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AGNIPATH SCHEME

INDIAN ARMY AGNIVEER TECHNICAL

PHASE I Online Computer Based Written Exam (CEE)

50 Practice Sets

Equally Useful for Aginveer Technical (Aviation/Ammunition Examiner)

with OFFICIAL ONLINE PRACTICE TEST (SOLVED)

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AGNIVEER
TECHNICAL

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50 Practice Sets

Author
Major RD Ahluwalia

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ARIHANT PUBLICATIONS (INDIA) LIMITED

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SYLLABUS

GENERAL KNOWLEDGE

The test will include questions relating to India and its neighbouring countries especially pertaining to History, Culture, Geography and Who's Who. In addition Abbreviations, Sports, Awards and Prizes, Terminology, Indian Armed Forces, Continents and Sub Continents, Inventions and Discoveries, The Constitution of India, International Organisations, Books and Authors, Knowledge of Important Events that have happened in India and at world level in the recent years, Current Important World Events, Prominent Personalities, etc.

PHYSICS

Physical Properties and States of Matter, Mass, Weight, Volume, Density and Specific Gravity, Principle of Archimedes, Pressure Barometer, Motion of Objects, Velocity and Acceleration, Newtons Laws of Motion, Force and Momentum, Parallelogram of Forces, Stability and Equilibrium of Bodies, Gravitation, Elementary Ideas of Work, Power and Energy, Heat and its Effects, Sound Waves and their properties, Reflection and Refraction. Spherical Mirrors and Lenses, Type and properties of Magnet, Static and Current Electricity, Conductors and Non-conductors, Ohms Law, Simple Electrical Circuits, Heating.

MATHEMATICS

(i) Algebra
(ii) Matrices & Determinants
(iii) Analytical Geometry
(iv) Trigonometry
(v) Integral Calculus
(vi) Differential Calculus
(vii) Probability and Statistics
(viii) Number Systems
(ix) Fundamental Arithmetical Operations
(x) Mensuration
(xi) Area, Volume and Surface Area

CHEMISTRY

Physical and Chemical Changes, Elements, Mixtures and Compounds, Symbols, Formulae and Simple Chemical Equations, Law of Chemical Combination, Properties of Air and Water, Preparation and Properties of Hydrogen, Oxygen, Nitrogen and Carbondioxide, Oxidation and Reduction, Acids, Bases and Salts, Carbon and its forms, Natural and Artificial Fertilizers, Elementary Ideas about the Structure of Atom, Atomic, Equivalent and Molecular Weights, Valency.

Note The above syllabus is not a comprehensive list of topics pertaining to the subject. Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and such matters of everyday observation and experience as may be expected of an educated person. At times questions may be asked other than the above topics, but definitely within the syllabus of CBSE.

All About Online CEE

The screening of candidates will be carried out for following categories as per qualitative requirement.

S.NO.	Category	Education	Age
(a)	Agniveer (Technical)	10 + 2/Intermediate Exam Pass in Science with Physics, Chemistry, Maths and English with 50% marks in aggregate and 40% in each subject. *OR* 10+ 2/Intermediate Exam Pass from any recognized state education board or central education board to include NIOS and ITI course of minimum one year in required field with NSQF level 4 or above.	$17\frac{1}{2}$–23
(b)	Agniveer Technical (Aviation & Ammunition Examiner)		

Note : The upper age limit has been relaxed from 21 years to 23 years as a onetime measure for the Recruiting Year 2022-23.

Height & Weight - As per policy in vogue.

Relaxation in Physical Standards.

S.NO.	Category	Height (cms)	Chest (cms)	Weights (kgs)
(a)	For son of service & ex-servicement, war widow and widow of ex-servicemen.	2	1	2
(b)	For adopted son/son-in-law of a war widow, if she has no son. Adoption had done during the lifetime of a soldier will be valid for the purpose of award of bonus marks/Concessions and enrolment through UHQ enrolment.	2	1	2

Note : An elligible candidate can be grated prescribed relaxations in all three measurements i.e. height, chest and weight.

Special Physical Standards. As applicable.

Candidates will be tested as stated below

Physical Fitness Test (At Rally Site)							Remarks
1.6 km Run		Beam (Pull Ups)			9 Feet Ditch	Zig-Zag Balance	
Group	Time	Marks	Pull Ups	Marks	Need to Qualify	Need to Qualify	
Group-I	Group-I Up till 5 min 30 sec	60	10	40			
Group-II	5 min 31 sec to 5 min 45 sec	48	9 8 7 6	33 27 21 16			

Physical Measurement (At Rally Site)

Physical measurement will be carried out as per the Physical standards.

Medical Test

(a) As per laid down medical standards at the Rally Site.

(b) Unfit candidates will be referred to MH for specialist review. Candidates to report to designated Military Hospital within 5 days from referral and review medical exam to be completed by Military Hospital within 14 days as per policy.

Written Test through Common Entrance Examination (CEE)

(a) Will be conducted for medically fit candidates at nominated venue. Date and time of written test will be intimated at rally site and through Admit Cards.

(b) Admit Card for the CEE for the Rally Fit candidates will be issued at Rally Site itself.

(c) Admit Card for the CEE for the review Fit cases will be issued after getting medically fit by concerned specialist/specialists at MH.

Types of Questions

Asked in Exam and Sample Questions

General Knowledge

Though as per syllabus, this section is in examination, 10 questions will be asked from this section including reasoning.

- *After analysing previous papers, it has been concluded that rare questions are asked from History, Geography and Constitution till now.*
- *Majority of questions are asked from Sports, Culture, Static GK like Books and Author, Country and Capital etc.*
- *Sometimes 1-2 Question are also asked from current affairs.*

Sample Questions

1. Who wrote the song 'Sare jahan se Achchha'?
   (a) Ghulam Ali Khan
   (b) None of these
   (c) Rabindranath Tagore
   (d) Muhammad Iqbal
2. Havana is capital of which country?
   (a) Ghana (b) Finland
   (c) Cuba (d) Cyprus
3. Saina Nehwal is associated with which game?
   (a) Badminton (b) Chess
   (c) Tennis (d) Hockey

Reasoning

- *Though only 1-2 questions are be asked from this section but candidate must be required of proper knowledge and practice of basic reasoning chapters.*
- *Questions asked from this section may be from various topics viz., Classification, Series, Analogy, Coding-decoding, Sitting Arrangement Blood Relation etc.*

Sample Questions

4. Select the one which will complete the series B D G K ? V
   (a) P (b) M
   (c) N (d) Q
5. Complete the series P5QR, P4QS, P3QT, ……, P1QV
   (a) PQ3U (b) P2QU
   (c) PQV2 (d) PQW
6. Choose the missing alphabet which is shown by (?) out of the given alternatives : Y, B, T, G, O,?
   (a) M (b) L
   (c) K (d) N

Physics

- This section is most important from examination point of view as 15 questions are asked from this section.
  - *Questions asked from this section generally covers entire syllabus.*
  - *As type of question is concerned, questions are asked either directly from theory, formulae or numericals.*
  - *Sometimes 2-3 questions of applied type also has been asked.*
  - *Mostly questions have been asked from various topics viz; Mass, Weight, Volume, Motion, Laws of Motion, Archimede's Principal, Force, Work, Power and Energy, Heat, Waves, Ohm's Law, Magnet and Current Electricity etc.*

Sample Questions

7. The relation between initial velocity u, final velocity v and acceleration a and s being distance is :
   (a) $v = u + as$ (b) $v^2 - u^2 = 2as$
   (c) $c^2 - u^2 = as$ (d) $v + u = 2as$

8. Dyne is a unit of .....
   (a) Momentum (b) Power
   (c) Work (d) Force

9. Which of the following formula shows the relation between frequency (v) and wavelength λ of light?
   (a) $v = c\lambda$ (b) $\lambda = vc$
   (c) $\lambda = cv$ (d) $c = v\lambda$

Mathematics

- *Like Physics, this section is also very important from examination point of view as it also covers 15 questions.*
- *Questions asked from this section are easy to moderate, means, out of 15 questions, some questions are easy and some questions are moderate in level.*
- *However, candidate is required to practice the questions based on entire syllabus but questions based on some chapters like Number System, Basic Arithmetic (Percentage, Profit and Loss, Speed, Time and Distance, Work and Time, Unitary Method etc), Algebra, Mensuration, Geometry, Trigonometry, Calculus, Statistics have been asked on regular basis.*

Sample Questions (Official)

10. Cost of 1 kg rice is ₹15.5. Find the cost of 4 kg of rice.
    (a) 62 (b) 108.25
    (c) 96.45 (d) 88.5

11. Area of a Trapezium is ..... .
    (a) $b \times h$
    (b) $1/2\ (b \times h)$
    (c) $1/2\ (a + b) \times h$
    (d) $1/2\ (d_1 \times d_2)$

12. A 110 m long train is running at a speed of 60 km/h. How many seconds does it take to cross another 170 m long train standing on parallel track?
    (a) 18 sec (b) 15.6 sec
    (c) 17.2 sec (d) 16.8 sec

Chemistry

- *10 questions will be asked from this section.*
- *Type of question from this section till now has been asked either based on direct chemical formulae, symbol or direct theory.*
- *Sometimes 2-3 questions also has been asked based on chemical equations, applied questions, and numerical problems.*
- *Most of the topics of syllabus like Physical and Chemical Changes, Mixture and Compound, Symbols and Formulae, Carbon and its Compound, Atom, Molecular Weight, have been asked in the examination on regular basis.*

Sample Questions (Official)

13. Carbon when burns, produces carbon dioxide gas which is a/an
    (a) element
    (b) compound
    (c) homogeneous mixture
    (d) heterogeneous mixture

14. The ratio of charge and mass would be greater for
    (a) proton
    (b) electron
    (c) neutron
    (d) α-particle

15. How many elements were discovered at the time of Mendeleev?
    (a) 43 (b) 54
    (c) 63 (d) 76

Indian Army

Agniveer General Duty

Official Online Practice Test

1. Who was the tenth and the last Guru of the Sikhs?
(a) Guru Hargobind Dev (b) Guru Gobind Singh
(c) Guru Arjan Dev (d) Guru Nanak Dev

2. Who wrote the Arthashastra?
(a) Chanakya (b) Banabhatta
(c) Aryabhatta (d) None of these

3. The famous book 'Geet Govind' was written by
(a) Kalidas (b) Banabhatta
(c) Jayadev (d) Mirabai

4. Where is the Headquarter of United Nations?
(a) London (b) New York
(c) Geneva (d) New Delhi

5. The National Aeronautical Laboratory is situated at ..... .
(a) Hyderabad (b) Bengaluru
(c) Kolkata (d) Delhi

6. The national award given to the distinguished sportsmen/women in India is known as
(a) Bharat Award (b) Nehru Award
(c) Urvashi Award (d) Arjuna Award

7. Who is presently the Foreign Minister of India?
(a) Smriti Irani (b) Arun Jaitley
(c) Sushma Swaraj (d) S. Jaishanker

8. Who was the first lady Sultan of India?
(a) Nur Jahan (b) Kohinoor
(c) Raziya Sultana (d) Mumtaz Mahal

9. ..... was the founder of Indian National Army.
(a) Bhagat Singh
(b) JL Nehru
(c) Cap. Gen. Mohan Singh
(d) Rash Behari Bose

10. Where is the headquarters of the International Court of Justice?
(a) Rome
(b) Paris
(c) The Hague (Netherlands)
(d) Washington

11. The Jallianwala Bagh is located in ..... .
(a) Phagwara (b) Amritsar
(c) Gandhinagar (d) Ferozepur

12. Ahmedabad is located on the banks of which river?
(a) Narmada river (b) Banas river
(c) Luni river (d) Sabarmati river

13. Which state amongst the following does not share land boundary with Tamil Nadu?
(a) Telangana (b) Andhra Pradesh
(c) Kerala (d) Karnataka

14. When did World War II held?
(a) 1939-43 (b) 1939-45
(c) 1934-36 (d) 1935-38

15. When did Quit India Movement begin?
(a) 1929 (b) 1942 (c) 1940 (d) 1929

16. Who discovered oxygen?
(a) Albert Einstein (b) John Emburey
(c) Graham Bell (d) Joseph Priestly

17. Formation of curd by milk is done by ..... .
(a) Lactobacillus (b) Yeast
(c) Moulds (d) None of these

18. Which gas is available in abundance in atmosphere?
(a) Carbon monoxide (b) Oxygen
(c) Argon (d) Nitrogen

19. What is Orion?
(a) Constellation (b) Meteor
(c) Galaxy (d) Planet

20. ..... is essential in soil for plant growth.
(a) Carbon dioxide (b) Oxygen
(c) Nitrogen (d) Hydrogen

21. Polio is caused by a type of
(a) bacteria (b) virus
(c) fungus (d) None of these

22. Which type of pollution is responsible for acid rain?
(a) Soil pollution (b) Air pollution
(c) Water pollution (d) Noise pollution

23. How many colours are there in a spectrum of light?
(a) 5 (b) 1 (c) 7 (d) 3

24. Urea fertiliser is
(a) nitrogenous (b) potassium based
(c) phosphoric (d) mixed

25. What is required for the process of photosynthesis?
(a) Chlorophyll
(b) Carbon dioxide and water
(c) Sunlight
(d) All of the above

26. In nuclear reactor, heavy water is used as
(a) moderator (b) atomic smasher
(c) coolant (d) fuel

27. What is the chemical formula of salt?
(a) ZnC (b) NaCl (c) NaOH (d) KCl

28. ..... is produced by the vibration of bodies.
(a) Electricity (b) Light
(c) Thunder (d) Sound

29. Which colour objects absorb the most heat?
(a) White (b) Black
(c) Green (d) None of these

30. Which disease is caused due to the deficiency of iodine?
(a) Goiter (b) Scurvy
(c) Berry-Berry (d) Rickets

31. Ravi bought 1 shirt for ₹ 800 and sold for ₹ 900, find his profit percentage.
(a) 9 (b) 2.5 (c) 8 (d) 12.5

32. If $x + y = 4$ and $\frac{1}{x} + \frac{1}{y} = 4$, then find the value of $x^3 + y^3$.
(a) 52 (b) 25
(c) 4 (d) 64

33. If 10 men can do a piece of work in 4 days, how many men will be required to get the same work done in 5 days?
(a) 8 (b) 6
(c) 12 (d) 10

34. The average of 3, 6, 9, 6 is .....
(a) 20 (b) 6
(c) 22 (d) 8

35. A batsman scores 80 runs in his sixth innings are thus increases his average by 5. What is his average after six innings?
(a) 65 (b) 60
(c) 50 (d) 55

36. What is 25% of 200?
(a) 55.5 (b) 50
(c) 100 (d) 150

37. Which among the following is the largest four digit number that is divisible by 88?
(a) 9944 (b) 9988
(c) 9966 (d) 6888

38. A man loses 10% by selling his watch for ₹ 450. Find the cost price of the watch.
(a) ₹ 500 (b) ₹ 140
(c) ₹ 600 (d) ₹ 400

39. The number 20% more than 80 is .....
(a) 96 (b) 30
(c) 90 (d) 36

40. $34.36 - 45.67 + 86.56 = ? + 37.96$
(a) 37.29 (b) 36.29
(c) 37.49 (d) 32.29

41. A number added to its two-thirds is equal to 35. Find the number?
(a) 21 (b) 22
(c) 24 (d) 23

42. The area of a circle is 154 cm^2 whose radius is ..... ?
(a) 7 (b) 8
(c) 6 (d) 5

43. The diagonal and one side of a rectangular field are 289 m and 161 m respectively. Find the other side.
(a) 220 m (b) 180 m
(c) 230 m (d) 240 m

44. A can do a piece of work in 8h while B alone can do in 16 h. In how many hours, both A and B working together can finish the work?
(a) $5\frac{1}{2}$h (b) $5\frac{1}{4}$ h
(c) $5\frac{1}{3}$ h (d) $5\frac{2}{3}$ h

45. In equilateral triangle, angles are
(a) 60,60,60
(b) 60, 80, 60
(c) 90,30,60
(d) 90, 45, 45

46. Find the missing term in the series: 5760, 960, ?, 48, 16, 8
(a) 192 (b) 240 (c) 120 (d) 160

47. If TOM means 48 and DILB means 27, then HARRY stands for
(a) 50 (b) 60 (c) 67 (d) 70

48. Hat : Head : : Spectacles : ?
(a) Textiles (b) Eyes
(c) Mouth (d) Hat

49. In certain code word 'DELHI' is written in 'EFMIJ', then word 'BOMBAY' will be?
(a) MJXVSU (b) AIJMJX
(c) AMJWUR (d) CPNCBZ

50. 10, 16, 21, 25, ...
(a) 28 (b) 31
(c) 27 (d) 29

Answers

1 *(b)*	2 *(a)*	3 *(c)*	4 *(b)*	5 *(b)*	6 *(d)*	7 *(d)*	8 *(c)*	9 *(d)*	10 *(c)*
11 *(b)*	12 *(d)*	13 *(a)*	14 *(b)*	15 *(b)*	16 *(d)*	17 *(a)*	18 *(d)*	19 *(a)*	20 *(c)*
21 *(b)*	22 *(b)*	23 *(c)*	24 *(a)*	25 *(d)*	26 *(a)*	27 *(b)*	28 *(d)*	29 *(b)*	30 *(a)*
31 *(d)*	32 *(a)*	33 *(a)*	34 *(b)*	35 *(d)*	36 *(b)*	37 *(a)*	38 *(a)*	39 *(a)*	40 *(a)*
41 *(a)*	42 *(a)*	43 *(d)*	44 *(c)*	45 *(a)*	46 *(a)*	47 *(d)*	48 *(b)*	49 *(d)*	50 *(a)*

Solutions

1. (b) Guru Gobind Singh was the tenth Sikh Guru, a spiritual master, warrior, poet and philosopher. When his father, Guru Tegh Bahadur, was executed by the Mughal ruler Aurangzeb, Guru Gobind Singh was formally installed as the leader of the Sikhs at the age of nine, becoming the tenth and final human Sikh Guru. He founded the Sikh warrior community called Khalsa in 1699 and introduced the Five Ks, the five articles of faith that Khalsa Sikhs wear at all times. Guru Gobind Singh is credited with the Dasam Granth whose hymns are a sacred part of Sikh prayers and Khalsa rituals. He is also credited as the one who finalised and enshrined the Guru Granth Sahib as Sikhism's primary scripture and eternal Guru.

2. (a) Chanakya (375-283 BCE) was an ancient Indian polymath who was active as a teacher, author, strategist, philosopher, economist, jurist and royal advisor. He is traditionally identified as Kautilya or Vishnugupta, who authored the ancient Indian political treatise, the Arthashastra, a text dated to roughly between the fourth century BCE and the third century CE. He lived in the court of first Mauryan king Chandragupta Maurya.

3. (c) 'The Gita Govinda' is a work composed by the 12th-century Hindu poet, Jayadeva. It describes the relationship between Krishna, Radha and gopis of Vrindavan. The Gita Govinda is organised into twelve chapters. Each chapter is further sub-divided into one or more divisions called Prabandhas, totalling twenty-four in all.

4. (b) The United Nations (UN) is an intergovernmental organisation whose stated purposes are to maintain international peace and security, develop friendly relations among nations, achieve international cooperation, and be a centre for harmonising the actions of nations. It is the world's largest and most familiar international organisation. The United Nations is headquartered in Midtown Manhattan, New York City, United States.

5. (b) National Aeronautical Research Laboratory was setup in Delhi in 1959. In March 1960, it set up an office in the palace of Maharaja of Mysore, Bengaluru. It is India's first and largest aerospace research firm established by the CSIR. It concentrates on research in advanced topics in aerospace and related disciplines.

6. (d) 'Arjuna Awards' are given to distinguished sportspersons for Outstanding Performance in Sports and Games. It is the second-highest sporting honour of India, the highest being the Major Dhyan Chand Khel Ratna Award. The award is named after Arjuna, one of the characters of the Sanskrit epic 'Mahabharata' of ancient India. It is presented by Sports Authority of India.

7. (d) Subrahmanyam Jaishankar is an Indian diplomat and politician who is serving as the present Minister of External Affairs of the Government of India since 30th May, 2019. He is a member of the Bharatiya Janata Party and a Member of Parliament in the Rajya Sabha.

8. (c) Razia Sultana, was the first lady ruler of the Delhi Sultanate. She was the first female Muslim ruler of the subcontinent, and the only female Muslim ruler of Delhi. She belonged to the Slave dynasty and was the daughter of Iltutmish.

9. (d) The Indian National Army was first formed in 1942 under Rash Behari Bose by Indian Prisoners of War (PoW) of the British-Indian Army captured by Japan in the Malayan campaign and at Singapore.

This first INA, which had been handed over to Rash Behari Bose, collapsed and was disbanded in December that year after differences between the INA leadership and the Japanese military over its role in Japan's war in Asia. Rash Behari Bose handed over INA to Subhash Chandra Bose.

10. (c) The International Court of Justice is one of the six principal organs of the United Nations. It settles disputes between states in accordance with international law and gives advisory opinions on international legal issues.

It is headquartered in The Hague (Netherlands).

11. (b) The Jallianwala Bagh massacre took place on 13th April, 1919 on the day of Baisakhi. A large peaceful crowd had gathered at the Jallianwala Bagh in Amritsar, Punjab, to protest against the Rowlatt Act and arrest of pro-independence activists Saifuddin Kitchlew and Satyapal.

The crowd gathered was attacked on the order of General Dyer that led to a huge mass killing.

12. (d) Ahmedabad is located in Gujarat on the banks of Sabarmati river. It is also known as the Manchester of India and is the largest city in the state of Gujarat. Ahmedabad is famous for its textile industry, and is known as the textile hub of India.

13. (a) Telangana does not share the border with the state of Tamil Nadu. Tamil Nadu is a state in southern India and is tenth largest Indian state by area and the sixth largest by population, Tamil Nadu is the home of the Tamil people, whose Tamil language is one of the longest surviving classical languages in the world.

14. (b) World War II or the Second World War was a global conflict that lasted from 1939 to 1945. The vast majority of the world's countries, including all of the great powers, fought as part of two opposing military alliances: the Allies and the Axis. The war was by far the deadliest conflict in human history which resulted in 70 to 85 million fatalities, mostly among civilians.

15. (b) The Quit India Movement, also known as the August Kranti Movement, was launched at the Bombay session of the All India Congress Committee by Mahatma Gandhi on 8th August, 1942, during World War II, demanding an end to British rule in India. The Quit India Movement has rightly been described as the most massive anti-imperialist struggle on the eve of Partition and Independence.

16. (d) Oxygen is discovered by Joseph Priestly in 1774. Lavoisier recognised and named Oxygen in 1778. It is a highly reactive non-mental and an oxidizing agent. It's atomic number is 8.

17. (a) Formation of curd by milk is done by Lactobacillus. It produce lactic acid and reducing the pH of the milk. These bacteria convert the lactose into lactic acid.

18. (d) Nitrogen gas is available in abundance in atmosphere which makes up about 78% of air. It is a non-metal and the lightest element of group 15 of the Periodic Table.

19. (a) Orion is a prominent constellation located on the celestial equator and visible throughout the world. It is the most conspicuous and recognisable constellation in the night.

20. (c) Nitrogen is essential in soil for plant growth. It is a key component of amino acid which from the building blocks of plant proteins and enzymes.

21. (b) Polio is caused by a type of Virus which is also known as Poliomellatis. It infects your throat and intestines. It can also spread to your brain and spine causing paralysis.

22. (b) Acid rain is responsible for air pollution. This reaction begins when sulphur dioxide and nitrogen oxide are released into the air. These oxides are emitted by power plants and large industries.

23. (c) Spectrum of light has seven colours. When beam of light is passed through a glass prism the white light disperse into seven colours of light. The seven colours of spectrum of light are known as VIBGYOR. Violet has highest frequency and Red has lowest frequency.

24. (a) Urea fertilizer is nitrogenous because of its high content of 46% of nitrogen. Urea provide the plants with nitrogen to promote green leafy growth and make plant look lush.

25. (d) Photosynthesis process required all of these substances like carbon dioxide, water, sunlight and chlorophyll to create oxygen and energy in the form of sugar.

26. (a) In nuclear reactor, heavy water is used as moderator to slow down the neutrons produced during the fission reaction.

27. (b) Salt chemical formula is NaCl. It is called sodium chloride ions. Salt is present in vast quantities in seawater. It is a form of a natural crystalline mineral.

28. (d) Sound is produced by the vibration of bodies when it will be propagated through a medium from one point to another the energy produced in form of sound waves.

29. (b) Black colour object absorb the most heat because black colour object absorbs all wave length of light and reflected none.

30. (a) Goiter disease is caused due to deficiency of Iodine. It can lead thyroid gland that is generating too less hormone or too much hormone and it is a lump or swelling at the front of the neck caused by a swollen thyroid.

31. (d) Cost price (CP) of the shirt

$= ₹\ 800$

Seling price (SP) of the shirt

$= ₹\ 900$

Profit = SP − CP = ₹ (900 − 800)

$= ₹\ 100$

Profit percentage

$$= \frac{\text{Profit}}{\text{CP}} \times 100\%$$

$$= \frac{100}{800} \times 100\%$$

$$= 12.5\%$$

32. (a) Given, $x + y = 4$

$\Rightarrow \quad (x + y)^2 = 4^2$

$\Rightarrow \quad x^2 + y^2 + 2xy = 16$

Also, $\frac{1}{x} + \frac{1}{y} = 4 \Rightarrow \frac{x + y}{xy} = 4$

$\Rightarrow \quad \frac{4}{xy} = 4 \Rightarrow xy = \frac{4}{4} = 1 \qquad [\because x + y = 4]$

Now, $x^3 + y^3 = (x + y)$

$(x^2 - xy + y^2)$

$= (x + y)$

$= (x^2 - xy + y^2 + 2xy - 2xy)$

$= (x + y)(x^2 + y^2 + 2xy - 3xy)$

$= (x + y)[(x + y)^2 - 3xy]$

$[\because x + y = 4, xy = 1]$

$= (4)\,[(4)^2 - 3 \times 1]$
$= 4\,[16 - 3]$
$= 4 \times 13$
$= 52$

33. (a) Given, $M_1 = 10$, $D_1 = 4$,
$M_2 = ?$, $D_2 = 5$
We know that
$M_1D_1 = M_2D_2$
$\Rightarrow \quad 10 \times 4 = M_2 \times 5$
$\Rightarrow \quad M_2 = \dfrac{10 \times 4}{5} = 8$
So, required number of men = $M_2 = 8$

34. (b) Required average
$$= \frac{3 + 6 + 9 + 6}{4} = \frac{24}{4} = 6$$

35. (d) Let the batsman's average score after 5th inning $= x$
Total runs after 5th inning = $5x$
Given, $\dfrac{5x + 80}{6} = x + 5$
$\Rightarrow \quad 5x + 80 = 6x + 30$
$\Rightarrow \quad 6x - 5x = 80 - 30$
$\Rightarrow \quad x = 50$
Bastsman's average after 6th inning $= x + 5$
$= 50 + 5 = 55$

36. (b) 25% of 200 $= \dfrac{25}{100} \times 200 = 50$

37. (a) Largest four digit number = 9999
Now,
88) 9999 (113
− 88
119
− 88
319
− 264
55
So, the largest four digit number divisible by
$88 = 9999 - 55 = 9944$

38. (a) Given, loss % = 10%,
Selling price (SP) = ₹ 450
Cost price (CP)
$= \dfrac{100}{100 - \text{Loss}\%} \times \text{SP}$
$= \dfrac{100}{100 - 10} \times 450$
$= \dfrac{100 \times 450}{90}$
$=$ ₹ 500

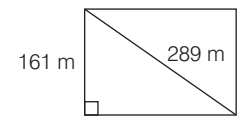
39. (a) The number 20% more than 80
$= (100 + 20)\%$ of 80
$= \dfrac{120}{100} \times 80 = 96$

40. (a) $34.36 - 45.67 + 86.56 = ?$
$+ 37.96$
$\Rightarrow \quad 120.92 - 45.67 - 37.96 = ?$
$\Rightarrow \quad ? = 75.25 - 37.96$
$= 37.29$

41. (a) Let the number be x.
Given, $x + \dfrac{2}{3} \times x = 35$
$\Rightarrow \quad \dfrac{3x + 2x}{3} = 35$
$\Rightarrow \quad 5x = 35 \times 3$
$\Rightarrow \quad x = \dfrac{35 \times 3}{5} = 21$

42. (a) Area of a circle = πr^2
$\Rightarrow \quad 154 = \dfrac{22}{7} \times r^2$
$\Rightarrow \quad r^2 = \dfrac{154 \times 7}{22} = 49$
$\Rightarrow \quad r = \sqrt{49} = 7$ cm

43. (d) In a rectangle, each angle is a right angle (90°).



By Pythagoras theorem,
Other side $= \sqrt{(289)^2 - (161)^2}$
$= \sqrt{83521 - 25921}$
$= \sqrt{57600}$
$= 240$ m

44. (c) A's one hour work $= \dfrac{1}{8}$
B's one hour work $= \dfrac{1}{16}$
($A + B$)'s one hour work
$= \dfrac{1}{8} + \dfrac{1}{16}$
$= \dfrac{2 + 1}{16} = \dfrac{3}{16}$
So, A and B together can finish the work in
$\dfrac{16}{3} = 5\dfrac{1}{3}$ h.

45. (a) In equilateral triangle, all three angles are equal to 60°.