములచే ఎరుగబడినది

79. అమోఘాయైనమః – శ్రమకు సంపూర్ణ ఫలితమిచ్చునది.

80. తాపనివారిణ్యైనమః – తాపమును పోగొట్టునది.

81. కృతాయైనమః – కార్యరూపంలో కన్పించునది.

82. భోజనదాయైనమః – భోజనమును ఒసగునది.

83. మహాబుద్ధిదాయైనమః – గొప్పబుద్ధినిచ్చునది.

84. అక్షరాయైనమః – ఎప్పటికీ నాశము పొందనిది

85. మహాశక్తి దాయైనమః – గొప్పశక్తిని ఇచ్చునది.

86. అనఘాయైనమః – పాపరహితమైనది.

87. నియమాయైనమః – నియమాలు కల్గినది.

88. సూత్రానుసారిణ్యైనమః – సూత్రమును అనుసరించి పోవునది.

89. ఆగమనాశ్రితసూత్ర సాధకాయైనమః–
ఆగమన పద్ధతిలో సూత్రమునిచ్చునది.

90. నిగమనాశ్రిత సమస్యాసాధకాయైనమః –
నిగమనపద్ధతిలో సమస్య సాధించునది.

91. ఘనపరిమాణ వైశాల్య మాపనాయై నమ:–
ఘనపరిమాణం, వైశాల్యములను కొలుచునది.

92. అవధి నిర్ణేతాయైనమః – హద్దును నిర్ణయించునది.

93. ఋణ, తటస్థ ధనాత్మకస్వభా వాయైనమః– ఋణ, తటస్థ, ధన స్వభావాలు (విలువలు) గలది.

94. ఋజు స్వభావాయైనమః – వక్రములేని నడక గలది.

95. దశాంశ సంకేతాయైనమః – దశాంశబిందు సంకేతంగలది.

96. దోషరహిత స్వభావాయైనమః – దోషరహిత స్వభావంగలది.

97. నిష్పత్త్యనుపాత మార్గ గామిన్యైనమః –
నిష్పత్తి, అనుపాతంలను అనుసరించి పోవునది.

98. పంచాగగణకాయైనమః –

పంచాంగముననుసరించుట, లెక్కించుట, తయారు చేయుట చేయునది.

99. పరిమాణాత్మకాయైనమః – పరిమాణము కలది, తెలుపునది.

100. అపరిమిత సమితిధారిణ్యైనమః – ఎన్నో సమితులు ధరించునది.

101. వ్యాపార సూత్రమూలాయైనమః – వ్యాపారశాస్త్ర మూలము ఐనది.

102. బీజస్థాన ప్రతిక్షేపిణ్యైనమః – బీజగణితంలో ప్రతిక్షేపించబడేది.

103. బీజాకారచరాత్మక స్వభావాయైనమః – బీజాలుగా చరరాసిగాఉండేది.

104. వృద్ధి గణకాయైనమః – వడ్డీలెక్కించునది.

105. పౌనఃపున్య విభాజిన్యైనమః – పౌనఃపున్య విభాజనము చేయునది.

106. భిన్న పరికర్మానుసారిణ్యైనమః – అనేక కర్మలు (పరిక్రియలు) భిన్నాలతో చేయునది.

107. శాస్త్ర సామ్రాజ్ఞినే నమః – శాస్త్రములకు రాణి ఐనది.

108. సకల శాస్త్ర శీర్ష విరాజితాయైనమః –

అన్ని శాస్త్రములకు శిరోభూషణం ఐనది.

విజయరామ శర్మ. కుందా

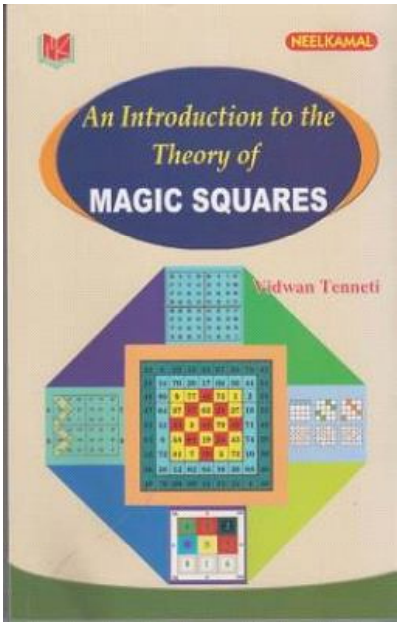
(లక్ష్మీ నాగ వెంకట విజయరామ ప్రహాద్. కుందా)

****

ఒక మంచి గణిత పుస్తకం

B. SINDHURA
B.Tech. M.B.A, Hyderabad

శ్రీ విద్వాన్ తెన్నేటిగారు రచించిన 'మేజిక్‌స్క్వేర్స్' అనే ఈ గణిత పుస్తకం పాఠకులను అలరించేలా ఉంది. మాయ చదరాలను రూపొందించిన విధానాలు చాలా బాగున్నాయి. నీల్‌కమల్ ప్రచురణలో వెలువడింది. అందరి వద్దా తప్పక ఉండదగ్గ పుస్తకం.



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SIMPLE INTEREST

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An organized professional with proven teaching, guidance, and counseling skills. Multidisciplinary creative research ability. Possesses a strong track record in improving test scores and teaching effectively. Ability to be a team player and resolve problems and conflicts professionally. Skilled at communicating complex information in a simple and enterprising manner. Looking to contribute my knowledge and skills that offer a genuine opportunity for career progression. Collaborated with peers to integrate new activities and allocate effectively the available resources.

Now a days it is quite common the people are lending money from banks or financiers and return with interest. The interest may be calculating monthly wise or yearly wise. So it is mandatory the students must learn about simple and compound interest.

Interest is defined as the cost of borrowing money, as in the case of interest charged on a loan balance. Conversely, interest can also be the rate paid for money on deposit, as in the case of a certificate of deposit. Interest can be calculated in two ways : simple interest and compound interest.

The official discovery of interest was found in 16th century by Jacob Bernoulli. He introduced a constant ‘e’

for the interest. He gave a formula limit n approaches infinity, where n represents the number of times the interest is compounded in a year.

The principal amount (P);The principal is the money borrowed or initial amount of money deposited in a bank. The principal is denoted by a capital letter “P.”

Interest (R): The extra amount you earn after depositing or the extra amount you pay when settling a loan. Interest is normally represented by a letter “R” because it is calculated as a rate or percentage.

Time(T): This is the period at which money is borrowed or deposited. Time is normally expressed in months or years. It is denoted by a capital letter “T.”

Amount(A): The amount is the sum of the total interest and the principal over a given period.

Simple Interest: Simple interest is the amount paid on a principal amount of money that is borrowed or loaned to someone. Similarly, you can as well earn an interest when you make a deposit of certain amount in a bank. Simple interest concept is majorly applied in various sectors including banking, mortgages, automobile, and other financial institutions

It is calculated on the principal or original amount of a loan. When interest is calculated on the original principal for any length of time, it is called simple interest.

Simple interest (S.I) $= \frac{PTR}{100}$

where: P = Principal R = Interest rate

T = Term of the loan

Amount = Principal + Interest (S.I)

i.e., A = P + SI

Clearly Principal(P) = (100×S.I.)/(R×T)

Rate(R) = (100×S.I.)/(T×P)

Time(T) = (100×S.I.)/(P×R)

Rate of simple interest differs from year to year, Where: R1, R2, R3 - - are the interest rates of Year 1, Year 2, Year 3 - - respectively

Example: 1. Rajiv takes a loan of Rs. 7000 from a bank at 10% as rate of interest. Find the interest he must pay at the end of one year.

Solution: Here sum borrowed, P = 7000

Rate of interest, R = 10%

At the end of the year T=1

$$SI = \frac{PTR}{100} = \frac{7000 \times 10 \times 1}{100} = 700$$

So, at the end of the year, the amount he has to pay back is

Amount = Principal + Interest (S.I)

= 7000+700 = ` 7700

Example-2: To buy furniture for a new apartment, Rahim borrowed ` 5000 at 11% simple interest for 11 months. How much interest will he pay?

Solution: Given Principal Amount P= ` 5000

Rate of interest R=11%

Time T=11months = 11/12 Years

$$\text{Simple interest} = 5000 \times \frac{11}{12} \times \frac{11}{100} = \text{Rs. } 504.16$$

Example- 3: In how many years will a sum of money triple itself, at 25% per annum simple interest.

Solution: Let the sum of money be P.

So, Amount A=3P and

Simple Interest S.I. = A - P = 3P - P = 2P

Given interest rate R=25%

$$\text{Time years. } T = \frac{100 \times I}{PR} = \frac{100 \times 2P}{P \times 25} = 8$$

In 8 years the sum of money triple at 25% interest per annum.

Example-4: Mr. Thomas invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years be Rs. 3508, what was the amount invested in Scheme B?

Solution: Let the amount invested in Scheme A be ` x at Interest rate R1=14% per annum

Then the amount invested in Scheme B be ` (13900 – x) Interest rate R2=11% per annum

After Two years i.e T=2

1. S.I on A = $\frac{x \times 2 \times 14}{100} = \frac{28x}{100}$

   S.I on B = $\frac{(13900-x) \times 2 \times 11}{100} = \frac{22(13900-x)}{100}$

2. After 2 years the simple interest (S.I) amount invested on Scheme A and amount invested on Scheme B is ` 3508

3. $\frac{28x}{100} + \frac{22(13900-x)}{100} = 3508$

   on simplification we get x = 7500

So, sum invested in Scheme B = 13900 – 7500 = 6400

Example-5: Rama took a loan of Rs. 1200 with simple interest for as many years as the rate of interest. If she paid Rs. 432 as interest at the end of the loan period, what was the rate of interest?

Solution: Given Principal amount P = `1200 and simple interest paid S.I = ` 432

Let rate of interest = R%

Given that rate of interest=time in years

Therefore time T= R years.

Simple interest $432 = \left(\frac{1200 \times R \times R}{100}\right)$

$\Rightarrow R^2 = 36 \Rightarrow R = 6\%$

Example 6: An automobile financier claims to be lending money at simple interest, but he includes the interest every six months for calculating the principal. If he is charging an interest of 10%, find the effective rate of interest.

Solution: Let the principal amount P=¹ 100.

Given that Rate of interest R=10%

First 6 months i.e T= 1/2

Then, first 6 months Simple interest becomes

Simple interest = `5

After 6 Months Principal amount is

P= 100+ interest = 100+5 = `105

Last 6 months Simple interest becomes

$S.I = \frac{PTR}{100} = \frac{105 \times 1 \times 10}{100 \times 2} = 5.25$

So, amount at the end of 1 year = `(100 + 5 + 5.25)

= `110.25

$\therefore$ Effective rate = (110.25 - 100) = 10.25%

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DIVISIBILITY RULES

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Divisibility rules in math are a set of specific rules that apply to a number to check whether the given number is divisible by a particular number or not. Some known divisibility tests are for numbers 2 to 20. It helps us to find the factors and multiples of numbers without performing long division. A person can mentally check whether a number is divisible by another number or not by applying divisibility rules. Let us learn more about divisibility tests in this article.

What are Divisibility Rules?

A divisibility rule is a kind of shortcut that helps us to identify if a given integer is divisible by a divisor by examining its digits, without performing the whole division process. Multiple divisibility rules can be applied to the same number which can quickly determine its prime factorization. A divisor of a number is an integer that completely divides the number without leaving any remainder.

In a 1962 Scientific American article, the popular mathematics and science writer, Martin Gardner, discussed divisibility rules for 2–12, where he explains that the rules were widely known during the renaissance and used to reduce fractions with large numbers down to the lowest terms. Since every number is not completely divisible by every other number, they may leave a remainder other than zero. There are certain rules which help us determine the actual divisor of a number just by considering the digits of that number. These are called divisibility rules.

Divisibility Rules From 2 to 12

In this section, we will learn about basic divisibility tests from 2 to 12. The divisibility rule of 1 is not required since every number is divisible by 1. Here are a few basic divisibility rules:

Divisibility by number	Divisibility Rule
Divisible by 2	A number that is even or a number whose last digit is an even number i.e. 0, 2, 4, 6, and 8.
Divisible by 3	The sum of all the digits of the number should be divisible by 3.
Divisible by 4	Number formed by the last two digits of the number should be divisible by 4 or should be 00.
Divisible by 5	Numbers having 0 or 5 as their ones place digit.
Divisible by 6	A number that is divisible by both 2 and 3.
Divisible by 7	Subtracting twice the last digit of the number from the remaining digits gives a multiple of 7.
Divisible by 8	Number formed by the last three digits of the number should be divisible by 8 or should be 000.
Divisible by 9	The sum of all the digits of the number should be divisible by 9.
Divisible by 10	Any number whose one's place digit is 0.
Divisible by 11	The difference of the sums of the alternative digits of a number is divisible by 11.
Divisible by 12	A number that is divisible by both 3 and 4.

Divisibility Rules Chart and Examples

Let's try to understand the above divisibility tests with examples.

- Is 280 divisible by 2? Yes, 280 is divisible by 2 as the unit's place digit is 0.
- Is 345 divisible by 3? Yes, 345 is divisible by 3, as the sum of all the digits i.e. 3 + 4 + 5 = 12, and 12 is divisible by 3. So, 345 is divisible by 3.
- Is 450 divisible by 4? No, 450 is not divisible by 4 as the number formed by the last two digits starting from the right, i.e 50 is not divisible by 4.
- Is 3900 divisible by 5? Yes, 3900 is divisible by 5 as the digit at the unit's place is 0 which satisfies the divisibility rule of 5.
- Is 350 divisible by 6? The sum of all the digits of 350 is 8, so it is not divisible by 3. Hence it cannot be divisible by 6, as a number needs to be a common multiple of both 2 and 3 to be a multiple of 6.
- 357 is divisible by 7 as when we subtract the twice of the ones place digit, 7 × 2 = 14, and subtract it from the remaining digits 35, we get 35 -14 = 21, which is divisible by 7. So, 357 is divisible by 7.
- 79238 is not divisible by 8, as the number formed by the last three digits 238 is not completely divisible by 8.
- 875 is not divisible by 9, as the sum of all the digits, 8 + 7 + 5 = 20 is not divisible by 9.

Now, let us take the number 1000 and see its divisibility by 2 to 10. It is clearly seen in the image that 1000 is divisible by 2, 4, 5, 8, and 10, and not divisible by 3, 6, 7, and 9. We find this by applying the divisibility rules of 2 to 10, and not by performing division which can be more time-consuming.

Divisibility Rules for Prime Numbers

Intermediate divisibility rules are applied to prime numbers which are less than 20 and greater than 10. Divisibility tests for prime numbers 2, 3, 5, 7, and 11 are already discussed above. Here, let's learn about the divisibility rules of 13, 17, and 19.

Divisibility Rule of 13 - A number is divisible by 13 when it leaves 0 as the remainder when we divide it by 13. The divisibility test of 13 helps us to quickly find out whether a number is divisible by 13 or not without performing long division. According to the divisibility rule of 13, first, we have to multiply the ones place digit by 4. Then, we add the product to the rest of the number to its left (excluding the digit at the unit's place). If that sum results in a number divisible by 13, then the original number is also divisible by 13.

Divisibility Rule of 17 - A number is divisible by 17 when 17 divides it completely without leaving any non-zero remainder. According to the divisibility rule of 17, first, we have to multiply the ones place digit by 5. Then, we subtract the product from the rest of the number to its left (excluding the digit at the unit's place). If that difference results in a number divisible by 17, then the original number is also divisible by 17.

Divisibility Rule of 19 - If we get 0 as the remainder when dividing a number by 19, then that number is considered divisible by 19. According to the divisibility rule of 19, first, we have to multiply the ones place digit by 2. Then, we add the product to the rest of the number to its left (excluding the digit at the unit's place). If that sum results in a number divisible by 19, then the original number is also divisible by 19.

Some Problems from MSET- 2018

CLASS - V

1. **Which digits have the same place value and face value in 9730465 ?**
   1) 7, 0 2) 3, 4 3) 0, 4 4) 0, 5
2. **Seventh set of co -primes from the bigining is ...**
   1) 71, 73 2) 59, 61 3) 41, 43 4) 51, 53
3. **8P79 - 36Q7 = 489R, then values of P, Q and R respectively are:**
   1) 2, 8, 5 2) 4, 9, 2 3) 4, 8, 2 4) 5, 8, 2
4. **If □ = 10 and Δ = -5 then which of the following represent 35?**
   1) □ □ □ Δ 2) □ □ Δ □ □
   3) □ □ Δ Δ Δ 4) □ Δ Δ Δ Δ Δ
5. **Ten years back the cost of sunflower oil is Rs. 25 per kg., but today it costs Rs.75 If Sheela purchased 6 kgs of sun flower oil now, how much more money she has to pay than 10 years back?**
   1) Rs. 300 2) Rs. 350
   3) Rs. 250 4) need not pay more
6. **In 2010 Gopi purchased 200kgs. of rice for Rs.5000. In 2018 rate per Kg. of rice increased by Rs. 15. How many kgs. of rice will come for the same amount?**
   1)150 2) 120 3) 160 4) 125

7. **a + p = a ; b - p = b; c x p = p and p/d = p then p = ...**

1) 1 2) 0 3) 1or 0 4) 1 and 0

8. **The date of birth of Srinivasa Ramanujan .....**

1) 22nd March 2) 22nd December

3) 14th November 4) 14th April

9. **Tangram puzzle belongs to :**

1) India 2) Japan 3) China 4) Srilanka

10. **If P x 750 = 13,500 and Q x 970 = 11,640 then (P+Q) - (P-Q) = ...**

1) 36 2) 24 3) 12 4) 6

11. **Units digit in the sum of $6^{2018} + 5^{2018} + 9^{2018}$ is .....**

1) 0 2) 1 3) 4 4) 2

12. **Seventh term in the series : 1, 6, 15, 28, ...**

1) 66 2) 91 3) 85 4) 120

13. **A square of side 10cm. is cut into two equal rectangles. Perimeter of the square is P. Perimeter of rectangle is Q. Then which is true?**

1) 2Q - P =20 2) Q - P = 10

3) P - 2Q = 10 4) 2Q - P = 10

14. **Perimeter of a square is equal to perimeter of a rectangle. The side of the square is 8cm. Then possible length and breadth of the rectangle are:**

1) (13, 3) 2) (5, 10) 3) (12, 4) 4) both 1 and 3

15. $\frac{1}{2\times3}+\frac{1}{3\times4}+\frac{1}{4\times5}+.....\frac{1}{9\times10}=$ **.....**

1) $\frac{2}{3}$ 2) $\frac{2}{5}$ 3) $\frac{3}{4}$ 4) $\frac{3}{5}$

CLASS - VI

1. **The mathematician who worte the book "The Elements"?**
   1) Kaperkar 2) Euclid
   3) Newton 4) Mahalanobis
2. **The number of dots that can be arranged as a triangle:**
   1) 2 2) 5 3) 7 4) 10
3. **The whole number which satisfies P X P = P is**
   A) 1 B) 0
   1) only A 2) Only B
   3) Both A & B 4) neither A or B
4. **The _____ of two whole numbers is again a whole number.**
   A. Sum B. Difference C. Product D. Quotient
   1) A, B 2) A, C 3) B, D 4) B, C
5. **In finding L.C.M through division method, the values of X, Y, Z are**

x	24,	36,	48
3	6,	y,	12
z	2,	3,	4
	1,	3,	2

   1) 2, 9, 4 2) 4, 9, 2
   3) 6, 6, 2 4) 4, 6,2
6. **The terminal ray rotates with intial ray $\frac{3}{4}$ th of one full rotation, then the angle formed is**
   1) Obtuse angle 2) Stright angle
   3) Reflex angle 4) Acute angle
7. **The birth year of Srinivasa Ramanujan**
   1) 1729 2) 1887 3) 1920 4) 1947

8. **Who is popularly known as "Father of Indian Statistics"?**

1) Ramanujan 2) P.C.Mahalanobis
3) D.R.Kaprekar 4) B.Bhargav

9. **If 1st December is Sunday, the 1st January falls on ..**

1) Tuesday 2) Wednesday
3) Thursday 4) Saturday

10. **Value of (4.7x 13.26) + (9.4x 32.15) + (4.7x22.44) is**

1) 47 2) 470 3) 940 4) 4700

11. **There are some ducks at a pond. Half of them are swimming in the pond. One third of the remaining ducks are sleeping. The balance 10 ducks are grazing. Number of ducks =**

1) 24 2) 30 3) 60 4) 40

12. **If ∪ represent "-1"; ∩ represent "+1" then the value of -3 corresponds to the figure:-**

1) ∪∩∪∩∪∩ 2) ∪∪∩∪∪
3) ∪∩∩∪∩ 4) ∩∪∪∩∪∪

13. **Next number in the series 1, 4, 27, 256, 3125....**

1) 39456 2) 46656 3) 36366 4) 42346

14. **x842 – 5y98 = zzzz then x – (y+z) =**

1) 8 2) 2 3) 3 4) 5

15. **Sum of four numbers is 240. The first number is one fourth of the sum of the other three numbers. Then the first number is**

1) 36 2) 48 3) 72 4) 64

CLASS - VII

1. **In a right angled isoscales triangle, the length of the hypotenuse is $4\sqrt{2}$ cms then the length of its side is**

   1) 4cm 2) 5cm 3) 2cm 4) 8cm

2. **Sum of all the factors of a perfect number, 'n' is**

   1) n 2) 2n 3) n-1 4) n-2

3. **The value of (a+z)+(b+y)+(c+x)+.....+(m+n) if a=1, b = 2, c = 3.....**

   1) 260 2) 135 3) 351 4) 130

4. **Which of the following is not an axiom related to congruency of triangle**

   1) Angle - Angle - Angle 2) Side - Angle - Side
   3) Side - Side - Side 4) Angle - Side - Angle

5. **P.C.Mahalanobis and C.R.Rao are the Indian Mathematicians worked in which branch of mathematics**

   1) Number Theory 2) Statistics
   3) Trigonometry 4) Plane geometry

6. **Digits when raised to any power occurs the same digit in units place of the resultant. Such digits are**

   1) 1, 4, 6 2) 1, 6, 8 3) 1, 5, 6 4) 1, 5, 9

7. **Which of the following number is divisible by 2, 3, 4, 6, 8, and 9**

   1) 1347312 2) 2531124
   3) 3014604 4) 1137096

8. Absolute prime among the following

1) 19 2) 23 3) 29 4) 31

9. Divide 40 by $\frac{1}{2}$ and add ten. What is the answer

1) 30 2) 50 3) 90 4) 20

10. We can get Ramanujan number from

1) $7 \times 11 \times 17$ 2) $7 \times 13 \times 19$

3) $7 \times 23 \times 9$ 4) $7 \times 19 \times 3$

11. In a zoo the ratio of the pigeons and rabbits is 2 : 3. Total heads are 200 then total legs =

1) 560 2) 580 3) 680 4) 640

12. If $4800 = 2^x \times 3^y \times 5^z$ then 5z - y =

1) $2x-3$ 2) $x+3$

3) $3x-5$ 4) 1 and 2

13. In a code language SHIP $\rightarrow$ HSRK; BANK $\rightarrow$ YZMP then FILE $\rightarrow$

1) USPV 2) UROV 3) VROU 4) VSPU

14. Ravi took a loan of Rs.65000 in a bank. After 6 years he paid an amount Rs.1,00,100 and cleared the loan. If simple interest is calculated, the rate of interest = -----

1) 9% 2) 11% 3) 12% 4) 6%

15. $10 - \left[10 - \left\{10 - \left(10 - \overline{10-1}\right)\right\}\right] =$

A) 1 B) 9 Truth Statement is

1) only A 2) Only B

3) A or B 4) Neither A nor B

CLASS - VIII

1. $\sqrt{1+\frac{55}{729}} = 1+\frac{x}{27}$ **then x = ...**

   1) 1 2) 3 3) 5 4) 7

2. **If** $2^x = 3^y = 6^{-z}$ **then** $\left(\frac{1}{x}+\frac{1}{y}+\frac{1}{z}\right)$ **= .....**

   1) 1 2) 0 3) $-\frac{1}{2}$ 4) $\frac{3}{2}$

3. **Author of the famous book 'How to Solve It' is .....**

   1) George Cantor 2) Rubrik
   3) George Polya 4) Kaprekar

4. **A. The sides 4cm, 4cm, and 9 cm form an isosceles triangle.**

   B. The sides 4cm, 5cm and 3 cm form a right angle triangle.

   Then the truth statement :

   1) A only 2) B only
   3) Both A and B 4) A and B are false

5. **A person incurs 5% loss by selling a watch forRs.1140. At what price should the watch be sold to earn 5% profit? (in Rs.)**

   1) 1260 2) 1250 3)1320 4) 1280

6. **The cube root of the reciprocal of** 27^2 **is .....**

   1) $\frac{1}{6}$ 2) 6 3) $\frac{1}{9}$ 4) $\frac{1}{27}$

7. **Number of diagonals in a n-sided polygon .....**

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

8. Mode of 'n' natural numbers .....

1) 0 2) (n/2)th term

3) (n+1)/2th term 4) Doesn't exist

9. If $a^m . a^n = a^{mn}$ then m(n - 2) + n(m - 2) = ...

1) 0 2) 1 3) -1 4) $\frac{1}{2}$

10. The wrong number in the series 2, 9, 28, 65, 126, 216, 344 is

1) 2 2) 28 3) 126 4) 216

11. The possible number of bold type Englich Alphabets(Capital) which have point symmetry:

1) 4 2) 5 3) 6 4) 2

12. The ratio of the area of a square to that of the square drawn on its diagonal is

1) 3 : 4 2) 2 : 5 3) 1 : 2 4) 3 : 5

13. By selling an article at 2/5 of the marked price, there is a loss of 25%. The ratio of the the marked price and the cost price is ....

1) 2 : 5 2) 5 : 2 3) 8 : 15 4) 15 : 8

14. The ratio of the length of parallel sides of a trapezium is 4:3 and the distance between them is 8 cm and the area is 42 sq.cm then the longer parallel side is (in cm.)

1) 4 2) 4.5 3) 7.5 4) 6

15. $1^3 + 2^3 + 3^3 + 4^3 + ... + 12^3 =$

1) $(6 \times 13)^2$ 2) $(4 \times 12)^2$

3) (6 x 12x13) 4) $(12 \times 13)^2$

CLASS - IX

1. **Arithmetic mean of first 200 odd numbers is**
   1) 2×5^4 2) 4×5^4 3) $2^3 \times 5^2$ 4) 4×5^3

2. **$x^2 - 8x + 1 = 0$ then $x^3 + \frac{1}{x^3} =$ _____**
   1) 284 2) 488 3) 500 4) 324

3. **An operation $\oplus$ is defined by $a \oplus b = (1-a)(1-b)$. If $(a \oplus 2a) \oplus (3a \oplus a)=0$; $(a>0)$ has roots α and β, then $\alpha \cdot \beta =$ _____**
   1) 2 2) $\frac{3}{2}$ 3) 4 4) $\frac{1}{4}$

4. **If $(x+y)^2 = 1+ 2xy$, then $x^2 (3-4x^2)^2 + y^2 (4-3y^2)^2$ = ____**
   1) 2 2) 0 3) 1 4) 12

5. **$3600 = 3^x 5^z 2^y$ where x, y, z $\in$ N then $3x + 5z + 2y =$**
   1) 24 2) 45 3) 28 4) 26

6. **Number of positive integer pairs (x,y) satisfying $3x + 4y = 11$ is _____**
   1)2 2) 1 3) 3 4) 4

7. **In ΔABC, $\angle B = 90°$, BC = 24cm and area is 120sq.cm then perimeter is ..... cm**
   1) 80 2) 100 3) 144 4) 60

8. **An equilateral triangle has height $4\sqrt{3}$ units. The area of triangle formed by mid points of its sides is _____ sq.u**
   1) $4\sqrt{6}$ 2) $\sqrt{48}$ 3) $3\sqrt{2}$ 4) $\sqrt{128}$

9. **Number of natural numbers that are divisible by either 5 or 7 in first 200 natural numbers is**
   1) 63 2) 48 3) 40 4) 68

10. Two sides of a scalane triangle are 3 and 5. Then the number of possible triangles with integral sides is

1) 5 2) 3 3) 4 4) 2

11. Number of 2 digit numbers that increase by 75% when their digits are interchanged is

1) 2 2) 4 3) 5 4) 8

12. 2014^{th} term in the sequence of 1, 1, 1, 2, 1, 3, 1, 4, 1, 5 .....

1) 2015 2) 1007 3) 1 4) 1012

13. The ratio of angles in a golden triangle :

1) 2 : 2 : 1 2) 1 : 2 : 3

3) 1 : 1 : 2 4) 1 : 1 : 3

14. Mean of some observation is 25. If all the scores are multiplied by 2 and added 3, the new mean is

1) 25 2) 53 3) 77 4) Can't find

15. The mean of 11, 18, P, 16, 15, 10 is 14. Then Median of the data :

1) 14 2) 14.5 3) 15 4) 15.5

CLASS - X

1. $\sin\theta + \sin^2\theta = 1$ then $\cos^2\theta + \cos^4\theta + 1 =$ .....

1) 2 2) 8 3) 3 4) 1

2. **If $1^2-2^2+3^2-4^2+.....+2007^2 - 2008^2$ is divisible by .....**

1) 37 2) 41 3) 53 4) 97

3. Who was popularly known as "Father of Statistics"?

1) R.A. Fisher 2) A.R.Mohanty

3) P.C.Mahalanobis 4) S. Ramanjan

4. **In the first 200 natural numbers the number of numbers which are neither divisible by 5 nor 7 nor 11**

   1) 124 2) 76 3) 48 4) 100

5. **Which of the following is Kaprekar's constant?**

   1) 6174 2) 6714 3) 6724 4) 6147

6. **a, b, c, d are 4 consecutive positive integers in A.P. Then which of the following is a perfect square?**

   1) abcd+1 2) ab+cd+1 3)ac+bd +1 4) a+b+c+d+1

7. **Number of positive integer ordered pairs (x,y) satisfying x + y =12 is 'a'. Then a^2-11a+7 =.....**

   1) **7** 2) 11 3) 4 4) 18

8. **Pictorial representation of statistical data by means of rectangles is .....**

   1) Frequency polygon 2) Histogram
   3) Instagram 4) cuboid

9. **Number of non-trival subsets of set of first 10 natural numbers is .....**

   1) 1024 2) 1020 3) 729 4) 1022

10. **Which of the following number is called "Armstrong" number?**

    1) 1729 2) 153 3) 28 4) 6179

11. **If Sec θ – Tan θ = λ then Tan θ = ...**

    1) $\frac{1}{2}\left(\lambda+\frac{1}{\lambda}\right)$ 2) $\left(\frac{\lambda^2+1}{4\lambda}\right)$ 3) $\frac{1}{2}\left(\frac{1}{\lambda}-\lambda\right)$ 4) $\frac{1}{4}\left(\lambda^2+\frac{1}{\lambda}\right)$

12. **The 40th triangular number is .....**

    1) 820 2) 670 3) 400 4) 576

13. If $\log_8 m + \log_8 \frac{1}{6} = \frac{2}{3}$ then m = ...

1) 4 2) 24 3) 16 4) $\frac{2}{8^3}$

14. If A= {-1,0,2,5} and B = {0,3,-2,18,6}; $f(x) = x^2 - x - 2$ then f(A) = ...

1) f(A)=B 2) $f(A) \subset B$

3) $B \subset f(A)$ 4) $f(A) \subseteq B$

15. A mathematician, who computed the total 1+2+3+....+99+100 in almost notime while he was just 10 years old

1) Ramanujan 2) Newton

3) Cantor 4) Gauss

Key for MSET = 2018 Questions

Class	Questions														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
V	4	2	4	2	1	4	2	2	3	2	4	2	1	4	2
VI	2	4	3	2	2	3	2	2	2	2	2	2	2	2	2
VII	1	2	3	1	2	3	4	4	3	2	4	4	2	1	2
VIII	1	2	3	2	1	3	3	4	1	4	2	3	4	4	1
IX	3	2	1	3	1	2	4	2	1	2	2	2	1	2	2
X	1	2	1	1	1	1	1	2	4	2	3	1	2	2	4


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