# Free Study Material for AGNIVEER (Indian Army, Airforce & Navy)

**Q1.** Ottawa is the Capital of which of the following country?
(a) Netherlands
(b) Australia
(c) Austria
(d) Canada

**Q2.** Agra is situated on the bank of which river ?
(a) Ghataprabha river
(b) Yamuna river
(c) Ganga river
(d) Girna river

**Q3.** The Alps mountain range is located on which continent?
(a) Europe
(b) North America
(c) South America
(d) Africa

**Q4.** The Earth rotates around its axis from
(a) North to South
(b) South to North
(c) East to West
(d) West to East

**Q5.** Telephone exchange was invented by?
(a) Tivadar Puskas
(b) Joseph Priestley
(c) Petrache Poenaru
(d) James Leonard Plimpton

**Q6.** Tripitakas are related to
(a) Buddhism
(b) Jainism
(c) Hinduism
(d) Zoroastrians

**Q7.** Gandhiji's 'Satyagraha' meant an attachment to the following two elements -
(a) Knowledge and religion
(b) Truth and non-violence
(c) Truth and chastity
(d) Love of motherland and hate for colonial masters

**Q8.** The University Grants Commission (UGC) of India is a
(a) Constitutional Body
(b) Quasi-Statutory Body
(c) Neither statutory or Constitutional
(d) Statutory body set up by the Union government in 1956

**Q9.** The Governor takes the oath of office by -
(a) Chief Justice of High Court
(b) Chief Justice of India
(c) President of India
(d) Vice President of India

**Q10.** The author of the book "The Gin Drinkers" is
(a) Arundhati Roy
(b) Anita Desai
(c) Sagarika Ghose
(d) Shoba De

**Q11.** Which one of the following was most prominent feature of Indus valley civilization?
(a) Temples made for public prayers
(b) Urban culture
(c) Use of iron metals
(d) Worship of Mother-Goddess

**Q12.** In sixth century BC, Suktimati was the capital of
(a) Panchala
(b) Kuru
(c) Chedi
(d) Avanti

**Q13.** Who was the founder of the Satvahana Empire?
(a) Kanha
(b) Simuka
(c) Hala
(d) Gautamiputra

**Q14.** Fourteen rock edicts of Ashoka have been unearthed at
(a) Sasaram
(b) Kandhar
(c) Girnar
(d) None of these

**Q15.** Gandhara Art is the combination of
(a) Indo - Roman
(b) Indo - Greek
(c) Indo - Islamic
(d) Indo – China

**Q16.** The temples known as the Seven Pagodas had been built by the
(a) Pallavas
(b) Cholas
(c) Hoysalas
(d) Chalukyas

**Q17.** What is the name of the preaching mudra or gesture, in which the Buddha is depicted delivering his first sermon, in the Gandhara Sculptures?
(a) Abhaya
(b) Dharmachakra
(c) Dhyana
(d) Bhumisparsha

**Q18.** The Saka Era was founded in the year_____.
(a) B.C. 57
(b) A.D. 78
(c) A.D. 319
(d) A.D. 248

**Q19.** Who was the founder of Nanda dynasty?
(a) Bimbisara
(b) Dhanananda
(c) Ramananda
(d) Mahapadamananda

**Q20.** Aryabhatta and Kalidasa were in the court of which Gupta Emperor?
(a) Kumara Gupta I
(b) Chandra Gupta II
(c) Samudra Gupta
(d) Skanda Gupta

**Q21.** Who built Jama Masjid?
(a) Guru Ramdas
(b) Shah Jahan
(c) Rao Jodhaji
(d) Mahatma Gandhi

**Q22.** Who founded the Pala Empire?
(a) Devapala
(b) Dharmapala
(c) Dhruva
(d) Gopala

**Q23.** Who wrote Akbarnama?
(a) Akbar
(b) Birbal
(c) Abul Fazal
(d) Bhagavan Das

**Q24.** Who among the following witnessed the reigns of eight Delhi Sultans?
(a) Ziauddin Barani
(b) Shams-i-siraj Afif
(c) Minhaj-us-siraj
(d) Amir Khusrau

**Q25.** The first Indian Hindi Scholar of the Mughal period was
(a) Malik Muhammad Jayasi
(b) Abdur Rahim
(c) Mulla Wajhi
(d) Chand Bardai

**Q26.** The Delhi Sultanate reached its maximum geographical limits during the reign of _____
(a) Alauddin Khalji
(b) Qutbuddin Mubarak Shah Khalji
(c) Muhammad bin Tughlaq
(d) Firuz Tughlaq

**Q27.** The foreign traveller who visited India during Vijayanagara period was
(a) Megasthenes
(b) Yuan Chwang
(c) Fa-Hien
(d) Nicolo Conti

**Q28.** Who was the founder of the Sena dynasty?
(a) Ballal Sena
(b) Hemanta Sen
(c) Lakshman Sen
(d) Vijay Sen

**Q29.** Which of the following revolts during Aurangzeb's period had a peasant agrarian background?
(a) Rajputs
(b) Jats and Satnamis
(c) Marathas
(d) Sikhs

**Q30.** From where the Mansabdari system was borrowed?
(a) Afghanistan
(b) Turkey
(c) Mongolia
(d) Persia

**Q31.** When did Hyder Ali die?
(a) 1782
(b) 1784
(c) 1785
(d) 1786

**Q32.** When was Simon Commission sent to India?
(a) 1919
(b) 1920
(c) 1927
(d) 1928

**Q33.** Who integrated 565 princely states into India?
(a) Bhagat Singh
(b) Jawaharlal Nehru
(c) Lal Bahadur Shastri
(d) Vallabhbhai Patel

**Q34.** When did Farrukhsiyar become the Mughal emperor?
(a) 1707
(b) 1712
(c) 1713
(d) 1719

**Q35.** When did Nadir Shah invade India?
(a) 1719
(b) 1739
(c) 1747
(d) 1748

**Q36.** Who was the founder of Maratha empire?
(a) Balaji Baji Rao
(b) Shivaji
(c) Sambhaji
(d) Shahu

**Q37.** Who founded the Brahmo Samaj?
(a) Bal Gangadhar Tilak
(b) Dayananda Saraswati
(c) Raja Rammohan Roy
(d) Swami Vivekananda

**Q38.** Who established Ramakrishna Mission?
(a) Bal Gangadhar Tilak
(b) Swami Dayanand
(c) Swami Shraddhanand
(d) Swami Vivekananda

**Q39.** When did Rani Lakshmibai die?
(a) June 1858
(b) April 1858
(c) March 1858
(d) December 1857

**Q40.** When was Indian Association formed?
(a) 1876
(b) 1885
(c) 1886
(d) 1893

**Q41.** To describe the motion of an object we first specify a
(a) The acceleration of the body
(b) Reference point
(c) The speed
(d) The direction of motion

**Q42.** The third equation of motion is
(a) $v^2 - u^2 = 2as$
(b) $v^2 = u^2 + 2at$
(c) $v^2 = u^2 + 2st$
(d) S = ut + ½ at^2

**Q43.** The equations of motion can be derived by using:
(a) Distance – time graph
(b) Velocity – time graph for non-uniform acceleration
(c) Displacement time graph
(d) Velocity – time graph for uniform acceleration

**Q44.** A body performs an accelerated motion, with uniform speed. The motion of body is
(a) Linear
(b) Circular
(c) Parabolic
(d) Irregular

**Q45.** The equations of motion for bodies moving with uniform acceleration are of
(a) 2 types
(b) 4 types
(c) 3 types
(d) 5 types

**Q46.** The equations of motion are valid for which of the following types of motion?
(a) Constant energy
(b) Uniformly accelerated
(c) Non-uniformly accelerated
(d) Motion along a curve

**Q47.** In uniformly accelerated motion, how many variables are required to fully describe the system?
(a) 1
(b) 3
(c) 4
(d) 2

**Q48.** Displacement of a body is a _____ quantity.
(a) scalar
(b) vector
(c) scalar and vector
(d) none of the mentioned

**Q49.** A train covers 60 miles between 2 p.m. and 4 p.m. How fast was it going at 3 p.m.?
(a) 60 mph
(b) 30 mph
(c) 40 mph
(d) 50 mph

**Q50.** A car starts from rest and accelerates uniformly to a speed of 72 km. p.h. over a distance of 500 m. Calculate the acceleration.
(a) 0.3 m/s2
(b) 0.4 m/s2
(c) 0.5 m/s2
(d) 0.6 m/s2

**Q51.** bullet fired from a gun can pierce a target due to its _____
(a) Mechanical energy
(b) Heat energy
(c) Kinetic energy
(d) Acceleration

**Q52.** The energy possessed by a body by the virtue of its motion is called _____
(a) Kinetic energy
(b) Potential energy
(c) Total energy
(d) Motion energy

**Q53.** The energy possessed by a body by the virtue of its position is called _____
(a) Kinetic energy
(b) Potential energy
(c) Total energy
(d) Position energy

**Q54.** Energy is _____
(a) Work
(b) The ability to create work
(c) Quantification of work
(d) Force multiplied by displacement

**Q55.** The unit of energy has been named after _____
(a) James Prescott Joule
(b) John Prescott Joule
(c) Jammie Joule
(d) Jessy Joule

**Q56.** When a body falls freely under gravity, then the work done by the gravity is _____
(a) Positive
(b) Negative
(c) Zero
(d) Infinity

**Q57.** When a gas filled in a cylinder fitted with a movable piston is allowed to expand, the work done by the gas is positive.
(a) True
(b) False
(c) may be or may not be
(d) none of the above

**Q58.** When a body slides against a rough horizontal surface, the work done by friction is _____
(a) Positive
(b) Zero
(c) Negative
(d) Constant

**Q59.** The total energy of the universe is constant.
(a) True
(b) False
(c) maybe or may not be true
(d) none of the above

**Q60.** How much mass is converted into energy per day in Tarapur nuclear power plant operated at 107 kW?
(a) 10g
(b) 9g
(c) 9.6g
(d) 2g

**Q61.** Which of the following is used for measuring long time intervals?
(a) Electrical oscillators
(b) Atomic clocks
(c) Decay of elementary particles
(d) Radioactive dating

**Q62.** Which of the following is a dimensional constant?
(a) energy
(b) Area
(c) Specific gravity
(d) Gravitational constant

**Q63.** Which of the following is a systematic error?
(a) Constant error
(b) Least count error
(c) Gross error
(d) Personal error

**Q64.** Can the diameter of a thread be measure by using a scale?
(a) Yes
(b) No
(c) maybe or may not be
(d) None of the above

**Q65.** What is the science that deals with every substance, its structure, its composition and changes?
(a) Botanical science
(b) Zoological science
(c) Chemistry
(d) Physics

**Q66.** Quantum physics deals with macroscopic phenomena.
(a) True
(b) False
(c) maybe or may not be
(d) None of the above

**Q67.** Which is the universal attractive force?
(a) Electromagnetic force
(b) Strong nuclear force
(c) Weak nuclear force
(d) Gravitational force

**Q68.** Why is climbing a lamp post harder than climbing up a tree?
(a) Because of parallel friction force
(b) Because of contact force between the bodies
(c) Because of Van der Wall's force
(d) Because of rope force

**Q69.** The average life of an Indian is 56 years. Find the number of times the human heart beats in the life of an Indian, if the heat beats once in 0.8 s.
(a) $20.4 \times 10^9$ times
(b) $2.5 \times 10^9$ times
(c) $2.2 \times 10^9$ times
(d) $6.1 \times 10^9$ times

**Q70.** What is the dimensional formula for Gravitational constant?
(a) $ML^2T^{-3}$
(b) $ML^{-1}T^{-2}$
(c) $ML^{-1}T^{-1}$
(d) $M^{-1}L^3T^{-2}$

**Q71.** The speed of light will be minimum while passing through-
(a) Glass
(b) Vacuum
(c) Water
(d) Air

**Q72.** The radius of curvature of the plane mirror is:
(a) Zero
(b) One
(c) Infinity
(d) Between one and infinity

**Q73.** Which one of the following is the best conductor of electricity?
(a) Mica
(b) Copper
(c) Gold
(d) Silver

**Q74.** Which is not used as Atomic fuel?
(a) Uranium
(b) Thorium
(c) Plutonium
(d) Lead

**Q75.** The gas used in discharge tubes for optical decoration and advertising is-
(a) Carbon dioxide
(b) Ammonia
(c) Sulphur dioxide
(d) Neon

**Q76.** The maximum density of water is at
(a) 373 Kelvin
(b) 277 Kelvin
(c) 273 Kelvin
(d) 269 Kelvin

**Q77.** The technique to integrate and mark the image of a three- Dimensional object is-
(a) Audiography
(b) Lexieography
(c) Photography
(d) Holography

**Q78.** Which type of electromagnetic radiation is used in the remote control of a television receiver?
(a) Visible
(b) Ultra-violet
(c) Infra-red
(d) None of the above

**Q79.** Which one of the following is not correct:
(a) Theory of evolution was propounded by Charles Darwin.
(b) The breaking apart of the nucleus of an atom is called fusion.
(c) 'Dry ice' is nothing but solid carbon dioxide.
(d) Telephone was invented by Graham Bell.

**Q80.** Among the following radiations, which has the highest energy?
(a) Visible
(b) X-ray
(c) Ultra-violet
(d) Infra-red

**Q81.** What is measured by manometer?
(a) Air pressure
(b) Pressure of gas
(c) Density of liquids
(d) Pressure of oil on the surface

**Q82.** 'Pyrheliometer' is used for measuring:
(a) Sun spots
(b) Solar radiation
(c) Air temperature
(d) Temperature of plants

**Q83.** Spherical form of raindrop is due to-
(a) Density of liquid
(b) Surface tension
(c) Atmospheric pressure
(d) Gravitational force

**Q84.** Pressure inside a soap bubble is-
(a) More than atmospheric pressure
(b) Less than atmospheric pressure
(c) Equal to atmospheric pressure
(d) Half of atmospheric pressure

**Q85.** What happens if the control rods are not used in a nuclear reactor?
(a) The reactor will stop working
(b) Chain process would go out of bounds
(c) The reactor will be slow to act
(d) The reactor will continue to work as it is

**Q86.** For reproducing sound, a CD (Compact Disc) audio player uses a:
(a) Quartz
(b) Titanium needle
(c) Laser beam
(d) Barium titanic ceramic

**Q87.** Television signals cannot be received beyond a certain distance because:
(a) Signals are weak
(b) Antenna is weak
(c) Air absorbs signals
(d) The surface of the earth is curved

**Q88.** The principle reason why it is better to have two eyes than one is that:
(a) By having two eyes we can distinguish colour easily
(b) By having two eyes we can easily see in the dark as well in dim light
(c) It gives a man a type of vision known as mosaic vision
(d) It enhances distance and depth perception in us

**Q89.** In an earthen pitcher, the water remains cold due to the process of
(a) Condensation
(b) Evaporation
(c) Sublimation
(d) None of the above

**Q90.** The velocity of sound in air is approximately-
(a) 10 km/sec.
(b) 10 mile/min.
(c) 330 m/sec.
(d) 3 × 1010/sec.

**Q91.** The speed of the train going from Nagpur to Allahabad is 100 km/h while when coming back from Allahabad to Nagpur, its speed is 150 km/h. find the average speed during whole journey.
(a) 125 km/hr
(b) 75 km/hr
(c) 135 km/hr
(d) 120 km/hr

**Q92.** Rs. 2100 is lent at compound interest of 5% per annum for 2 years. Find the amount after two years.
(a) 2300
(b) 2315.25
(c) 2310
(d) 2320

**Q93.** Three numbers are in ratio 1 : 2 : 3 and HCF is 12. The numbers are:
(a) 12, 24, 36
(b) 11, 22, 33
(c) 12, 24, 32
(d) 5, 10, 15

**Q94.** A and B are two fixed points 5 cm apart and C is a point on AB such that AC is 3cm. if the length of AC is increased by 6%, the length of CB is decreased by
(a) 6%
(b) 7%
(c) 8%
(d) 9%

**Q95.** How many terms are there in 20, 25, 30 . . . . . 140?
(a) 22
(b) 25
(c) 23
(d) 24

**Q96.** The number of students in 3 classes is in the ratio 2 : 3 : 4. If 12 students are increased in each class this ratio changes to 8 : 11 : 14. The total number of students in the three classes in the beginning was
(a) 162
(b) 108
(c) 96
(d) 54

**Q97.** If a man were to sell his chair for Rs. 720, he would lose 25%. To gain 25% he should sell it for:
(a) 1200
(b) 800
(c) 950
(d) 1150

**Q98.** Ravi and Ajay start simultaneously from a place A towards B 60 km apart. Ravi's speed is 4km/h less than that of Ajay. Ajay, after reaching B, turns back and meets Ravi at a places 12 km away from B. Ravi's speed is:
(a) 7
(b) 12
(c) 8
(d) 15

**Q99.** Working 5 hours a day, A can Complete a work in 8 days and working 6 hours a day, B can complete the same work in 10 days. Working 8 hours a day, they can jointly complete the work in:
(a) 5
(b) 4
(c) 6
(d) 3

**Q100.** In how many ways can 8 Indians and, 4 American and 4 Englishmen can be seated in a row so that all person of the same nationality sit together?
(a) 3! 4! 8! 4!
(b) 3! 8!
(c) 4! 4!
(d) 8! 4! 4!

**Q101.** Two numbers are in the ratio 4 : 5. If their HCF is 16, then the sum of these two numbers is
(a) 144
(b) 124
(c) 160
(d) 150

**Q102.** Two numbers are in the ratio 4 : 7. If their HCF is 26, then the sum of these two numbers will be
(a) 312
(b) 364
(c) 338
(d) 286

**Q103.** Two numbers are in the ratio 5 : 11. If their HCF is 24, then the sum of two these numbers is:
(a) 384
(b) 408
(c) 120
(d) 264

**Q104.** Two numbers are in the ratio 6 : 11. If their HCF is 28, then the sum of these two numbers is:
(a) 476
(b) 448
(c) 392
(d) 420

**Q105.** Which of the following statement is true?
(a) HCF+LCM of two numbers=Product of two numbers
(b) LCM of two natural numbers is divisible by their HCF.
(c) Two prime numbers are co-prime numbers if their LCM is 1.
(d) HCF of two numbers is the smallest common divisor of both numbers.

**Q106.** The HCF and LCM of two numbers is 6 and 5040 respectively. If one of the numbers is 210, then the other number is :
(a) 630
(b) 144
(c) 256
(d) 30

**Q107.** A and B start walking together from a point. Their steps measure 72 cm and 84 cm respectively. What is the minimum distance they should walk so that each takes exact number of steps?
(a) 2.7 m
(b) 3.54 m
(c) 6.3 m
(d) 5.04 m

**Q108.** The product of two numbers is 45360; if the HCF of the numbers is 36, then their LCM is:
(a) 252
(b) 630
(c) 126
(d) 1260

**Q109.** The greatest number of four digits which is exactly divisible by 24, 36 and 54 is:
(a) 9990
(b) 9924
(c) 9936
(d) 9960

**Q110.** Four bells ring simultaneously at a certain instant. Thereafter they ring at intervals of 6, 8, 10 and 12 seconds respectively. In how many minutes will they ring together again for the first time?
(a) 2 minutes
(b) 2¼ minutes
(c) 1 minute
(d) 1½ minutes

**Q111.** The sum of the digits of a two-digit number is 10. The number formed by reversing the digits is 18 less than the original number. Find the original number.
(a) 64
(b) 46
(c) 28
(d) 82

**Q112.** A grinder was marked at Rs 3600. After given a discount of 10% the dealer made a profit of 8%. Calculate the cost price.
(a) Rs 3000
(b) Rs 3200
(c) Rs 2800
(d) Rs 3150

**Q113.** Arun is thrice as efficient as Sunil and is therefore able to finish a piece of work in 60 days less than Sunil. Arun and Sunil can individually complete the work respectively in.
(a) 20 and 80 days
(b) 40 and 100 days
(c) 25 and 85 days
(d) 30 and 90 days

**Q114.** If 72 workers can build a wall of 280 m length in 21 days. How many workers could take 18 days to build a similar type of wall of length 100 m?
(a) 25
(b) 32
(c) 30
(d) 40

**Q115.** An express train travelling at 48 km/hr crosses another train, having half its length and travelling in opposite direction at 42 km/h. in 12 seconds. It also passes a railway platform in 45 seconds. The length of railway platform is.
(a) 400 m
(b) 500 m
(c) 450 m
(d) 600 m

**Q116.** A man covers half of his journey at 6 km/hr and the remaining at 3 km/hr. His average speed is
(a) 4.5 km/hr
(b) 4 km/hr
(c) 5 km/hr
(d) 3.5 km/hr

**Q117.** In how many years a sum of Rs 3000 will yield an interest of Rs 1080 at 12% per annum simple interest?
(a) 2 yrs
(b) 4 yrs
(c) 3 yrs
(d) 5 yrs

**Q118.** The difference between the compound interest and the simple interest on a certain sum at 5% pe annum for 2 yrs is Rs 4.5. The sum is
(a) Rs 2400
(b) Rs 1800
(c) Rs 1500
(d) Rs 2000

**Q119.** If 40% of A's income is equal to 75% of B's income, then B's income is equal to x% of A's income. The value of x is
(a) 170/3
(b) 160/3
(c) 140/3
(d) 130/3

**Q120.** The difference between simple and compound interests compounded annually on a certain sum of money for 2 years at 4% per annum is Rs. 1. The sum (in Rs.) is:
(a) 625
(b) 630
(c) 640
(d) 650

**Q121.** A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?
(a) 3.6
(b) 7.2
(c) 8.4
(d) 10

**Q122.** A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?
(a) 120 m
(b) 180 m
(c) 150 m
(d) 324 m

**Q123.** In an election between two candidates, one got 55% of the total valid votes, 20% of the votes were invalid. If the total number of votes was 7500, the number of valid votes that the other candidate got, was :
(a) 2500
(b) 2700
(c) 2900
(d) 3100

**Q124.** A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:
(a) 650
(b) 690
(c) 698
(d) 700

**Q125.** The percentage increase in the area of a rectangle, if each of its sides is increased by 20% is:
(a) 32%
(b) 34%
(c) 42%
(d) 44%

**Q126.** The average of runs of a cricket player of 10 innings was 32. How many runs must he make in his next innings so as to increase his average of runs by 4?
(a) 76
(b) 67
(c) 78
(d) 89

**Q127.** Find the value of 1/(3+1/(3+1/(3-1/3)))
(a) 3/10
(b) 10/3
(c) 27/89
(d) 89/27

**Q128.** If one-third of one-fourth of a number is 15, then three-tenth of that number is:
(a) 35
(b) 36
(c) 45
(d) 54

**Q129.** The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?
(a) 4
(b) 9
(c) 6
(d) 3

**Q130.** Find compound interest on Rs. 8000 at 15% per annum for 2 years 4 months, compounded annually
(a) 2109
(b) 3109
(c) 4109
(d) 6109

**Q131.** The square root of which of the following is a rational number?
(a) 1250.49
(b) 6250.49
(c) 1354.24
(d) 5768.28

**Q132.** What is the sum of digits of the least number, which when divided by 15, 18 and 24 leaves the remainder 8 in each case and is also divisible by 13?
(a) 17
(b) 16
(c) 15
(d) 18

**Q133.** If the six digit number 4x4y96 is divisible by 88, then what will be the value of (x + 2y)
(a) 13
(b) 10
(c) 12
(d) 11

**Q134.** The square root of which of the following is a rational number?
(a) 5823.82
(b) 22504.9
(c) 2460.14
(d) 1489.96

**Q135.** What is the sum of the digits of the least number, which when divided by 12, 16 and 54, leaves the same remainder 7 in each case, and is also completely divisible by 13?
(a) 36
(b) 16
(c) 9
(d) 27

**Q136.** If the seven digit number 74x29y6 is divisible by 72, then what will be the value of (2x + 3y)?
(a) 20
(b) 21
(c) 19
(d) 16

**Q137.** If the seven digit number 56x34y4 is divisible by 72, then what is the least value of (x + y)?
(a) 8
(b) 12
(c) 5
(d) 14

**Q138.** The Square root of which of the following is a rational number?
(a) 2361.96
(b) 2758.28
(c) 72568.4
(d) 62504.9

**Q139.** What is the sum of the digits of the least number, which when divided by 15, 15 and 27 leaves the same remainder 9 in each case and is also completely divisible by 11?
(a) 20
(b) 17
(c) 18
(d) 19

**Q140.** If the seven digit number $3x6349y$ is divisible by 88, then what will be the value of (2x + 3y) ?
(a) 32
(b) 30
(c) 28
(d) 35

**Q141.** In a certain code language, "TRUMP" is written as "46321" and "GRAIN" is written as "76598". How is "GRUNT" written in that code language?
(a) 23684
(b) 23847
(c) 67834
(d) 76384

**Q142.** In a certain code language, '-' represents 'x', '÷' represents '+', '+' represents '÷' and 'x' represents '-'. Find out the answer to the following question.
2 x 12 ÷ 32 – 5 + 4 = ?
(a) 17
(b) 34
(c) 28
(d) 30

**Directions (143-144): Select the related word/letter/number from the given alternatives.**

**Q143.** Electron : J.J. Thomson : : Proton : ?
(a) James Chadwick
(b) Nil Bohar
(c) John Dalton
(d) RutherFord

**Q144.** EFG : VUT : : JIH : ?
(a) SUW
(b) QRS
(c) QSU
(d) HFD

**Q145.** Select the missing number from the given series.
–8.25, –6.75, –5.25, –3.75, ?
(a) 2.25
(b) –2.25
(c) 2.5
(d) –2.5

**Q146.** Find out next letter in the following series.
EFG, JKL, OPQ, ?
(a) TVX
(b) TUX
(c) TUV
(d) TVW

**Q147.** In a certain language 'RAAM' is coded as 33 and 'RITIKA' is coded as '68' then how 'PIHU' be coded in the same language ?
(a) 169
(b) 54
(c) 58
(d) 48

**Q148.** Select the correct set which will fit in the given question.
18 * 6 * 9 * 27
(a) ×, ÷ and =
(b) ÷, × and =
(c) ×, + and =
(d) +, – and =

**Q149.** Pointing towards a girl, a man said, "She is daughter of only son of my father's wife". How that girl is related to man ?
(a) Aunt
(b) Daughter
(c) Mothers
(d) Sister

**Q150.** Priya cycles 8 km North, then turns east and cycles 3 km, then turns South and cycles 8 km, then turns to her right and cycles 6 km. Where is she now with reference to her starting position ?
(a) 3 km East
(b) 3 km West
(c) 10 km West
(d) 10 km East

**Q151.** Priya's school bus was facing north-west when it reached her school. After starting from her house, the bus took one left turn. one right turn and another left turn to reach her school. In which direction was the bus facing when it left Priya's house?
(a) South-east
(b) North-west
(c) South-west
(d) North-east

**Q152.** After starting from her house, Sameera walked a few meters towards the East. Front there, she took a right turn and walked 100 m, and then took a left turn and walked 30 m. Finally, she took a left turn again and walked 40 m to reach the market. If the air distance between her house and the market is 100 m, how far did Sameera walk towards the East initially from her house?
(a) 30 m
(b) 50 m
(c) 60 m
(d) 80 m

**Q153.** After starting from his house, Naren walked a few meters towards the east. From there, he took a right turn and walked 80 m, and then took a left turn and walked 20 m. Finally, he took a right turn again and walked 40 m reach the hospital. If the air distance between his house and the hospital is 130 m, how far did Naren walk towards the east initially?
(a) 50m
(b) 25 m
(c) 40 m
(d) 30 m

**Q154.** Rakesh starts walking from his house and then takes two left turns and one right turn to reach the market. If he is facing north on reaching the market, in which direction was Rakesh facing when he started from his house?
(a) North
(b) South
(c) East
(d) West

**Q155.** Starting from Anand's house, the school bus takes a right turn and covers 3 km. Then, it takes a left turn and covers 2 km. Finally, it takes a right turn again and covers 4 km to reach the school. On reaching the school, the but faces south-east. In which direction was the but facing when it left Anand's house?
(a) South-west
(b) South-east
(c) North-east
(d) North

**Q156.** Riya walked 90 m towards the north from her house, and then took a right turn and walked 60 m to reach the market. Then, she took a left turn and walked a few meters from the market to reach the post office, from where she took a left turn again and walked 160 m to reach the school. If the air distance between Riya's house and the school is 260 m, what is the air distance between the market and the post office?
(a) 180 m
(b) 120 m
(c) 150 m
(d) 100 m

**Q157.** Rinky walked 70 m towards the east from her house, and then took a right turn and walked 50 m to reach the post office. From there, she took a right turn again and walked 150 m to reach the market, from where she took a left turn and walked a few meters to reach the school. If the air distance between Rinky'shouse and the school is 170 m, what is the air distance between the market and the school?
(a) 70 m
(b) 90 m
(c) 100 m
(d) 120 m

**Q158.** Swati's school bus starts from her house and takes one left turn to reach the hospital. Then, it takes a right turn and covers 5 km Finally, it taken a left turn to reach her school. On reaching the school, the bus faces south-west. In which direction was the bus facing when it left Swati's house?
(a) North-east
(b) East
(c) North-west
(d) South-east

**Q159.** Mayank's house faces South. He leaves form the back gate of his house and walks 18m. Then he turns right and walks 28m. Then he turns right and walk 35m. Then he turns left and walks 12m. He then turns left and walks 17m. In which direction and how many meters away is he from the original position?
(a) 20 Meter North
(b) 17 Meter South
(c) 30 Meter west
(d) 40 Meter East

**Q160.** If South-East becomes North, North-East becomes west and so on, what will south-west become?
(a) North
(b) West
(c) East
(d) South

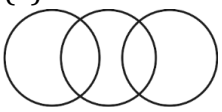
**Q161.** Select the number pair in which the two numbers are related. In the same way as are the tow numbers of the following number pair?
13: 16
(a) 15: 10
(b) 14: 16
(c) 12: 10
(d) 11: 6

**Q162.** Select the set in which the numbers are related in the same way as are the number of following set.
(3, 8, 16)
(a) (2, 9, 16)
(b) (4, 10, 20)
(c) (1, 2, 4)
(d) (5, 10, 12)

**Q163.** Select the option that is related to the third letter-cluster in the same way second Is related to the first letter - cluster.
ACDF: ZXWU:: BDEG:?
(a) YVWT
(b) YWVT
(c) XVWT
(d) XWVT

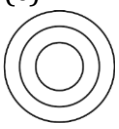
**Q164.** If + denote –, – denote *, * denote ×, × denote ÷, then what will be numerical value of
30 + 28 × 7 + 14 * 2.
(a) 2
(b) –4
(c) –2
(d) 0

**Q165.** Select the Venn diagram that best illustrates the Relationship between the following clauses
Cup, Tea, Coffee.
(a)

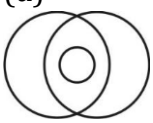


(b)

(c)



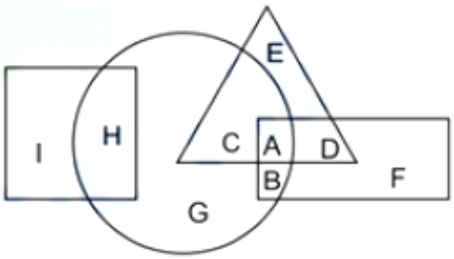
(d)



**Q166.** BOHMF is Codded as ANGLE, then what will be the third alphabet in the code for the word QBOLBK.
(a) P
(b) A
(c) K
(d) N

**Q167.** Select the option that is related to the third number in the same way as the second number is related to first number.
2743: 51 :: 3764:?
(a) 62
(b) 42
(c) 65
(d) 47

**Q168.** In the following figures, square represents Dentists, triangle represents Collectors, circle represents Indians and rectangle women. Which letter represents Indians who are both collector and women?




(a) A
(b) D, B
(c) C
(d) E, I

**Q169.** Which of the following option will fill the blank space in the following series?
aa_ _bcab _ d _ bc _ e
(a) bacad
(b) baacd
(c) bcabd
(d) bcbad

**Q170.** Which of the following option will replace the question mark (?) in the following series.

4, 14, 32, ?, 92
(a) 53
(b) 62
(c) 58
(d) 68

**Q171.** Which two signs should be interchanged to make the given equation correct?
4 + 8 × 12 ÷ 6 – 4 = 8
(a) × and +
(b) + and ÷
(c) – and +
(d) ÷ and –

**Q172.** Which of the following interchanges of signs and numbers would make the given equation correct?
8 ÷ 2 – 6 × 4 +3 = 13
(a) – and +, 6 and 4
(b) ÷ and +, 4 and 8
(c) × and ÷, 8 and 6
(d) × and –, 2 and 6

**Q173.** Which two numbers should be interchanged to make the given equations correct?
6 × 3 – 8 ÷ 2 + 5 = 8 ÷ 2 + 3 × 5 – 6
(a) 6 and 2
(b) 8 and 6
(c) 5 and 6
(d) 3 and 5

**Q174.** Which two numbers should be interchanged to make the given equation correct?
9 + 4 ÷ 2 –6 × 3 =4 ÷ 3 × 6-9 + 1
(a) 6 and 3
(b) 4 and 9
(c) 4 and 2
(d) 6 and 4

**Q175.** Which of the following interchanges of signs and numbers would make the given equation correct?
12 ÷ 4+2 – 6 × 3=3 ÷ 12+6× 2-4
(a) x and —, 4 and 6
(b) ÷ and +, 6 and 4
(c) x and ÷, 4 and 6
(d) - and+, 6 and 4

**Q176.** Which two signs should be interchanged to make the following equation correct?
18+12 × 8-6 ÷ 3=9
(a) + and ×
(b) - and ×
(c) × and ÷
(d) ÷ and +

**Q177.** Which two numbers should be interchanged to make the given equation correct?
4 × 2 – 8 + 9 ÷ 3 = 9 ÷ 3 + 4 × 2 – 8
(a) 3 and 4
(b) 3 and 2
(c) 8 and 3
(d) 8 and 4

**Q178.** Which of the following interchanges of signs and numbers would make the given equation correct?
12 × 18 ÷ 3 – 6 + 4 = 5
(a) ÷ and ×, 6 and 3
(b) ÷ and ×, 4 and 3
(c) ÷ and +, 3 and 4
(d) × and +, 3 and 6

**Q179.** Which two signs should be interchanged to make the following equation correct?
10 – 15 × 9 + 6 ÷ 3 = 9
(a) – and ÷
(b) ÷ and +
(c) + and –
(d) × and –

**Q180.** Which two signs should be interchanged to make the given equation correct?
9 + 12 ÷ 6 × 8 – 4 = 14
(a) – and ×
(b) + and ×
(c) ÷ and +
(d) × and ÷

**Q181.** Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?
(a) 8
(b) 10
(c) 7
(d) 12

**Q182.** Which word does NOT belong with the others?
(a) tyre
(b) steering wheel
(c) engine
(d) car

**Q183. Statements:** In a one day cricket match, the total runs made by a team were 200. Out of these 160 runs were made by spinners.
**Conclusions:**
80% of the team consists of spinners.
The opening batsmen were spinners.
(a) Only conclusion I follows
(b) Only conclusion II follows
(c) Either I or II follows
(d) Neither I nor II follows

**Q184. Statements:** No women teacher can play.
Some women teachers are athletes.
**Conclusions:**
Male athletes can play.
Some athletes can play.
(a) Only conclusion I follows
(b) Only conclusion II follows
(c) Either I or II follows
(d) Neither I nor II follows

**Q185.** FAG, GAF, HAI, IAH, ____
(a) JAK
(b) HAL
(c) HAK
(d) JAI

**Q186.** Pointing to a photograph of a boy Suresh said, "He is the son of the only son of my mother." How is Suresh related to that boy?
(a) Brother
(b) Uncle
(c) Cousin
(d) Father

**Q187.** Choose the word which is different from the rest.
(a) Cap
(b) Turban
(c) Helmet
(d) Veil

**Q188.** A, P, R, X, S and Z are sitting in a row. S and Z are in the centre. A and P are at the ends. R is sitting to the left of A. Who is to the right of P ?
(a) A
(b) X
(c) S
(d) Z

**Q189.** Arrange the given words in alphabetical order and tick the one that comes in the middle?
(a) Reprimand
(b) Reverence
(c) Amazed
(d) Disturb

**Q190.** In a queue, Amrita is 10th from the front while Mukul is 25th from behind and Mamta is just in the middle of the two. If there be 50 persons in the queue, what position does Mamta occupy from the front?
(a) $20^{th}$
(b) $19^{th}$
(c) $18^{th}$
(d) $17^{th}$

## SOLUTIONS

**S1. Ans.(d)**
**Sol.** Ottawa is the Capital of Canada. The Canadian dollar is the currency of Canada.

**S2. Ans.(b)**
**Sol.** Agra is situated on the bank of Yamuna River.

**S3. Ans.(a)**
**Sol.** The Alps are the highest and most extensive mountain range system that lies entirely in Europe, stretching approximately 1,200 kilometres across eight Alpine countries: France, Switzerland, Italy, Monaco, Liechtenstein, Austria, Germany, and Slovenia.

**S4. Ans.(d)**
**Sol.** The Earth rotates around its axis from west to east. Earth's rotation is the rotation of the solid Earth around its own axis. The Earth rotates from the west towards the east. As viewed from the North Star or polar star Polaris, the Earth turns counter-clockwise.

**S5. Ans.(a)**
**Sol.** Telephone exchange was invented by Tivadar Puskas.

**S6. Ans.(a)**
**Sol.** The Tripitakas are sacred books for Buddhists.

**S7. Ans.(b)**
**Sol.** Gandhiji's 'Satyagraha' meant an attachment to the two elements of Truth (Satya) and Non-violence (Ahimsa).

**S8. Ans.(d)**
**Sol.** The University Grants Commission of India (UGC India) is a statutory body set up by the Indian Union government in accordance with the UGC Act 1956[1] under the Ministry of Human Resource Development, and is charged with coordination, determination and maintenance of standards of higher education.

**S9. Ans.(a)**
**Sol.** According to article 159 every Governor and every person discharging the functions of the Governor shall, before entering upon his office, make and subscribe in the presence of the Chief Justice of the High court exercising jurisdiction in relation to the State, or, in his absence, the senior most Judge of that Court available.

**S10. Ans.(c)**;

**S11. Ans.(d)**
**Sol.** In Harappa numerous figures of women found having plant growing from embryo which represent earth goddess but in vedic text there is not much importance to mother goddess.

**S12. Ans.(c)**
**Sol.** Suktimati was the capital city of the Chedi Kingdom in India. It lay on the banks of the river Shuktimati flowing through Chedi. It was built by a Chedi king known as Uparichara Vasu.

**S13. Ans.(b)**
**Sol.** Simuka is described as the first king in a list of royals in a Satavahana inscription at Naneghat. The beginning of the Satavahana rule is dated variously from 271 BCE to 30 BCE.

**S14. Ans.(c)**
**Sol.** Fourteen rock edicts found in Girnar in Junagadh, Gujarat. It bears inscriptions in Brahmi.

**S15. Ans.(b)**
**Sol.** Gandhara Art is the combination of Indo-Greek style. Gandhara Art developed in first century AD. Both Shakas and Kushanas were patrons of Gandhara school.

**S16. Ans.(a)**
**Sol.** Seven Pagodas" has served as a nickname for the south Indian city of Mahabalipuram temple which is built by pallava king Narasimhavarman II.It is a shore temple on the bay of Bengal.

**S17. Ans.(b)**
**Sol.** In Buddhism, Dharmachakra mudra expresses the continuous energy (symbolized by a wheel/chakra) of the cosmic order. This mudra is associated with Buddha's first sermon, or teaching.

**S18. Ans.(b)**
**Sol.** Saka Era was adopted as the era of the Indian national calendar in 1957. The Saka era is the vernal equinox of the year AD 78. The year of the modern Saka Calendar is tied to the Gregorian date of 22 March every year, except in Gregorian leap years when it starts on 21 March.

**S19. Ans.(d)**
**Sol.** Mahapadma Nanda was the first king of the Nanda dynasty.

**S20. Ans.(b)**
**Sol.** Aryabhatta and Kalidasa were in the court of chandrgupta II.

**S21. Ans.(b)**
**Sol.** Mughal Emperor Shah Jahan built the Jama Masjid between 1644 and 1656. It was constructed by more than 5000 workers. It was originally called Masjid-i-Jahan Numa, meaning 'mosque commanding view of the world'.

**S22. Ans.(d)**
**Sol.** Dharmapala (ruled 8th century) was the second ruler of the Pala Empire of Bengal region in the Indian Subcontinent. He was the son and successor of Gopala, the founder of the Pala Dynasty. He greatly expanded the boundaries of the empire, and made the Palas a dominant power in the northern and eastern India.

**S23. Ans.(c)**
**Sol.** Abul Fazl was the author of Akbarnama, the official history of Akbar's reign in 3 volumes. This book gives the history of Akbar's forefathers from Timur to Humayun and Akbar's reign till 1602 AD. Abul Fazl was one of the nine jewels in the royal court of Akbar.

**S24. Ans.(d)**
**Sol.** Amir Khusrau (1253-1325) is regarded as the "father of qawwali" .He was an Indian musician, scholar and poet. He was an iconic figure in the cultural history of the Indian subcontinent.He is said to have witnessed the reigns of eight Delhi Sultans from 'Ghiyasuddin Balban to Sultan Muhammad bin Tughluq'.

**S25. Ans.(a)**
**Sol.** Malik Muhammad Jayasi was the first Indian Hindi Scholar. Malik Muhammad Jayasi (died 1542) was an Indian Sufi poet and pir. He wrote in the Awadhi language, and in the Persian Nastaʿlīq script. His best known work is the epic poem Padmavat.

**S26. Ans.(c)**
**Sol.** Their most prominent sultan was Muhammad bin Tughlaq. Under his reign, the Delhi Sultanate expanded its geographical boundaries to cover most of India.

**S27. Ans.(d)**
**Sol.** Nicolo Conti, an Italian, was at Vijayanagar in about 1420, just after the accession of Devaraya I. The first known foreign traveller, he mentions that the fortifications of the city and the thousands of men employed in the army of the rulers

**S28. Ans.(b)**
**Sol.** The dynasty's founder was Samanta Sena. After him came Hemanta Sena who usurped power and styled himself king in 1095 AD. His successor Vijaya Sena (ruled from 1096 AD to 1159 AD) helped lay the foundations of the dynasty, and had an unusually long reign of over 60 years.

**S29. Ans.(b)**
**Sol.** Satnamis, who were actually Hindus rebelled against Aurangzeb in 1672. Their leader was Birbhan. Satnamis lived in the region around Delhi. Satnamis fought with courage but they were defeated by the imperial army of Mughals and crushed to death. Jats also rebelled against Aurangzeb under the leadership of local Zamindar Gokala. They were never subdued completely and continued to resist the Mughal rule and when Aurangzeb died, they succeeded in establishing an independent Jat kingdom in Bharatpur.

**S30. Ans.(c)**
**Sol.** Mansabdar implies the generic term for the military-kind grading of all royal functionaries of the Mughal Empire. The Mansabdari system introduced by Akbar was borrowed from the system followed in Mongolia.

**S31. Ans.(a)**
**Sol.** Hyder Ali suffered from a cancerous growth on his back. He died in 1782.

**S32. Ans.(c)**
**Sol.** Simon Commission was sent to India in 1927. The British Government under Stanley Baldwin appointed a group to report on the working of the Indian constitution established by the Government of India Act of 1919.

**S33. Ans.(d)**
**Sol.** Vallabhbhai Patel integrated 565 princely states into India. He is often known as the "Iron Man of India" or "Bismarck of India".

**S34. Ans.(c)**
**Sol.** Farrukhsiyar became the emperor on 11 January 1713, at the age of 27.

**S35. Ans.(b)**
**Sol.** On 13 February 1739, Nadir Shah crushed the Mughal army in less than three hours at the huge Battle of Karnal.

**S36. Ans.(b)**
**Sol.** An independent Maratha kingdom was created with Raigad as its capital. In 1674, Shivaji was crowned as Chhatrapati of the new Maratha kingdom.

**S37. Ans.(c)**
**Sol.** In 1828 the Brahmo Samaj movement was founded by Raja Rammohan Roy. He is known as the father of modern India. The basis of Brahmo Samaj was the idea of a One God of all religions and humanity.

**S38. Ans.(d)**
**Sol.** Swami Vivekananda was the chief disciple of Ramakrishna Paramhamsa. The mission was founded on 1 May 1897 which is headquartered near Kolkata at Belur Math in Howrah, West Bengal.

**S39. Ans.(a)**
**Sol.** Rani Lakshmibai died June 1858 . Her tomb is in the Phool Bagh area of Gwalior.

**S40. Ans.(a)**
**Sol.** The association was founded in Bengal in 1876 by Surendranath Banerjee and Ananda Mohan Bose.

**S41. Ans.(b)**
Solution: Yes this is because we need to observe the motion of object or rest of object from any point called reference point.

**S42. Ans.(a)**
**Sol.** The third equation of motion is :-
($v^2 - u^2 = 2as$)
Here,
u = initial velocity
v = final velocity
a = acceleration
s = distance

**S43. Ans.(d)**

**Sol.**

Consider a velocity - time graph for a uniformly accelerated body starting from rest is represented as follows.

u = velocity at time $t^1$

v = velocity at time $t^2$

If acceleration is represented as a,

then, acceleration is defined as the rate of change in ve

$\Rightarrow a = v-u / t^2 - t1$

$\Rightarrow a = v-u /t$

Or, v-u = at

$\Rightarrow v= u + at$

**S44. Ans.(b)**

**Sol.** This is because in circular motion body is continuously changing its speed and acceleration is the change of velocity.

**S45. Ans.(c)**

**Sol.** The equations of motion for bodies moving with uniform acceleration are of 3 types.

**S46. Ans.(b)**

**Sol.** The three equations of motion are valid for uniformly accelerated motion. The equations do not work in situations where the acceleration is non-uniform. In that case it is better to work with the differential forms of velocity and acceleration.

**S47. Ans.(b)**

**Sol.** In uniformly accelerated motion, at least three variables are required to completely define the system This can also be found out by using the equations of motion. For finding out the value of any variable, we need at least three known quantities.

**S48. Ans.(b)**

**Sol.** The displacement of a body is a vector quantity, as it has both magnitude and direction. Linear displacement may, therefore, be represented graphically by a straight line.

**S49. Ans.(b)**

**Sol.** The speed is traveled distance (60 miles) divided by traveled time (4pm – 2pm = 2hours):

60 miles/ 2 hours = 30 mph

**S50. Ans.(b)**

**Sol.**

Given : u = 0 ; v = 72 km. p.h. = 20 m/s ; s = 500 m

First of all, let us consider the motion of the car from rest.

Acceleration of the car

Let a = Acceleration of the car.

We know that

$V^2 = u^2 + 2as$

or, 202 = 0 + 2a x 500 = 1000a

or, $a = 202/1000 = 0.4\ m/s^2$

**S51. Ans.(c)**

**Sol.** The kinetic energy of a body by virtue of its motion is called kinetic energy. A moving object can do work. Therefore a bullet fired from a gun can pierce a target due to its kinetic energy.

**S52. Ans.(a)**

**Sol.** The kinetic energy of a body emerges due to its motion. More specifically, the velocity of a body decides the amount of kinetic energy it has. Usually, the kinetic energy of a body with mass m is given as K.E. = (1/2)mv^2, where v is the velocity of the body.

**S53. Ans.(b)**

**Sol.** The potential energy of a body emerges due to its position. More specifically, the displacement of a body from the reference position decides the amount of potential energy it has. Usually, the potential energy of a body with mass m is given as P.E.=mgh, where h is the height of the body from the ground plane and g is the acceleration due to gravity. Absolute potential of a body cannot be found. Only the relative value can be found out.

**S54. Ans.(b)**

**Sol.** Energy is defined as the ability to create work. When a force is applied on a body to create displacement, work takes place. Work is quantified by the force applied by the displacement. Whereas the energy is the ability of the force to create work. In general, the total input energy = total output energy + work.

**S55. Ans.(a)**

**Sol.** The SI unit of energy is Joule. It has been named after the famous scientist James Prescott Joule. He made a significant contribution to the word of science by discovering the relationship of energy with mechanical work.

**S56. Ans.(a)**

**Sol.** If a force acting on a body has a component in the direction of displacement, then the work done by the force is positive. Hence when a body falls freely under the influence of gravity the work done by the gravity is positive.

**S57. Ans.(a)**

**Sol.** When a gas filled win a cylinder fitted with a movable piston is allowed to expand, the work done by the gas is positive, because of the force due to gas pressure and displacement act in the same direction.

**S58. Ans.(c)**

**Sol.** If a force acting on a body has a component in the opposite direction of displacement, the work done is negative, when a body slides against a rough horizontal surface, its displacement is opposite to that of the force of friction. He works done by the friction is negative.

**S59. Ans.(a)**

**Sol.** As the entire universe may be regarded as an isolated system, the total energy of the universe is constant. If one part of the universe loses energy, another part must gain an equal amount of energy.

**S60. Ans.(c)**

**Sol.**

Power, P = 10^7 kW = 10^10J/s

Time, t=1day=24×60×60s

Energy produced per day, E = Pt = 864×10^12J

$E = mc^2$

$m = E/c^2 = 9.6g.$

**S61. Ans.(d)**

**Sol.** Radioactive dating is used to measure long time intervals by finding the ratio of the number of radioactive atoms that have undergone decay to the number of atoms left undecayed. Carbon dating is used to estimate the age of fossils, uranium dating is used to estimate the age of rocks.

**S62. Ans.(d)**

**Sol.** The physical quantities which posses dimensions and have constant values are called dimensional constants. Hence Gravitational constant is a dimensional constant.

**S63. Ans.(d)**

**Sol.** The errors which occur in one direction, either positive or negative, are called systematic error. Personal errors arise due to improper setting of instruments. Hence it comes under systematic error.

**S64. Ans.(a)**

**Sol.** The thread is wound on a meter scale such that its turns are close together. Thickness of the thread coil is measure and the number of turns made by the thread is counted. Diameter is then given by dividing the thickness by a number of turns.

**S65. Ans.(c)**

**Sol.** Chemistry is the science that deals with every substance, its structure, its composition and changes. Physics is the study of the natural world, matter, energy and radiation, while biology is the science that deals with the behaviour of living things are called biological sciences.

**S66. Ans.(b)**

**Sol.** Classical physics deals with macroscopic phenomena which may be at the laboratory, terrestrial and astronomical. Quantum physics deals with microscopic phenomena at the minute scales of atoms.

**S67. Ans.(d)**

**Sol.** Gravitational force is the force of mutual attraction between two bodies by virtue of their masses. Every body attracts every other body in the universe with this force. Hence it is the universal attractive force.

**S68. Ans.(a)**

**Sol.** Sometimes, the electromagnetic contact force between two bodies may have a component acting parallel to the surface of contact. This is called friction. When bodies are placed with their smooth surfaces in contact, they provide only a small parallel component of contact of force and hence friction between them is small. This is why climbing a metallic lamp post is difficult than climbing up a tree.

**S69. Ans.(c)**

**Sol.**

Average life of an Indian = 56 years = 56×365.25×24×6
Period of heart beat = 0.8 s
Total number of heart beats in 56 years
= (56×365.25×24×60×60)/0.8 = 2.2×109 times.

**S70. Ans.(d)**

**Sol.**

F = G(m1 m2)/r^2
G = ([F][r2])/([m1 ][m2]) = (MLT^(-2) L^2)/MM
= M^(-1) L^3 T^(-2).

**S71. Ans.(a)**

**Sol.** Any of the object or material which has the highest refractive index has the minimum speed of light. The glass has the highest refractive index among other like, vacuum, water and air.

**S72. Ans.(c)**

**Sol.** The radius of curvature of plane is infinity.

**S73. Ans.(d)**

**Sol.** Electrical conductivity is a measure of the amount of electrical current under a material can carry. The most electrically conductive element is silver.

**S74. Ans.(d)**

**Sol.** The most common nuclear fuels are uranium – 235 (235U) and plutonium -239(239Pu). Thorium is more abundant in nature than uranium. Thorium can be used as a nuclear fuel through breeding to uranium-233 (U-233). Lead is not used as a nuclear fuel.

**S75. Ans.(d)**

**Sol.** The neon gas is used in discharge lamps, tubes and in fluorescent bulbs.

**S76. Ans.(b)**

**Sol.** The density of water increases with temperature but volume decreases. At 4°C, the volume of water is low and density is maximum. Conversion of Celsius in Kelvin

K = C + 273
= 4 + 273 = 277
So, the density of water is maximum at 277 K.

**S77. Ans.(d)**

**Sol.** Holography is a technique of producing a three-dimensional image of an object.

**S78. Ans.(c)**

**Sol.** Most remote controls of a television receiver send signals using Infra-red radiation.

**S79. Ans.(b)**

**Sol.** Option (b) is not correct. It is because the breaking apart of nucleus of an atom is called fission not fusion. Fission is a radioactive decay process in which the nucleus of an atom splits into smaller parts.

**S80. Ans.(b)**

**Sol.** The correct order of the following different categories of radiations are -x-rays > ultraviolet > visible light > infrared. The electromagnetic spectrum of radio waves has the lowest energy while Gama rays consist of highest energy.

**S81. Ans.(b)**

**Sol.** Manometer is an instrument that uses a column of liquid to measure pressure, commonly referred as pressure measuring instrument.

**S82. Ans.(b)**

**Sol.** Mainly there are two types of devices that are used to measure solar radiations these are: (i) Pyrheliometer (ii) Pyranometer.

**S83. Ans.(b)**

**Sol.** The shape of a drop of rain is constrained by the surface tension, which tries to give it the shape for which the surface area is minimum for the given volume. The spherical shape has the minimum surface area. That's why rain drops acquire spherical shape.

**S84. Ans.(a)**

**Sol.** Soap bubbles are large because when soap dissolved in water its surface tension is reduced. The pressure inside a soap bubble is more than atmospheric pressure.

**S85. Ans.(b)**

**Sol.** Control rod constitutes a real-time control of fission Process which is crucial for both keeping the fusion chain reaction active and preventing it from accelerating beyond control. These rods are composed of chemical elements such as boron, silver, indium and cadmium.

**S86. Ans.(c)**

**Sol.** The lens used in CD player emit ultraviolet laser beams which produce sound after reflecting through the bright surface of C.D.

**S87. Ans.(d)**

**Sol.** Television signals cannot be received beyond a certain distance because the surface of the earth is curved, due to this the signals moves further without hitting the earth's surface.

**S88. Ans.(d)**

**Sol.** Human beings have stereoscopic vision (stereopsis) means having eyes at the front of their head. The two eyes are a few centimeters apart from each other. Due to this, two eyes see the same object from two slightly different angles and send two slightly different images to the brain. The brain combines these two images to build a three-dimensional picture of the object and we can judge the depth and distance of the object more accurately.

**S89. Ans.(b)**

**Sol.** The water remains cold in an earthen pitcher because of a physical process is known as evaporation, when liquid changes to a gaseous (or vapour) state without boiling, it is known as evaporation.

**S90. Ans.(c)**

**Sol.** Velocity of sound in air is 330m/sec.

**S91. Ans.(d)**

**Sol.**

Average speed,= 2×x×y/x+y
=2×100×150/100+150
=200×150/250
=120km/hr

**S92. Ans.(b)**

**Sol.**

We can use formula of compound interest
A= P×[1+(r/100)]^n
A=2100×[1+(5/100)]^2
A=2100×[105/100]^2
A=2100×11025/10000
Hence,
Amount A= 2315.25rs.

**S93. Ans.(a)**

**Sol.**

Let the numbers be x, 2x and 3x.
The HCF in x, 2x and 3x is x because 1, 2, 3 are prime.
Hence,
x = 12; then the other numbers are 24 and 36.

**S94. Ans.(d)**

**Sol.** AC = 3 Cm.
BC = 2 Cm.
Increase in AC by 6%, then
New, AC = 3 + 6% of 3 = 3 + 0.18 = 3.18 cm.
0.18 cm increase in AC means 0.18 cm decrease in BC as already mentioned AB as the fixed point.
So, % decrease in BC,
= BC×100=0.182×100=9%

**S95. Ans.(b)**

Sol. Number of terms,=1st term - last term /common difference +1 =140−20/5+1
=120/5+1
=24+1
=25

**S96. Ans.(a)**

**Sol.** Let the number of students in the classes be 2x, 3x and 4x respectively;
Total students = 2x + 3x + 4x = 9x
According to the question, 2x+12/3x+12=8/11
or,24x+96=22x+132
or,2x=132−96
or,x=36/2=18
Hence,Original number of students, 9x=9×18=162

**S97. Ans.(a)**

**Sol.** Let the Cost price of the Chair is X.
SP = X - 25% of X
720 = 0.75X
X = 960
CP = Rs. 960
So, To gain 25%, SP would be
= 960 + 25% of 960 =Rs. 1200

**S98. Ans.(c)**

**Sol.** Ajay → (x + 4) kmph.
A _____ 60 km _____ B
Ravi → x kmph.
Let the speed of Ravi be x kmph;
Hence, Ajay's speed = (x + 4) kmph;
Distance covered by Ajay = 60 + 12 = 72 km;
Distance covered by Ravi = 60 - 12 = 48 km.
According to question,
72/x+4=48x
or,3/x+4=2x
or,3x=2x+8
or,x=8 kmph

**S99. Ans.(d)**

**Sol.** % 1 hour's work of A =100/40
= 2.5%
% 1 hour's work of B = 100/60
= 1.66%
(A + B) one hour's % work,
= (2.5 + 1.66) = 4.16%
Time to complete the work,
= 100/4.16
= 24 hours
Then, 24/8 = 3 days
They need 3 days, working 8 hours a day to complete the work.

**S100. Ans.(a)**

**Sol.** Taking all person of same nationality as one person, then we will have only three people.
These three person can be arranged themselves in 3! Ways.
8 Indians can be arranged themselves in 8! Way.
4 American can be arranged themselves in 4! Ways.
4 Englishman can be arranged themselves in 4! Ways.
Hence, required number of ways = 3! 8! 4! 4! Ways.

**S101. Ans.(a)**

**Sol.**

Sum of No.
⇒ (4+5) × 16
= 144

**S102. Ans.(d)**
**Sol.**
4 : 7
HCF = 26
Sum of no. = (4 + 7) 26
= 11 × 26
= 286

**S103. Ans.(A)**
**Sol.**
Number are 5×24 & 11×24
Sum is = 24(5+11)
=24×16
= 384

**S104. Ans.(b)**
**Sol.**
(6 + 18)28 = 17×28
= 448

**S105. Ans.(b)**
**Sol.** L C M of two natural number is divided by their H C F

**S106. Ans.(b)**
**Sol.**
A. T. Q
LCM × HCF = Product of no.
$=\frac{6\times5040}{210}=x$
$=x=144$
other no. is → 144

**S107. Ans.(d)**
**Sol.**
L.C.M. of$\{72cm, 84cm\} = 504\text{cm} = 5.04\text{m}$

**S108. Ans.(d)**
**Sol.**
HCF ×LCM = product of No.
Product of no. $=\frac{45360}{36}=1260$

**S109. Ans.(c)**
**Sol.**
9936 is the no. exactly
Divisible by 24, 36, 54
LCM (24, 36, 54)=216
9936 is the multiple of 216
So it exactly divided by 24, 36, 54

**S110. Ans.(a)**
**Sol.**
L.C.M. of 6,8, 10, 12 = 120
They will ring together in 120 sec. or 2 minutes.

**S111. Ans.(a)**
**Sol.** Let the two-digit number be
10x +y, where x > y
Here, x+y=10 ...(i)
And, 10x + y – 10y – x = 18
⇒ 9x – 9y = 18
⇒ x – y = 2 ...(ii)
On solving (i) and (ii)
x = 6 and y = 4
Number = 64

**S112. Ans.(a)**
**Sol.** Selling price $= 3600 \times \frac{90}{100}$ = Rs 3240
Cost price $= 3240 \times \frac{100}{108}$
= Rs 3000

**S113. Ans.(d)**
**Sol.**

| | Arun | Sunil |
|---|---|---|
| Efficiency | 3 | 1 |
| Days | 1 | 3 |

2 units

2 units → 60 days
1 units → 30 days
Arun can alone complete the work in 30 days
Sunil takes 3 units = 3 × 30 = 90 days

**S114. Ans.(c)**
**Sol.** $\frac{M_1D_1}{W_1}=\frac{M_2D_2}{W_2}$
$\Rightarrow \frac{72\times21}{280}=\frac{x\times18}{100}$
x= 30 workers

**S115. Ans.(a)**

**Sol.** Let length of express train = 2x

Length of other train = x

Atq,

$\frac{2x+x}{(48+42)\times\frac{5}{18}} = 12$

$\Rightarrow 3x = \frac{12\times5\times90}{18}$

x = 100m

Now, distance covered in 45 sec $= 48 \times \frac{5}{18} \times 45 =$ 600 m

length of platform = 600 – 2 × 100 = 400 m

**S116. Ans.(b)**

**Sol.** Average speed $= \frac{2ab}{a+b}$

$= \frac{2\times6\times3}{6+3} = 4$ km/hr

**S117. Ans.(c)**

**Sol.** $1080 = \frac{3000\times12\times t}{100}$

t= 3 yrs

**S118. Ans.(b)**

**Sol.** Difference $= \frac{a^2}{100}\%$

$= 0.25\%$

i.e. 0.25% → Rs 4.5

100% → Rs 1800

**S119. Ans.(b)**

**Sol.** A × 40% = B × 75%

AB=15/8

Now,

B's income = x% of A's income

⇒8=x/100×15

⇒x=800/15=160/3

**S120. Ans.(a)**

**Sol.** Let the sum be Rs.x.

Then,

C.I.=$x(1+4/100)^2-x$

=(676/625)x−x

=(51/625)x

S.I.=(x×4×2/100)

=2x/25

∴(51x/625)−(2x/25)=1

⇒x=625

**S121. Ans.(b)**

**Sol.** Speed = 600/ 5 x 60 m/sec. = 2 m/sec.

= 2 x 18/5km/hr =7.2 km/hr

**S122. Ans.(c)**

**Sol.** Speed= 60 x5/18 m/sec= 50/3 m/sec.

Length of the train = (Speed x Time).

Length of the train = 50/3x 9m = 150 m.

**S123. Ans.(b)**

**Sol.** Total number of votes = 7500

Given that 20% of Percentage votes were invalid

= Valid votes = 80%

Total valid votes = 7500×(80/100)

1st candidate got 55% of the total valid votes.

Hence the 2nd candidate should have got 45% of the total valid votes

= Valid votes that 2nd candidate got = total valid votes x (45/100)

7500×(80/100)×(45/100) = 2700

**S124. Ans.(c)**

**Sol.** S.I. for 1 year = 854 - 815 = 39.

S.I. for 3 years = 39 x 3 = 117.

Principal = 815 - 117 = 698.

**S125. Ans.(d)**

**Sol.** overall percentage change = x+y+xy/100

=> 20+20+(20×20/100) = 44%

**S126. Ans.(a)**

**Sol.** Average = total runs / no.of innings = 32

So, total = Average x no.of innings = 32 x 10 = 320.

Now increase in avg = 4runs. So, new avg = 32+4 = 36runs

Total runs = new avg x new no. of innings = 36 x 11 = 396

Runs made in the 11th inning = 396 - 320 = 76

H.C.F. of 513, 1134 and 1215 = 3 × 3 × 3 = 27.

**S127. Ans.(c)**
**Sol.** 1/[3 + (1/(3+1/(3 - 1/3)))]
= 1/[3 + 1/(3 + 1/(8/3))]
= 1/[3 + 1/(3 + 3/8)]
= 1/[3 + 8/27]
= 1/(89/27)
= 27/89

**S128. Ans.(d)**
**Sol.** Let the number be x.
Then,1/3of 1/4of x = 15
x = 15 x 12 = 180.
So, required number = 3/10 x 180 = 54.

**S129. Ans.(a)**
**Sol.** Let the ages of children be x, (x + 3), (x + 6), (x + 9) and (x + 12) years.
Then, x + (x + 3) + (x + 6) + (x + 9) + (x + 12) = 50
5x = 20
x = 4.
Age of the youngest child = x = 4 years.

**S130. Ans.(b)**
**Sol.** Time = 2 years 4 months = 2(4/12) years = 2(1/3) years.
Amount = [8000 X (1+(15/100))^2 X (1+((1/3)×15)/100)]
= [8000 × (23/20) × (23/20) × (21/20)]
= 11109. .
∴ C.I. = (11109 - 8000) = 3109.

**S131. Ans.(c)**
**Sol.**
$\sqrt{1354.24}$
= 36.8

**S132. Ans.(a)**
**Sol.**
LCM of (15, 18, 24) =360
ATQ
$\frac{360k+8}{13}$ = 368
Put k = 1,2,3,.....
K= 2 is divisible by 13
Number = 360 x 2 + 8 = 728
Sum of digits = 7 + 2 + 8 = 17

**S133. Ans.(a)**
**Sol.** 4 x 4 y 96
No. divisible by 88 is also divisible by 8 and 11 divisibility Rule for 8 = last three digit divide by 8.
Divisibility rule for 11 = sum of alternate digit are equal.
4+4+9 = x + y + 6
17 – 6 = x + y
= $\boxed{x + y = 11}$
= $\frac{y96}{8} \Rightarrow y = 2$
x = 9
x + 2y = 3

**S134. Ans.(d)**
**Sol.**
$\sqrt{1489.96}$
= 38.6

**S135. Ans.(b)**
**Sol.** LCM = 12, 16, 54
= 432
432K + 7
K=2
864 + 7 = 871
871 is the no. which leave reminder 7 when divided by 12, 16, 54. and it is also divided by 13.
Sum of digits = 8 + 7 + 1
= 16

**S136. Ans.(c)**
**Sol.**
if A no. divisible by 72 is also divisible by 9 & 8.
74 × 29y6
x = 5 y = 3
(2 × 5 + 3 × 3) = 19

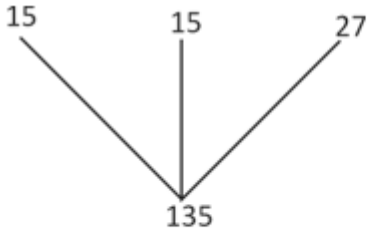
**S137. Ans.(c)**
**Sol.**
72 → 8, 9 } Number should be divisible by both 8 and 9

56×34 y 4
To be divisible by 8, y should be 2
to be divisible by 9, x should be 3
So x+y= 2+3=5

**S138. Ans.(a)**
**Sol.**

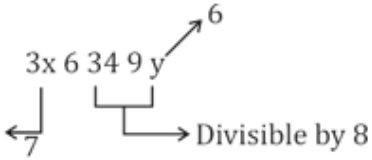
$$\frac{\sqrt{236196}}{\sqrt{100}} = \frac{486}{10}$$

**S139. Ans.(c)**
**Sol.**




135K+9 should be divisible by 11 so put k = 8
Number is = 135×8+9=1089
Reg sum is = 1+0+8+9=18

**S140. Ans.(a)**
**Sol.**
Rule of divisibility by 8
Last three digits divide completely by 8
Rule of divisibility by 11
Sum of alternate digit of no. is equal.




= 2 × 7 + 3 × 6
= 14 + 8 = 32

**S141. Ans.(d)**
**Sol.**

| T | R | U | M | P | G | A | I | N |
|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 3 | 2 | 1 | 7 | 5 | 9 | 8 |

G R U N T → 7 6 3 8 4

**S142. Ans.(d)**
**Sol.**
2×12÷32–5+4
⇒ 2–12+32×5÷4
⇒ 2–12+40
⇒ 42–12
⇒ 30

**S143. Ans.(d)**
**Sol.** Proton is discovered by Rutherford.

**S144. Ans.(b)**
**Sol.** Opposite letters pairs.

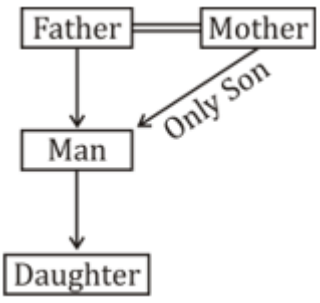
**S145. Ans.(b)**
**Sol.** Add 1.5 in each term to get next.

**S146. Ans.(c)**
**Sol.** Every pair of letters increase by +3

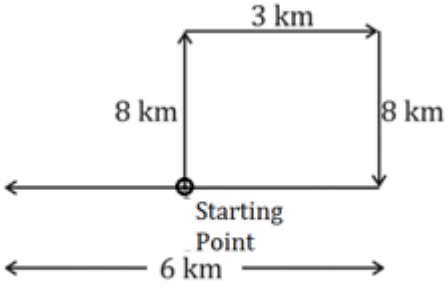
**S147. Ans.(b)**
**Sol.**
R(18) + A(1) + A(1) + M(13) = 33
R(18) + I(9) + T(20) + I(9) + K(11) + A(1) = 68
P(16) + I(9) + H(8) + U(21) = 54

**S148. Ans.(b)**
**Sol.**
18 ÷ 6 × 9 = 27
27 = 27

**S149. Ans.(b)**
**Sol.**



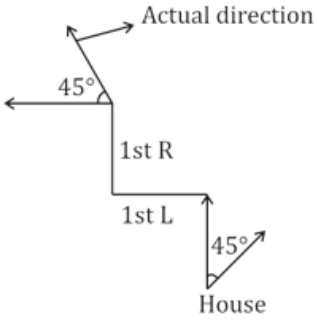

**S150. Ans.(b)**
**Sol.**




She is in 3 km west from starting point.

**S151. Ans.(d)**

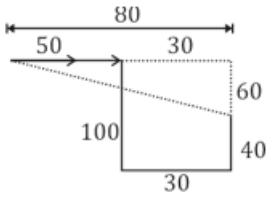
**Sol.** let us when bus started in North direction from Priya's house.




We can change direction 45° for actual direction to school then in starting also rotate 45° clockwise. The bus started in North East direction.

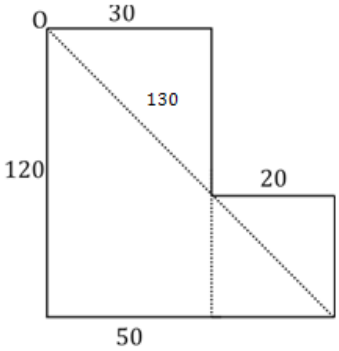
**S152. Ans.(b)**

**Sol.**



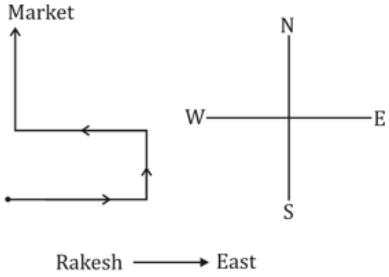

**S153. Ans.(d)**

**Sol.**



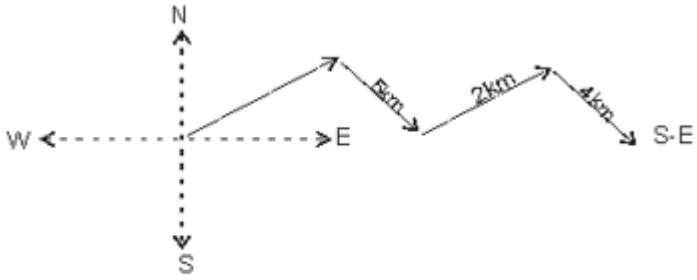

**S154. Ans.(c)**

**Sol.**




**S155. Ans.(C)**

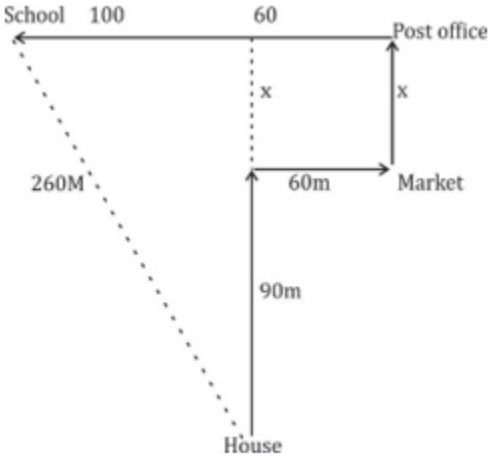
**Sol.**




Direction is N-E

**S156. Ans.(C)**

**Sol.**

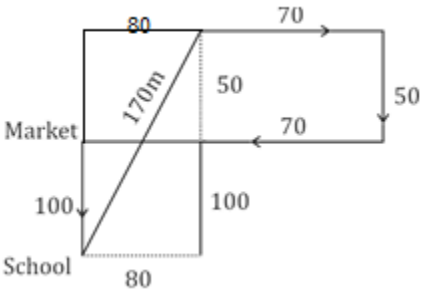



$(90+x)^2 + (100)^2 = (260)^2$

$X = 150$ m

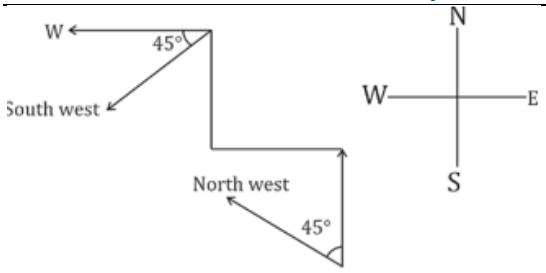
**S157. Ans.(c)**

**Sol.**



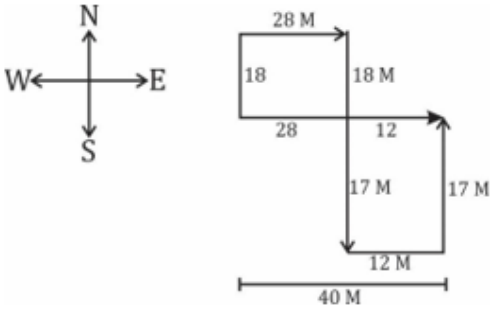

**S158. Ans.(c)**

**Sol.** Let Swati's bus start in north direction at last it reached to school in west direction and that actual direction is south west , so we rotate 45° in to anti-clock wise in both starting and ending point.




**S159. Ans.(d)**

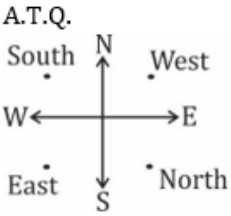
**Sol.**




40m East.

**S160. Ans.(c)**

**Sol.**




**S161. Ans.(b)**

**Sol.** $(13)^2 = 169$

$1 + 6 + 9 = 16$

$(14)^2 = 196$

$1 + 9 + 6 = 16.$

**S162. Ans.(b)**

**Sol.**

$3 \times 2 = 6$ $\downarrow +2$ 8

$3 \times 4 \rightarrow 12$ $\downarrow +4$ 16

$4 \times 2 = 8$ $\downarrow +2$ 10

$4 \times 4 = 16$ $\downarrow +4$ 20.

**S163. Ans.(b)**

**Sol.** Follow +2, +1, +2 Sequence. → ACDF

Follow –2, –1, –2 Sequence. → ZXWU

**S164. Ans.(c)**

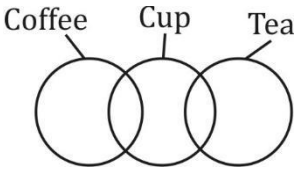
**Sol.** $30 - \frac{28}{7} - 14 \times 2$

$30 - 4 - 28$

$= -2.$

**S165. Ans.(a)**

**Sol.**




**S166. Ans.(d)**

**Sol.** Follow –1, –1, –1, Sequence.

| Q | B | O | L | B | K |
|---|---|---|---|---|---|
| ↓-1 | ↓ | ↓ | ↓ | ↓ | ↓-1 |
| P | A | N | K | A | J |

**S167. Ans.(b)**

**Sol.** Difference of 1st two and last two digit

| 2 7 | 4 3 | 3 7 | 6 4 |
|---|---|---|---|
| 5 | 1 | 4 | 2 |

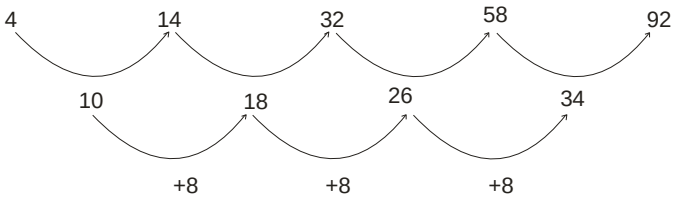
**S168. Ans.(a)**

**S169. Ans.(a)**

**Sol.** a/ab/abc/abcd/abcde

**S170. Ans.(c)**

**Sol.**




**S171. Ans.(b)**

**Sol.** $4 \div 8 \times 12 + 6 - 4 = 8$

**S172. Ans.(c)**
**Sol.** 6 × 2 – 8 ÷ 4 + 3 = 13

**S173. Ans.(c)**
**Sol.** 5 × 3 – 8 ÷ 2 + 6 = 8 ÷ 2 + 3 × 6 – 5

**S174. Ans.(d)**
**Sol.** 9 + 6 ÷ 2 – 4 × 3 = 6 ÷ 3 × 4 – 9 + 1
12 – 12 = 8 – 9 + 1
0 = 0

**S175. Ans.(b)**

**S176. Ans.(d)**
**Sol.** 18 ÷ 12 × 8 – 6 + 3 = 9

**S177. Ans.(d)**
**Sol.**
$8 \times 2 - 4 + 9 \div 3 = 9 \div 3 + 8 \times 2 - 4$
$16 - 4 + 3 = 3 + 12$
$15 = 15$

**S178. Ans.(A)**
**Sol.** ⇒ 12÷18×6-3+4
⇒ 4-3+4=5

**S179. Ans.(A)**
**Sol.**
$= 10 \div 15 \times 9 + 6 - 3$
$= 6 + 6 - 3$
$= 9$

**S180. Ans.(d)**
**Sol.** 9 + 12 × 6 ÷ 8 – 4 = 14

**S181. Ans.(b)**
**Sol.** This is a simple alternating addition and subtraction series. In the first pattern, 3 is added; in the second, 2 is subtracted.

**S182. Ans.(d)**
**Sol.** Tyre, steering wheel, and engine are all parts of a car.

**S183. Ans.(d)**
**Sol.** According to the statement, 80% of the total runs were made by spinners. So, I does not follow. Nothing about the opening batsmen is mentioned in the statement. So, II also does not follow.

**S184. Ans.(d)**
**Sol.** Since one premise is negative, the conclusion must be negative. So, neither conclusion follows.

**S185. Ans.(a)**
**Sol.** The middle letters are static, so concentrate on the first and third letters. The series involves an alphabetical order with a reversal of the letters. The first letters are in alphabetical order: F, G, H, I , J. The second and fourth segments are reversals of the first and third segments. The missing segment begins with a new letter.

**S186. Ans.(d)**
**Sol.** The boy in the photograph is the only son of the son of Suresh's mother i.e., the son of Suresh. Hence, Suresh is the father of boy.

**S187. Ans.(d)**
**Sol.** All except Veil cover the head, while veil covers the face.

**S188. Ans.(b)**
**Sol.** The seating arrangement is as follows:

P X S Z R A

Therefore, right of P is X.

**S189. Ans.(d)**
**Sol.** Acquire, Amazed, Disturb, Reprimand, Reverence

**S190. Ans.(c)**
**Sol.** Number of persons between Amrita and Mukul = 50 -(10 + 25) = 15. Since Mamta lies in middle of these 15 persons, so Mamta's position is 8th from Amrita i.e. 18th from the front.