

BPS TRE 3.0 and 4.0 Maths & Science Mock 01

Directions (1-2) Fill in the blanks with suitable articles like 'a', 'an' and 'the.'

Q1. She is ___ United States senator.

- (a) an
- (b) a
- (c) the
- (d) More than one of the above
- (e) None of the above

Q2. We need ___ light in this room

- (a) an
- (b) a
- (c) the
- (d) More than one of the above
- (e) None of the above

Q3. Which of the following is not a part of the classroom?

- (a) Chalk
- (b) Model
- (c) Tap
- (d) More than one of the above
- (e) None of the above

Q4. Which among the following is not a cereal?

- (a) barley
- (b) mustard
- (c) gram
- (d) More than one of the above
- (e) None of the above

Q5. There are five hens in the ____

- (a) coop
- (b) kennel
- (c) hive
- (d) More than one of the above
- (e) None of the above

Q6. Daughter of paternal grandmother is known as

- (a) Sister
- (b) Mother
- (c) Aunt
- (d) More than one of the above
- (e) None of the above

Q7. Sister's Father is known as

- (a) Father
- (b) Uncle
- (c) Cousin
- (d) More than one of the above
- (e) None of the above

Q8. Amir dressed ___ for the award ceremony.

- (a) up
- (b) put
- (c) down
- (d) More than one of the above
- (e) None of the above

Q9. 'अच्छा' अर्थ वैशिष्ट्य बताने वाला उपसर्ग कौन सा है?

- (a) नि
- (b) पर
- (c) सु
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q10. निम्नलिखित में से किस शब्द में 'अ' उपसर्ग नहीं जुड़ा है?

- (a) अटल
- (b) अपमान
- (c) अथाह
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q11. 'डिबिया' शब्द में मूल शब्द व प्रत्यय को अलग-अलग कीजिए-

- (a) डिब + इया
- (b) डिब्बा + इया
- (c) डिबि + या
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q12. निम्नलिखित में से प्रत्यय रहित शब्द कौन सा है?

- (a) मर्मज्ञ
- (b) वैज्ञानिक
- (c) कृपालु
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q13. निम्नलिखित में से शुद्ध वाक्य है-

- (a) गौतम ऋषि की पत्नी का नाम अहील्या था
- (b) राजीव निरपराधी है
- (c) अग्नि प्रज्वलित हो रही है
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q14. निम्नलिखित वाक्यों में से किस वाक्य में सर्वनाम का अशुद्ध प्रयोग हुआ है?

- (a) वह स्वयं यहाँ नहीं आना चाहती
- (b) आपके आग्रह पर मैं दिल्ली जा सकता हूँ
- (c) मैं तेरे को घड़ी दूँगा।
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q15. निम्नलिखित में से किस विकल्प में दिये गये शब्द परस्पर पर्यायवाची हैं?
(a) सलिल, तोय
(b) चपला, रजनी
(c) भुजंग, कुंजर
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q16. निम्नलिखित में से किस विकल्प में दिये गये शब्द परस्पर पर्यायवाची नहीं हैं?
(a) पीयूष, सुधा, सोम
(b) अरण्य, विपिन, कांतार
(c) दामिनी, यामिनी, उर्मि
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q17. निम्नलिखित में से कौन सा शब्द 'सूर्य' का पर्यायवाची नहीं है?
(a) दिवा
(b) दिवाकर
(c) दिनकर
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q18. दिए गए शब्दों के आधार पर उत्तर दीजिए-
(i) सोम
(ii) अक्षि
(iii) सुधाकर
(iv) तृण

उपर्युक्त शब्दों में 'चन्द्रमा' के पर्यायवाची कौन से हैं?

(a) (i) और (iv)
(b) (ii) और (iii)
(c) (i) और (iii)
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q19. निम्नलिखित में से किस सामासिक शब्द का विग्रह सही है?
(a) पथभ्रष्ट = पथ के लिए भ्रष्ट
(b) चतुर्भुज = चार हैं भुजाएँ जिसकी
(c) पंचमणि = बहुमूल्य मणि
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q20. निम्नलिखित में से किस सामासिक पद का विग्रह गलत है?
(a) पुरुषोत्तम = पुरुषों में जो है उत्तम
(b) चरणकमल = कमल के समान चरण
(c) गुणहीन = गुण के लिए हीन
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q21. निम्नलिखित में से कौन सा सामासिक पद सही नहीं है?
(a) ग्राम का उद्धार = ग्रामोद्धार
(b) जीवन से मुक्ति = जीवनमुक्ति
(c) धर्म से उन्मुख = धर्मविमुख
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q22. 'भौरा', 'कोयल', 'सखी' किस शब्द के अनेकार्थी हैं?
(a) अलि
(b) अंत
(c) अनंता
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q23. निम्नलिखित में से किस शब्द के सभी शब्द अशुद्ध हैं?
(a) वेपथूपा, विशिष्ट
(b) उत्कर्ष, बहिष्कार
(c) निषाद, वाष्प
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q24. निम्नलिखित में से शुद्ध वर्तनी वाले शब्द का चयन कीजिए-
(a) जीजीविषा
(b) जिजीविषा
(c) जिजिविषा
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q25. निम्नलिखित में से किस विकल्प के सभी शब्द शुद्ध हैं?
(a) अनुग्रहित, कवयित्री, ज्योत्सना
(b) अनुगृहीत, कवयित्री, ज्योत्सना
(c) अनुग्रहीत, कवयित्री, ज्योत्सना
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q26. वर्तनी की दृष्टि से कौन-सा शब्द अशुद्ध है?
(a) क्षत्रिय
(b) परिणती
(c) कनिष्ठ
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q27. इनमें से किस विकल्प में सही विलोम-युग्म है?
(a) अति-रति
(b) तिमिर-तरुण
(c) अर्पण-ग्रहण
(d) उपर्युक्त में से एक से अधिक
(e) उपर्युक्त में से कोई नहीं

Q28. 'अविर्भाव' शब्द का विलोम शब्द है-

- (a) निरामिष
- (b) तिरोभाव
- (c) यथार्थ
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q29. इनमें से कौन सा विलोम-युग्म सही नहीं है?

- (a) प्रवृत्ति – निवृत्ति
- (b) बोधगम्य – दुरूह
- (c) क्षाघा – आत्मप्रशंसा
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q30. 'अनभिज्ञ' का विलोम है-

- (a) अज्ञ
- (b) प्रज्ञ
- (c) अभिज्ञ
- (d) उपर्युक्त में से एक से अधिक
- (e) उपर्युक्त में से कोई नहीं

Q31.

If $a^2 + b^2 = 80$ and $ab = 32$, then calculate the value of

- (a) 0.337
- (b) 0.339
- (c) 0.333
- (d) More than one of above
- (e) None of above

Q32. If C = 12 and D = 15, then D is how much percent more than C?

- (a) 20
- (b) 33.33
- (c) 25
- (d) More than one of above
- (e) None of above

Q33. 20 kg of a mixture of wheat and husk contains 5% husk. How many kg more of husk must be added to make the husk content 20% in the new mixture?

- (a) 2.75
- (b) 3.75
- (c) 4.75
- (d) More than one of above
- (e) None of above

Q34. A sum of Rs 2489 is divided among A, B and C such that if Rs 12, Rs 12 and Rs 5 be diminish from the shares of A, B and C respectively, then their shares will be in the ratio of 5 : 3 : 4. What is the new share (in Rs) of C?

- (a) 750
- (b) 1060
- (c) 1475
- (d) More than one of above
- (e) None of above

Q35. A sum of Rs 15200 is divided into two parts. The simple interest on first part at the rate of 25% per annum is equal to the simple interest on second part at the rate of 13% per annum. What is the interest (in Rs) of each part?

- (a) 2500
- (b) 1300
- (c) 3250
- (d) More than one of above
- (e) None of above

Q36. Selling price of an article is Rs 27692 and loss percentage is 14%. If the selling price is Rs 37352, then what will be the profit percentage?

- (a) 13.8
- (b) 18.6
- (c) 14
- (d) More than one of above
- (e) None of above

Q37. Hiten marks his pen at Rs 9800 and after allowing discount of 20%, he still earns 12% profit. What is the cost price (in Rs) of the pen?

- (a) 7600
- (b) 7000
- (c) 6500
- (d) More than one of above
- (e) None of above

Directions (38-40) Select the related word/letters/number from the given alternatives.

Q38. Rickets : Bone :: Thalassemia : ?

- (a) Brain
- (b) Kidney
- (c) Blood
- (d) More than one of above
- (e) None of above

Q39. FG : 13 :: UV : ?

- (a) 45
- (b) 55
- (c) 21
- (d) More than one of above
- (e) None of above

Q40. 543 : 12 :: 764 : ?

- (a) 25
- (b) 17
- (c) 23
- (d) More than one of above
- (e) None of above

Directions (41-42) There are 32 students sitting in a row from left to right facing north direction in which boys and girls are in a ratio 9 : 7. Shreya is a girl and sits 6th to the right of Shreyas (Boy) who is 11th from the left end, Raghav. Who is a boy is 8th from the right end.

Q41. If Mitali is sitting exactly between Raghav and Shreya then what is he position from the right end?

- (a) 18th
- (b) 12th
- (c) 15th
- (d) More than one of above
- (e) None of above

Q42. If only boys are sitting to the left of Shreya then how many remaining boys are sitting right to her?

- (a) 5
- (b) 7
- (c) 2
- (d) More than one of above
- (e) None of above

Directions(43-43) In the following question, a statement given each followed by two Arguments I and II. You have to consider the statement to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given argument, if any, follows from the given statements.

Q43. Statement:

Should cottage industries be encouraged in rural areas?

Arguments:

I. Yes, Rural people are creative.

II. Yes, This would help to solve the problem of unemployment to some extent.

- (a) Only argument I is strong.
- (b) Only argument II is strong.
- (c) Neither I nor II is strong.
- (d) More than one of above
- (e) None of above

Q44. Which kingdom covered the modern Patna and Gaya districts of Bihar?

- (a) Kosala
- (b) Anga
- (c) Magadha
- (d) More than one of the above
- (e) None of the above

Q45. In which part of the following is the irrigation done by River in Bihar?

- (a) Terai region of Bihar
- (b) Northern Ganges Plain
- (c) Gangetic southern plains
- (d) More than one of the above
- (e) None of the above

Q46. When did the salt Satyagraha begin in Bihar?

- (a) 20th January 1930
- (b) 23rd February 1937
- (c) 25th June 1950
- (d) More than one of the above
- (e) None of the above

Q47. Which language is more prevalent in Darbhanga All India radio center in Bihar?

- (a) Hindi
- (b) Bhojpuri
- (c) Maithili
- (d) More than one of the above
- (e) None of the above

Q48. Which soil is most suitable for growing Cashew nut, coconut, coffee?

- (a) Black soil
- (b) Red Soil
- (c) Laterite soil
- (d) More than one of the above
- (e) None of the above

Q49. In April 2023, which of the following state governments launched the 'CM di Yogshala' program to create a mass movement to carve out a healthy and prosperous state?

- (a) Rajasthan
- (b) Punjab
- (c) Himachal Pradesh
- (d) More than one of the above
- (e) None of the above

Q50. Where will the first-ever Digital Science Park be established in India?

- (a) Rajasthan
- (b) Punjab
- (c) Kerala
- (d) More than one of the above
- (e) None of the above

Q51. Who was Dr. Zafrullah Chowdhury who recently passed away?

- (a) Public Health Activist
- (b) Writer
- (c) Scientist
- (d) More than one of the above
- (e) None of the above

Q52. Nandini Gupta has become Femina Miss India World 2023. Which state/UT she belongs to?

- (a) Rajasthan
- (b) Punjab
- (c) Himachal Pradesh
- (d) More than one of the above
- (e) None of the above

Q53. Article 370 granted Jammu and Kashmir the authority to internal administrative autonomy while it was governed by India as a state from 1952. In which year was Article 370 removed?

- (a) 2017
- (b) 2019
- (c) 2018
- (d) More than one of the above
- (e) None of the above

Q54. Indian National Congress split for the first time in its session at -

- (a) Allahabad
- (b) Calcutta
- (c) Surat
- (d) More than one of the above
- (e) None of the above

Q55. Who presided over the first session of the Indian National Congress?

- (a) A.O. Hume
- (b) Surendranath Banerjee
- (c) W.C. Banerjee
- (d) More than one of the above
- (e) None of the above

Q56. During whose Viceroyalty, the capital of India was shifted from Calcutta to Delhi?

- (a) Lord Canning
- (b) Lord Hardinge II
- (c) Lord Lytton
- (d) More than one of the above
- (e) None of the above

Q57. A drainage pattern where a river is joined by its tributaries approximately at right angles is _____.

- (a) Dendritic
- (b) Trellis
- (c) Rectangular
- (d) More than one of the above
- (e) None of the above

Q58. The core of the earth is also known as ____.

- (a) Lithosphere
- (b) Mesosphere
- (c) Barysphere
- (d) More than one of the above
- (e) None of the above

Q59. Marble comes under which category of rocks?

- (a) Sedimentary
- (b) Igneous
- (c) Metamorphic
- (d) More than one of the above
- (e) None of the above

Q60. Fundamental duties are mentioned in which of the following part of Indian Constitution?

- (a) Part II
- (b) Part III
- (c) Part IV A
- (d) More than one of the above
- (e) None of the above

Q61. What is the minimum age for becoming a Governor of state in India?

- (a) 30 years
- (b) 25 years
- (c) 35 years
- (d) More than one of the above
- (e) None of the above

Q62. Which of the following is a feature of federal Government?

- (a) Supremacy of Parliament
- (b) Supremacy of Judiciary
- (c) Division of powers between federal and state Government
- (d) More than one of the above
- (e) None of the above

Q63. What is the full form of FDI?

- (a) Foreign Direct Input
- (b) Foreign Direct Investment
- (c) Fiscal Direct Investment
- (d) More than one of the above
- (e) None of the above

Q64. In which situation, wages and prices chase each other at a very quick speed?

- (a) Disinflation
- (b) Reflation
- (c) Hyper-inflation
- (d) More than one of the above
- (e) None of the above

Q65. Banking comes under which of the following sector?

- (a) Primary sector
- (b) Secondary sector
- (c) Tertiary sector
- (d) More than one of the above
- (e) None of the above

Q66. The people of the Indus valley civilisation worshipped _____.

- (a) Vishnu
- (b) Pashupati
- (c) Indra
- (d) More than one of the above
- (e) None of the above

Q67. Chand Bibi was the ruler of _____.

- (a) Ahmednagar
- (b) Malwa
- (c) Golconda
- (d) More than one of the above
- (e) None of the above

Q68. Which of the following accurately describes the chemical process that leads to the formation of acid rain?

- (a) Acid rain is produced by the excessive presence of nitrogen in the atmosphere, which reacts with water and oxygen to form acidic compounds.
- (b) Acid rain is a naturally occurring phenomenon resulting from volcanic eruptions, which emit sulfur dioxide and nitrogen oxides that react with atmospheric water to form acidic compounds.
- (c) Acid rain results from the reaction of sulfur dioxide and nitrogen oxides emitted from human activities with water, oxygen, and other chemicals in the atmosphere to produce acidic compounds with a pH value below 7.
- (d) More than one of the above
- (e) None of the above

Q69. Which of the following statements is true about the greenhouse effect?

- (a) The greenhouse effect refers to the warming of the Earth's surface by the sun.
- (b) The greenhouse effect is caused by excess ozone in the Earth's atmosphere.
- (c) The greenhouse effect helps to keep the Earth's temperature stable.
- (d) More than one of the above
- (e) None of the above

Q70. Which of the following is a primary cause of water pollution?

- (a) Industrial waste
- (b) Domestic sewage
- (c) Agricultural runoff
- (d) More than one of the above
- (e) None of the above

Q71. Two numbers are, respectively, 10% and 25% more than the third number. The ratio of the two numbers is:

- (a) 22 : 25
- (b) 19 : 25
- (c) 23 : 25
- (d) More than one of the above
- (e) None of the above

Q72. A, B and C did certain investments and the ratio of their time periods is 3 : 2 : 7 respectively. Ratio of the profits of A, B and C is 4 : 3 : 14 respectively. What is the ratio of the investments of A, B and C?

- (a) 1:3:4
- (b) 7:9:11
- (c) 8:9:12
- (d) More than one of the above
- (e) None of the above

Q73. A bike is sold for ₹87,500 by allowing a discount of 44% on its marked price. The marked price (in ₹) of the bike is:

- (a) 1,56,100
- (b) 1,58,225
- (c) 1,56,250
- (d) More than one of the above
- (e) None of the above

Q74. A, B, C are three points such that AB = 9 cm, BC = 11 cm and AC = 20 cm. The number of circles passing through points A, B, C is:

- (a) 2
- (b) 0
- (c) 1
- (d) More than one of the above
- (e) None of the above

Q75. If interest be compounded half-yearly, then find the compound interest on ₹8,000 at the rate of 20% per annum for 1 year.

- (a) ₹1,675
- (b) ₹1,690
- (c) ₹1,680
- (d) More than one of the above
- (e) None of the above

Q76. A basket contains 350 eggs. If 12% of the eggs are rotten, how many eggs are good enough to be sold?

- (a) 408
- (b) 310
- (c) 308
- (d) More than one of the above
- (e) None of the above

Q77. A circle touches all four sides of a quadrilateral ABCD. If AB = 18 cm, BC = 21 cm and AD = 15 cm, then length CD is:

- (a) 16 cm
- (b) 14 cm
- (c) 18 cm
- (d) More than one of the above
- (e) None of the above

Q78. Find the value of the given expression.

$$\sqrt{8 + \sqrt{1681}}$$

- (a) 5
- (b) 6
- (c) 7
- (d) More than one of the above
- (e) None of the above

Q79. The ratio of the incomes of two employees is 7: 4, and the ratio of their expenditures is 3: 1. If each of them manages to save ₹4,800 per month, find the sum of their monthly incomes (in ₹).

- (a) 21120
- (b) 20120
- (c) 21150
- (d) More than one of the above
- (e) None of the above

Q80. If radius of a sphere is decreased by 48%, then by what percent does its surface area decrease?

- (a) 82.91%
- (b) 72.96%
- (c) 78.98%
- (d) More than one of the above
- (e) None of the above

Q81. The product of the two numbers is 1500 and their HCF is 10. The number of such possible pairs is/are:

- (a) 1
- (b) 3
- (c) 2
- (d) More than one of the above
- (e) None of the above

Q82. A man buys a machine for Rs.5,000. After one year, he sells it for Rs.6000. After two years, again he buys the same machine at Rs.8,000 and sells it for Rs.10,000. Find his overall profit percentage for both the transactions.

- (a) 20.23%
- (b) 23.08%
- (c) 18.75%
- (d) More than one of the above
- (e) None of the above

Q83. A man can row 10 km/h in still water. When the river is running at a speed of 4.5 km/h, then it takes him 2 h to row to a place and comes back to the initial point. How far is the place (in km) (rounded off to two decimal places)?

- (a) 5.50
- (b) 8.98
- (c) 7.98
- (d) More than one of the above
- (e) None of the above

Q84. Find the average of the cubes of the first five natural numbers.

- (a) 35
- (b) 40
- (c) 45
- (d) More than one of the above
- (e) None of the above

Q85. The difference of simple interest from two banks on ₹8,000 in 3 years is ₹800. If the rate of interest per annum in two banks are R1 and R2, then what is the value of R1 - R2? (Where R1 > R2)

- (a) $5\frac{1}{3}\%$
- (b) $3\frac{1}{3}\%$
- (c) $1\frac{1}{3}\%$
- (d) More than one of the above
- (e) None of the above

Q86. If $\frac{1}{x} + x = 4$, Then find $\frac{1}{x^2} + x^2$

- (a) 14
- (b) 5
- (c) 7
- (d) More than one of the above
- (e) None of the above

Q87. Find the value of given expression.

$$30 - [40 - \{56 - (25 - 13 - 12)\}]$$

- (a) 38
- (b) 22
- (c) 46
- (d) More than one of the above
- (e) None of the above

Q88. What is the compound interest on a sum of ₹25,000 after three years at a rate of 12 per cent per annum interest compounded yearly?

- (a) ₹10,123.20
- (b) ₹9,824.00
- (c) ₹10,520.00
- (d) More than one of the above
- (e) None of the above

Q89. What is the ratio of the simple interest earned on a certain amount at the rate of 21% per annum for 8 years to that earned on the same sum at the same rate for 21 years?

- (a) 8:21
- (b) 21:5
- (c) 5:21
- (d) More than one of the above
- (e) None of the above

Q90. Select the INCORRECT formula from the following options.

- (a) $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$
- (b) $\sin^2 \theta + \cos^2 \theta = 1$
- (c) $\sec^2 \theta + \cos^2 \theta = 1$
- (d) More than one of the above
- (e) None of the above

Q91. The average of 20 numbers is 32. If two numbers are 29 and 31, then what is the average of the remaining numbers (correct up to two decimals)?

- (a) 31.24
- (b) 30.22
- (c) 32.22
- (d) More than one of the above
- (e) None of the above

Q92. Find the value of the given expression.

$$\sqrt{20 - \sqrt{20 - \sqrt{20 - \sqrt{20 - \dots \infty}}}}$$

- (a) 4
- (b) 6
- (c) 5
- (d) More than one of the above
- (e) None of the above

Q93. ABCD is a cyclic quadrilateral and BC is a diameter of the related circle on which A and D also lie. $\angle BCA = 19^\circ$ and $\angle CAD = 32^\circ$. What is the measured of $\angle ACD$?

- (a) 41°
- (b) 38°
- (c) 39°
- (d) More than one of the above
- (e) None of the above

Q94. If the areas of two similar triangles are in the ratio 196 : 625, what would be the ratio of the corresponding sides?

- (a) 14:25
- (b) 13:20
- (c) 14:20
- (d) More than one of the above
- (e) None of the above

Q95. Two candidates contested an election. One of them got 64% of the votes and won by 434 votes. What was the total number of votes polled?

- (a) 1550
- (b) 1345
- (c) 1680
- (d) More than one of the above
- (e) None of the above

Q96.

P can finish a work in 18 days. When he had worked for 5 days, Q joined him. If both of them together completed the remaining work in $\frac{13}{5}$ days, then in how many days can Q alone finish $66\frac{2}{3}\%$ of the same work?

- (a) 5
- (b) 4
- (c) 3
- (d) More than one of the above
- (e) None of the above

Q97.

A person saves $33\frac{1}{3}\%$ of his income. If the saving increases by 22% and the expenditure increases by 10%, then the percentage increase in his income is:

- (a) 18%
- (b) 14%
- (c) 16%
- (d) More than one of the above
- (e) None of the above

Q98. A and B worked together and received a total of Rs.18,000 for 15 days. A's efficiency in the work was 5 times that of B's. The daily wage of A (in Rs.) was:

- (a) 800
- (b) 600
- (c) 1,000
- (d) More than one of the above
- (e) None of the above

Q99.

If $x=32.5$, $y=34.6$ and $z=30.9$, then the value of $x^3 + y^3 + z^3 - 3xyz$ is $0.98k$, where k is equal to:

- (a) 1033
- (b) 933
- (c) 1026
- (d) More than one of the above
- (e) None of the above

Q100. The driver of a car, which is travelling at a speed of 75 km/h, locates a bus 80 m ahead of him, travelling in the same direction. After 15 seconds, he finds that the bus is 40 m behind the car. What is the speed of the bus (in km/h)?

- (a) 44.2
- (b) 42.5
- (c) 46.2
- (d) More than one of the above
- (e) None of the above

Q101. A sum of money at simple interest amounts to Rs.6,000 in 4 years and to Rs.6,750 in 7 years at the same rate per cent of interest. The sum (in Rs.) is:

- (a) 5,100
- (b) 4,800
- (c) 5,000
- (d) More than one of the above
- (e) None of the above

Q102.

If 91% of A is 39% of B, and B is $x\%$ of A, then the value of x is:

- (a) $\frac{200}{3}$
- (b) $\frac{700}{3}$
- (c) $\frac{400}{3}$
- (d) More than one of the above
- (e) None of the above

Q103.

If $x^2 - 3x + 1 = 0$, then the value of $\frac{(x^4 + \frac{1}{x^2})}{(x^2 + 5x + 1)}$ is :

- (a) $\frac{9}{4}$
- (b) $\frac{27}{8}$
- (c) $\frac{5}{8}$
- (d) More than one of the above
- (e) None of the above

Q104. An athlete runs 8 times around a circular field of radius 7 m in 3 minutes 40 seconds. His speed (in km/h) is : (take $\pi = \frac{22}{7}$)

- (a) $\frac{72}{25}$
- (b) $\frac{118}{25}$
- (c) $\frac{144}{25}$
- (d) More than one of the above
- (e) None of the above

Q105. In a square ABCD, diagonals AC and BD intersect at O. The angle bisector of $\angle CAB$ meet BD and BC at F and G, respectively. OF : CG is equal to:

- (a) 1 : 2
- (b) 1 : 3
- (c) $1 : \sqrt{2}$
- (d) More than one of the above
- (e) None of the above

Q106. Mixture A contains chocolate and milk in the ratio 4 : 3 and mixture B contains chocolate and milk in the ratio 5 : 2. A and B are taken in the ratio 5 : 6 and mixed to form a new mixture. The percentage of chocolate in the new mixture is closest to:

- (a) 35%
- (b) 69%
- (c) 65%
- (d) More than one of the above
- (e) None of the above

Q107. The value of $\frac{3}{70} + \frac{1}{42} + \frac{1}{66} + \frac{3}{286} + \frac{1}{130} + \frac{1}{170}$ is:

- (a) $\frac{7}{85}$
- (b) $\frac{11}{85}$
- (c) $\frac{9}{85}$
- (d) More than one of the above
- (e) None of the above

Q108.

If $\frac{\sqrt{26-7\sqrt{3}}}{\sqrt{14+5\sqrt{3}}} = \frac{b+a\sqrt{3}}{11}$, $b > 0$, then what is the value of $\sqrt{(b-a)}$?

- (a) 5
- (b) 25
- (c) 12
- (d) More than one of the above
- (e) None of the above

Q109.

If $27x^3 - 64y^3 = (Ax + By)(Cx^2 - Dy^2 + 12xy)$, then the value of $4A+B+3C+2D$ is:

- (a) 5
- (b) 3
- (c) -3
- (d) More than one of the above
- (e) None of the above

Q110. If a nine-digit number $789x6378y$ is divisible by 72, then the value of xy is:

- (a) 10
- (b) 12
- (c) 8
- (d) More than one of the above
- (e) None of the above

Q111. Consider the following statements about veins

1. Veins carry CO_2 rich blood from all parts of the body back to the heart
2. Veins have thick walls
3. Veins have valves which allow blood to flow only towards the heart

The correct statement(s) is/are

- (a) Only A
- (b) Only C
- (c) A and B
- (d) More than One of the above
- (e) None of the above

Q112. Select correct statement from the following:

- (a) Zinc is more reactive than aluminium.
- (b) Copper can displace iron from ferrous sulphate solution.
- (c) Iron can displace from copper sulphate solution but cannot displace aluminium from aluminium sulphate
- (d) More than one of the above
- (e) None of the above

Q113. Out of eight planets six planets of the solar system rotate on their axis from west to east. The other two which rotate on their axes from east to west are

- (a) Mercury, Uranus
- (b) Mercury, Neptune
- (c) Venus, Uranus
- (d) More than one of the above
- (e) None of the above

Q114. Which of the following process will be hampered in the mouth cavity of a person whose saliva is lacking salivary amylase?

- (a) Conversion of fats into fatty acids
- (b) Conversion of proteins into amino acids
- (c) Conversion of starch into sugars
- (d) More than one of the above
- (e) None of the above

Q115. The process of dispersion of light can be seen when light

- A. passes through soap bubbles
- B. falls on the surface of a CD
- C. passes through rain drops
- D. gets focused on the surface of shining marble

- (a) A, B, C
- (b) B, C, D
- (c) A, C, D
- (d) More than one of the above
- (e) None of the above

Q116. Select the correct statement from the following

- (a) Static friction is smaller than the sliding friction.
- (b) Rolling friction is more than the sliding friction.
- (c) Sliding friction is more than the rolling friction but less than the static friction.
- (d) More than one of the above
- (e) None of the above

Q117. A student wants to change a feeble sound to a loud sound. For this he should increase the

- (a) amplitude of sound
- (b) frequency of sound
- (c) speed of sound
- (d) More than one of the above
- (e) None of the above

Q118. Which of the following represents a set of cell organelles found in animal cell?

- (a) Cell membrane, cytoplasm, nucleus, vacuole
- (b) Cell membrane, cell wall, cytoplasm, nucleus
- (c) Cell membrane, chloroplast, cytoplasm, nucleus
- (d) More than one of the above
- (e) None of the above

Q119. Consider the following statements about ozone:

A. Ozone is formed at higher level of atmosphere by the action of UV rays on oxygen

B. It protects us from the harmful UV radiations which come from the sun.

C. Ozone is not different from oxygen

D. Breaking down Ozone into oxygen is not considered a chemical change

- (a) Only A
- (b) Only B
- (c) Only C
- (d) More than one of the above
- (e) None of the above

Q120. Consider the following statements about biodiversity:

A. It is found in abundance in dense forests

B. It refers to only the fauna found in an area

C. It refers to the total number of individual species found in a given area

D. It refers to the variety of living organisms (various species of flora and fauna) present in a given area.

The correct statements are

- (a) Only A
- (b) Only D
- (c) Only C
- (d) More than one of the above
- (e) None of the above

Q121. Which of the following represents group of three petrochemicals?

- (a) Diesel, Kerosene and Rayon
- (b) Petrol, Diesel and Caustic soda
- (c) Lubricating oil, Polyester, Bitumen
- (d) More than one of the above
- (e) None of the above

Q122. You have a brick (length b and height h). If you keep it on a table such that different faces touch the surface each time, then in the three different cases, the brick will exert

- (a) same thrust and same pressure
- (b) same thrust and different pressure
- (c) different thrust but different pressure
- (d) More than one of the above
- (e) None of the above

Q123. From the following table choose the group in which part of the stamen and parts of the pistil of a flower are correctly matched:

No	Part of the Stamen	Parts of the Pistil
1	Anther, Filament, Sepal	Ovary, Stigma, Petal
2	Anther, Style, Stigma	Ovary, Filament, Stigma
3	Anther, Filament	Ovary, Style, Stigma
4	Anther, Filament	Ovary, Petal, Style

- (a) 1
- (b) 2
- (c) 3
- (d) More than one of the above
- (e) None of the above

Q124. The inner lining of stomach is protected from hydrochloric acid secreted by gastric glands by

- (a) pancreatic juice
- (b) bile juice
- (c) mucous
- (d) More than one of the above
- (e) None of the above

Q125. After digging a grass plant, a student on observing its roots and leaves, notes down his observations as

- (a) Fibrous roots and reticulate venation
- (b) Fibrous roots and parallel venation
- (c) Tap roots and parallel venation
- (d) More than one of the above
- (e) None of the above

Q126. Select the correct statement from the following

- (a) Both Sodium and phosphorous are stored in kerosene
- (b) Both Sodium and phosphorous are stored in water
- (c) Sodium is stored in kerosene whereas phosphorous is stored in water
- (d) More than one of the above
- (e) None of the above

Q127. A copper vessel when exposed to humid air for a long time acquires a dull green coating on its outer surface. The green material is

- (a) copper carbonate+ copper hydroxide
- (b) copper carbonate + copper sulphate
- (c) copper hydroxide + copper sulphate
- (d) More than one of the above
- (e) None of the above

Q128. The activities which are practiced to enrich or replenish the soil with nutrients are

- (a) crop rotation, deep ploughing, adding manures
- (b) crop rotation, adding manures, adding fertilizers
- (c) adding manures, adding fertilizers, irrigation
- (d) More than one of the above
- (e) None of the above

Q129. Which of the following is a set of Rabi crops?

- (a) Gram, Mustard, Pea, Wheat
- (b) Gram, Mustard, Paddy, Soybean
- (c) Groundnut, Mustard, Pea, Wheat
- (d) More than one of the above
- (e) None of the above

Q130. A car covers first half of its journey with a speed v_1 and the next half with a speed v_2 . The average speed of the car to completes its whole journey is

- (a) $\frac{v_1 + v_2}{2}$
- (b) $\sqrt{v_1 v_2}$
- (c) $\frac{2v_1 v_2}{v_1 + v_2}$
- (d) More than one of the above
- (e) None of the above

Q131. Sanjana has three magnet, A, B and C, whose poles are marked as A1, A2, B1, B2 and C1, C2 respectively. She noted down the following observations on bringing the magnets closer

A1 repels B1

A1 repels C2

If C1 is north pole, then which of the following statements is true.

- (a) B2 is north pole and A1 is south pole
- (b) B2 is north pole and A2 is south pole
- (c) Both B1 and A1 are north poles
- (d) More than one of the above
- (e) None of the above

Q132. The speed-time graph of an object is a straight line. Which of the following statements can be concluded?

A- The motion of the object is a uniform motion

B- The object is at rest

C- The motion of the object is a non uniform motion.

- (a) A or B
- (b) B or C
- (c) A or C
- (d) More than one of the above
- (e) None of the above

Q133. Which properties of solid particles is used for the process of sedimentation?

- (a) Light and soluble in water.
- (b) Light and insoluble in water.
- (c) Heavy and insoluble in water.
- (d) More than one of the above
- (e) None of the above

Q134. The following observation were noted by Antara on burning various fibres on a candle flame

X - burns with bright light and greyish black ash is left

Y - burns by curling and produces dark crisp ash

Z - melts on burning

X, Y, Z could be respectively

- (a) Cotton, nylon, wool
- (b) Jute, wool, rayon
- (c) Silk, denim, nylon
- (d) More than one of the above
- (e) None of the above

Q135. In which of the following simple series circuits, will the bulb/bulbs glow brighter assuming that cells and bulbs are identical in each case.

- (a) One bulb and one cell
- (b) One bulb and two cells
- (c) Two bulbs and one cell
- (d) More than one of the above
- (e) None of the above

Q136. A is required for proper functioning of thyroid gland and deficiency of it caused B. It is an endemic deficiency disease as it is usually suffered by people living in C regions. Deficiency of "A" also causes D in children. A, B, C, D respectively are

- (a) Calcium, rickets, coastal, bone malformation
- (b) Phosphorus, goiter, coastal, bone malformation
- (c) Iron, goiter, hilly, mental retardation
- (d) More than one of the above
- (e) None of the above

Q137. Read the following statements and choose correct response.

Assertion (A)- A solar eclipse occurs when the moon comes in between the sun and the Earth

Reason (R1)- Shadow of the Earth falls on moon, blocking the sunlight

Reason (R2)- Moon casts a shadow on parts of the Earth, blocking the sunlight

- (a) A is correct and R1 is correct explanation of A.
- (b) A is correct and R2 is correct explanation of A.
- (c) A is correct and neither R1 nor R2 is correct explanation for A.
- (d) More than one of the above
- (e) None of the above

Q138. Which of the following statements is not true about shadow formation?

- (a) A yellow object casts a black shadow.
- (b) Shadow can be formed by opaque objects only.
- (c) Length of shadow is always same as length of object.
- (d) More than one of the above
- (e) None of the above

Q139. Read the following statements and choose correct option

Assertion (A)- A stomata are usually present on surface of leaves and succulent stem in desert plants.

Reason (R)- The position of stomata in leaves affects the rate of transpiration in plants.

- (a) Both A and R are correct and R is correct explanation for A
- (b) Both A and R are correct but R not is correct explanation for A
- (c) R is correct but A is incorrect
- (d) More than one of the above
- (e) None of the above

Q140. A female reproduction organ of a plant is called as X. It consists of 3 parts of which Y is mainly the receptive surface for pollen grains. Fertilization takes place in the Z. X, Y, Z are

- (a) X – pistil, Y – stigma, Z - ovules
- (b) X – pistil, Y – style, Z - ovules
- (c) X – stamen, Y – filament, Z - ovary
- (d) More than one of the above
- (e) None of the above

Q141. Read the following statements and choose correct option

Assertion A. A drum produces a low-pitched sound while a piano produces a high-pitched sound.

Reasoning R. The amplitude of vibrations of the vibrating object determines the loudness of sound.

- (a) A is true and R provides the correct explanation for it.
- (b) Both A and R true but R is not the correct explanation.
- (c) A is true but R is false
- (d) More than one of the above
- (e) None of the above

Q142. Which of these phenomena cannot be explained on the basis of Gravitation force?

- (a) Motion of planets around the sun
- (b) Occurrence of tides
- (c) Occurrence of eclipses
- (d) More than one of the above
- (e) None of the above

Q143. Four balls are thrown with same force on four different types of surface. One which surface type would the balls travel the maximum distance?

- (a) Skating rink.
- (b) Sea beach.
- (c) Cemented road.
- (d) More than one of the above
- (e) None of the above

Q144. An iron blade is dropped into a bluish solution. After about half an hour, the color of the solution is found to have changed to green and a brown colored deposit is observed on the nail. Based on this information which of the following can you conclude?

- (a) The green colored solution is copper sulphate.
- (b) The blue colored solution is Iron sulphate.
- (c) The brown deposit on the blade is copper.
- (d) More than one of the above
- (e) None of the above

Q145. Naphthalene balls that are used to repel moths and other insects are obtained from:

- (a) Coal tar
- (b) Coke
- (c) Eucalyptus trees
- (d) More than one of the above
- (e) None of the above

Q146. An element 'A' reacts with water to form a solution. This solution turns phenolphthalein indicator pink.

Which of the following could be element 'A'?

- (a) Carbon
- (b) Silicon
- (c) Sodium
- (d) More than one of the above
- (e) None of the above

Q147. Read the following statements and choose the correct option:

Assertion A. Stifling is applied to prevent the emergence of silk moth and preserve the silk for long period of time, in the form of cocoon.

Reason R. Ahimsa silk is the silk gathered after silk moth emerges from the cocoon

- (a) Both A and R true and R is the correct explanation of A
- (b) Both A and R are true and R is not the correct explanation of A
- (c) A is true but R is false
- (d) More than one of the above
- (e) None of the above

Q148. When an acid reacts with a base, which of the following is/are produced?

- (a) Only salt
- (b) Only water
- (c) Salt, water and heat
- (d) More than one of the above
- (e) None of the above

Q149. To which of the following, can the wilting of a plant be attributed to?

- (a) Excessive transpiration
- (b) Excessive Photosynthesis
- (c) Excessive absorption of water
- (d) More than one of the above
- (e) None of the above

Q150. **X** glands are present in pairs and releases hormones which regulates blood pressure. It receives orders to secrete hormones from **Y** gland. **Y** also secrete **Z** hormone. What could be X, Y and Z respectively

- (a) Thuroid, Pituitary, adrenaline
- (b) Adrenal, Pituitary, growth hormone
- (c) Pamcreas, Thyroid, insulin
- (d) More than one of the above
- (e) None of the above

Solutions

S1. Ans.(a)

Sol. Before a vowel sound, 'an' is used to ensure smooth pronunciation. "United" starts with a vowel sound, making "an" the appropriate article.

S2. Ans.(b)

Sol. "Light" begins with a consonant sound, so "a" is used as the indefinite article to introduce it in the sentence.

S3. Ans.(c)

Sol. A tap is generally not found in a classroom setting, which typically includes items like chalk and models but not plumbing fixtures.

S4. Ans.(d)

Sol. Both mustard and gram are not cereals. Barley is a cereal grain, whereas mustard (a condiment crop) and gram (a legume) do not belong to the cereal category. Cereals are grasses cultivated for the grains they produce, which are used for food, feed, and fodder. Mustard is grown for its seeds used to make mustard condiment and oil, and gram (chickpea) is a legume known for its edible seeds.

S5. Ans.(a)

Sol. Hens are kept in a coop, which is a cage or pen for poultry. The other options do not correctly house hens.

S6. Ans.(c)

Sol. The daughter of your paternal grandmother (your father's mother) is your father's sister, making her your aunt.

S7. Ans.(a)

Sol. Your sister's father is also your father, as you share the same parent.

S8. Ans.(a)

Sol. "Dressed up" means to wear formal or elaborate clothes, which is suitable for an award ceremony.

S9. Ans.(c)

Sol. 'अच्छा' अर्थ वैशिष्ट्य बताने वाला उपसर्ग 'सु' है, इसके प्रयोग से बनने वाले शब्द हैं- सुडौल, सुजान, सुशील, सुलोचना, सुयोग, सुपूत, सुबुद्धि, सुपात्र, सुगम आदि।

S10. Ans.(b)

Sol. अटल, अथाह और अछूता शब्दों में 'अ' उपसर्ग है, लेकिन 'अपमान' शब्द में 'अप' उपसर्ग है, जिसका अर्थ है बुरा, हीन।

S11. Ans.(b)

Sol. मूल शब्द 'डिब्बा' है तथा प्रत्यय 'इया' है इसका अर्थ है 'बाला', यह लघुत्व बोधक स्त्री प्रत्यय है।

S12. Ans.(a)

Sol. 'मर्मज्ञ' प्रत्यय रहित शब्द है। 'वैज्ञानिक' शब्द में 'इक' प्रत्यय है। 'कृपालु' शब्द में 'आलू' प्रत्यय है।

S13. Ans.(c)

Sol. 'अग्नि प्रज्वलित हो रही है' सही वाक्य है।

S14. Ans.(c)

Sol. 'मैं तेरे को घड़ी दूँगा' इस वाक्य में 'तेरे को' का प्रयोग गलत है इसके स्थान पर 'तुझे' या 'तुम्हें' का प्रयोग उचित है।

S15. Ans.(a)

Sol. सलिल और तोय, पानी के पर्यायवाची हैं।

S16. Ans.(c)

Sol. पीयूष, सुधा और सोम, 'अमृत' के पर्यायवाची हैं। अरण्य, विपिन और कांतार, 'वन' के पर्यायवाची हैं। दामिनी का पर्यायवाची शब्द विद्युत है, यामिनी का पर्यायवाची शब्द 'रात्रि' है, उर्मि का पर्यायवाची शब्द लहर है।

S17. Ans.(a)

Sol. दिवाकर, दिनकर 'सूर्य' के पर्यायवाची हैं। दिवा, दिन का पर्यायवाची है।

S18. Ans.(c)

Sol. सोम और सुधाकर चन्द्रमा के पर्यायवाची हैं। 'अक्षि' आँख का पर्यायवाची है तथा 'तृण' घास का पर्यायवाची है।

S19. Ans.(b)

Sol. 'चतुर्भुज = चार हैं भुजाएँ जिसकी', इसमें सामासिक शब्द का विग्रह सही है।

S20. Ans.(c)

Sol. गुणहीन = गुण के लिए हीन, यह गलत है।
गुणहीन = गुण से हीन, यह सही विग्रह है।

S21. Ans.(c)

Sol. धर्मविमुख = धर्म से विमुख, यह सही विग्रह है।

S22. Ans.(a)

Sol. 'भौरा', 'कोयल' और 'सखी', अलि शब्द के अनेकार्थी हैं।

S23. Ans.(a)

Sol. सही वर्तनी है -वेशभूषा, विशिष्ट।

S24. Ans.(b)

Sol. सही वर्तनी है - जिजीविषा।

S25. Ans.(b)

Sol. शब्दों की सही वर्तनी है - अनुगृहीत, कवयित्री, ज्योत्स्ना।

S26. Ans.(b)

Sol. 'परिणती' की शुद्ध वर्तनी 'परिणति' है।

S27. Ans.(c)

Sol. सही विलोम-युग्म 'अर्पण-ग्रहण' है।

S28. Ans.(b)

Sol. 'आविर्भाव' शब्द का विलोम शब्द 'तिरोभाव' है।

S29. Ans.(c)

Sol. क्षाधा का अर्थ 'आत्मप्रशंसा' है, इसलिए इसका विलोम शब्द 'निंदा' है।

S30. Ans.(c)

Sol. अनभिज्ञ का अर्थ - जो किसी बात को जानता न हो। अभिज्ञ का अर्थ - जानकार, ज्ञाता।

S31. Ans.(c)

Sol.

$$(a + b)^2 = a^2 + b^2 + 2ab$$

$$(a + b)^2 = 80 + 2 \times 32$$

$$a + b = \sqrt{144} = 12$$

$$(a - b)^2 = a^2 + b^2 - 2ab$$

$$(a - b)^2 = 80 - 2 \times 32$$

$$a - b = 4$$

$$\text{Required} = \frac{a-b}{a+b} = \frac{4}{12} = \frac{1}{3} = 0.333$$

S32. Ans.(c)

Sol.

$$\text{Required percentage} = \frac{15-12}{12} \times 100 = 25\%$$

S33. Ans.(b)

Sol.

	Wheat	husk	Wheat	husk	
Old ratio	95%	5%	19×4	1×4) 15unit
New ratio	80%	20%	4×19	1×19	

∴ Quality of wheat is equal in both type of mixture.

So, total first mixture = 76 + 4 = 80 unit

& required to add husk = 15 unit

$$\text{Required quantity} = \frac{15}{80} \times 20 = 3.75 \text{ kg}$$

S34. Ans.(e)

Sol.

Let share of A, B & C after diminish = 5x, 3x & 4x

Sum of their share before diminish

$$\Rightarrow 5x + 12 + 3x + 12 + 4x + 5 = 2489$$

$$\Rightarrow 12x = 2460$$

$$x = 205$$

Required new share of c = 4x

$$= 205 \times 4 = 820$$

S35. Ans.(b)

Sol.

Atq,

$$A \times \frac{25}{100} = B \times \frac{13}{100}$$

$$\frac{A}{B} = \frac{13}{25}$$

$$\text{Part A} = \frac{15200 \times 13}{38} = 5200$$

$$\text{Required interest} = \frac{5200 \times 25 \times 1}{100} = 1300$$

S36. Ans.(e)

Sol.

Given selling price = 27692

Atq,

$$\text{Cost price} = \frac{27692}{(100-14)} \times 100 = 32200$$

Required profit percent

$$= \frac{37352 - 32200}{32200} \times 100 = 16\%$$

S37. Ans.(b)

Sol.

$$\text{Selling price} = \frac{9800 \times 80}{100} = 7840$$

$$\text{Required cost price} = \frac{7840 \times 100}{112} = 7000$$

S38. Ans.(c)

Sol.

Rickets is a Bone related disease

Similarly, Thalassaemia is a blood related

S39. Ans.(e)

Sol.

F = 6 [position of F in the alphabet series]

G = 7 [position of G in the alphabet series]

F + G = 13

U = 21 [position of U in the alphabet series]

V = 22 [position of V in the alphabet series]

U + G = 21 + 22 = 43

S40. Ans.(b)

Sol.

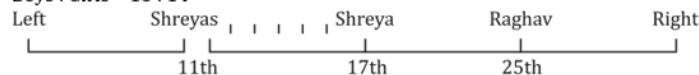
$$5 + 4 + 3 = 12$$

$$\text{Similarly, } 7 + 6 + 4 = 17$$

S41. Ans.(b)

Sol.

Boys : Girls = 18 : 14



Mithali is sitting exactly in between Raghav and Shreyas.

Mid point from 17th to 25th → 21st from the Right end Mithali is at

$$21 + x - 1 = 32$$

$$x = 12^{\text{th}} \text{ position}$$

S42. Ans.(c)

Sol.

Left of Shreya = 16 boys

Right of Shreya = 2 boys

S43. Ans.(b)

Sol. Clearly, cottage industries need to be promoted to create more job opportunities for rural people in the villages themselves. The reason that rural people are creative is vague. So, only argument II holds.

S44. Ans.(c)

Sol. The kingdom that covered the modern Patna and Gaya districts of Bihar was Magadha. Therefore, the correct option is (c) Magadha.

S45. Ans.(b)

Sol. In Bihar, the irrigation is primarily done by the rivers in the Northern Ganges Plain. The Northern Ganges Plain, also known as the Indo-Gangetic Plain, is a fertile region in Bihar and other states of northern India. It is traversed by several major rivers, including the Ganges, which provide water for irrigation purposes.

S46. Ans.(a)

Sol. The correct answer is (a) 20th January 1930. The Salt Satyagraha, also known as the Dandi March or Salt March, was a significant event during India's independence movement led by Mahatma Gandhi. It began on 12th March 1930, with Gandhi's historic Dandi March to protest against the British salt monopoly. However, it is important to note that the Salt Satyagraha was a nationwide movement, and its impact was not limited to Bihar alone.

S47. Ans.(c)

Sol. The language more prevalent in the Darbhanga All India Radio center in Bihar is (c) Maithili. Maithili is a regional language spoken mainly in the Mithila region of Bihar and parts of Nepal. It has a significant presence in Darbhanga and surrounding areas. All India Radio (AIR) stations often broadcast programs in regional languages to cater to the local audience, and since Maithili is widely spoken in the region, it is likely to be prevalent in the Darbhanga center

S48. Ans.(c)

Sol. Laterite soil are red in colour with high content of iron oxides but are poor in nitrogen and lime. This is found in Tamilnadu, Odisha. It is suitable for crops like tea, coffee, rubber, cinchona etc.

S49. Ans.(b)

Sol. Chief Minister of Punjab Bhagwant Mann along with Delhi CM Arvind Kejriwal launched the "CM di Yogshala" campaign.

- Residents will be provided with yoga and meditation facilities.
- Governor of Punjab - Banwarilal Purohit

S50. Ans.(c)

Sol. Prime Minister Narendra Modi will lay the foundation stone for India's first Digital Science Park coming up at the Technocity campus in Thiruvananthapuram, Kerala on April 25.

- ₹1,500 crore Digital Science Park project.
- The project is to be completed in two years.

S51. Ans.(a)

Sol. Dr. Zafrullah Chowdhury, a renowned public health activist and veteran fighter of the Liberation War, passed away in Dhaka, Bangladesh at the age of 81.

- He was also a vascular surgeon and was a trailblazer in public health.
- In 1972, he established the Gonoshasthaya Kendra with the goal of providing low-cost and high-quality medical care to disadvantaged communities.
- He was the recipient of the Ramon Magsaysay Award in the category of Community Leadership in 1985, as well as the Right Livelihood Prize in 1992.
- He earned the moniker of "doctor of the poor"
- During the liberation war of Bangladesh in 1971, he halted his medical studies in the UK and joined the liberation movement.
- The highest civilian award in Bangladesh, the Independence Award, was conferred upon Dr. Zafrullah Chowdhury in 1977.

S52. Ans.(a)

Sol. Rajasthan's Nandini Gupta has been crowned Femina Miss India World 2023.

- Delhi's Shreya Poonja became the first runner-up.
- Manipur's Thounaojam Strela Luwang was crowned the 2nd runner-up.

S53. Ans.(b)

Sol. Article 370 was removed on 31st October 2019.

Details:

- Article 370 granted Jammu and Kashmir the authority to internal administrative autonomy while it was governed by India as a state from 1952 until 31 October 2019.
- Jammu and Kashmir, which is part of the wider area of Kashmir and is situated in the northern section of the Indian subcontinent and has been the subject of a conflict between India, Pakistan, and China since 1947, was granted special status under Article 370 of the Indian constitution.
- Article 370 granted Jammu and Kashmir the authority to have a separate constitution, a state flag, and internal administrative autonomy while it was governed by India as a state from 1952 until 31 October 2019.

S54. Ans.(c)

Sol. The Indian National Congress(INC) which was established in 1885 was divided into two groups(in the year 1907) mainly by extremists and moderates at the Surat Session of the Congress.

Information Booster

- Surat Split (1907) refers to the splitting of the Congress party into 'Moderates' and 'Extremists' after a violent clash at the session.
- The extremists were led by Lokmanya Tilak, Lajpat Rai, V. O. Chidambaram Pillai, and Sri Aurobindo and the moderates were led by Gopal Krishna Gokhale, Pherozeshah Mehta, and Surendranath Banerjee.

S55. Ans.(c)

Sol. Womesh Chandra Banerjee presided over the first session of the Indian National Congress in 1885.

- The first meeting of the INC was proposed at Poona, but because of an outbreak of plague in Poona, the venue was shifted to Bombay.
- In the first session that was held in Bombay, at the 'Gokuldas Tejpal Sanskrit Pathshala' only 72 delegates had participated.
- The meeting was attended by 72 English-educated people that included advocates, traders, and zamindars.
- It was the first modern nationalist movement to emerge in the British Empire in Asia and Africa.
- The second meeting of the Indian National Congress was presided by Dadabhai Naoroji in Kolkata in 1886.

S56. Ans.(b)

Sol. The Capital of India was shifted from Calcutta to Delhi during Lord Hardinge II tenure in 1911. George V, the King of England visited India to attend the Delhi durbar in 1911.

Information Booster

- During the Delhi Durbar on 12 December 1911, George V, the then ruling Emperor of India, along with Queen Mary, announced that the capital of India would be shifted from Kolkata to Delhi.
- Lord Hardinge II (1910-1916) In his reign, the capital of British India was shifted from Calcutta to Delhi in 1911, the actual transfer of capital in 1912.

S57. Ans.(b)

Sol. A drainage pattern where a river is joined by its tributaries approximately at right angles is Trellis Pattern.

S58. Ans.(c)

Sol. The core of the earth is also known as Barysphere.

- Barysphere is the interior of the Earth beneath the lithosphere, including both the mantle and the core. However, it is sometimes used to refer only to the core or only to the mantle.

S59. Ans.(c)

Sol. Marble is a metamorphic rock composed of recrystallized carbonate minerals, most commonly calcite or dolomite. Marble may be foliated.

S60. Ans.(c)

Sol. The Fundamental Duties are defined as the moral obligations of all citizens to help promote a spirit of patriotism and to uphold the unity of India. These duties, set out in Part IV-A of the Constitution, concern individuals and the nation. Like the Directive Principles, they are not enforceable by the law.

S61. Ans.(c)

Sol. According to Article 58(1)(b) the minimum age for becoming Governor of State in India is 35 years.

- The governor must be a citizen of India.
- He should not be a member of either house of the parliament or house of the state legislature.
- The governor shall not hold any office of profit.
- The governor has the power to summon, prorogue the state legislature.
- He can also dissolve the legislative assembly when it loses confidence.

S62. Ans.(c)

Sol. The main federal features of Constitution are- Written Constitution, Supremacy of the Constitution, Rigid Constitution, Division of Powers between federal and state government, Independent Judiciary, Bicameral Legislature and Dual Government Polity.

S63. Ans.(b)

Sol. FDI is an investment in a country by a company located in another country. The investment is called direct because the investor, is a foreign entity try to control or manage things of another country.

S64. Ans.(c)

Sol. Hyperinflation is an extremely rapid period of inflation, usually caused by a rapid increase in the money supply.

S65. Ans.(c)

Sol. Service sector also known as tertiary sector includes all branches of human activity whose core is to provide services. Banking, transportation, financial service etc come in the category of service sector.

S66. Ans.(b)

Sol. The people of Indus Valley civilisation worshipped god Pashupati.

- The seals of the Harappan Civilization were mainly square-shaped and made from a stone called steatite from these seals we get an idea of the religious life of the Indus Valley Civilisation.
- The chief male deity was Pashupati, (proto-Siva) represented in seals as sitting in a yogic posture with three faces and two horns.
- He is surrounded by four animals (elephant, tiger, rhino, and buffalo) and two deer appear on his feet.
- The Indus Valley Civilization was spread from present-day North-East Afghanistan to Pakistan and North-West India.

S67. Ans.(a)

Sol. Chand Bibi (1550–1599 CE), was an Indian Muslim regent and warrior. She acted as the Regent of Bijapur (1580–90) and Regent of Ahmednagar.

- Chand Bibi was a warrior from the Deccan region. She acted as a regent ruler of Bijapur Sultanate during 1580-90, under Ibrahim Adil Shah 2nd and Ahmednagar Sultanate during 1595-1600, under Bahadur Shah. She is famous for successfully defending Ahmednagar from the Mughal forces of Akbar in 1595.

S68. Ans.(c)

Sol. The correct answer is option C. Acid rain is a consequence of human activities, such as burning fossil fuels, which release sulfur dioxide and nitrogen oxides into the atmosphere. These pollutants react with water, oxygen, and other chemicals to produce various acidic compounds, which fall to the earth in the form of rain, snow, or dry particles. Acid rain has a pH value below 7 and can cause significant harm to the environment and living organisms, including damage to forests, lakes, rivers, and soil. It can also lead to the release of toxic metals and reduce the pH of soil, making it difficult for plants to absorb essential nutrients. Therefore, reducing emissions of sulfur dioxide and nitrogen oxides is crucial to preventing the formation of acid rain and its harmful effects on the environment.

S69. Ans.(c)

Sol. The greenhouse effect is the process by which certain gases in the Earth's atmosphere trap heat and warm the planet's surface. This process is essential for life on Earth, as it helps to keep the planet's temperature stable and within a range that is suitable for living organisms.

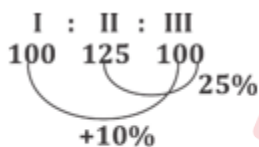
Excess ozone in the atmosphere, as stated in option B, can cause environmental problems, but it is not related to the greenhouse effect. Option A is incorrect, as the greenhouse effect does not refer to the warming of the Earth's surface by the sun, but the warming caused by the trapped heat.

S70. Ans.(d)

Sol. Water pollution is caused by a variety of factors, including industrial waste, domestic sewage, and agricultural runoff. Industrial waste can include chemicals, heavy metals, and other harmful substances that can contaminate water bodies. Domestic sewage can contain human waste, chemicals, and other pollutants that can also contaminate water sources. Agricultural runoff can contain pesticides, fertilizers, and other chemicals that can enter water bodies and cause harm to aquatic life and humans. Therefore, all of the above options are primary causes of water pollution, and the correct answer is D.

S71. Ans.(a)

Sol.



I : II
22 : 25

S72. Ans.(c)

Sol.

Profit = capital × time

Capital = $\frac{\text{Profit}}{\text{time}}$

Capital = $\frac{4}{3} : \frac{3}{2} : \frac{14}{7} \Rightarrow 8 : 9 : 12$

S73. Ans.(c)

Sol.

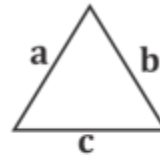
(SP) 56 % ----- 87500 Rs

(MP) 100% ----- 156250 Rs

S74. Ans.(b)

Sol.

Not possible



$a + b > c$

$a + c > b$

$b + c > a$

S75. Ans.(c)

Sol.

$P = 8000 \text{ Rs}$

$R\% = \frac{20\%}{2} = 10\%$

Time = $1 \times 2 = 2$

$C.I = \left[10 + 10 + \frac{10 \times 10}{100} \right] \% = 21\%$

$100\% \xrightarrow{\times 80} 8000 \text{ Rs}$

$21\% \xrightarrow{\times 80} 1680 \text{ Rs}$

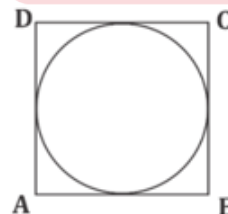
S76. Ans.(c)

Sol.

Total eggs = $100\% \xrightarrow{\times 3.5} 350$
 - rotten eggs = -12%
 Remaining eggs = $88\% \xrightarrow{\times 3.5} 308$

S77. Ans.(c)

Sol.



$AB + CD = BC + AD$

$18 + CD = 21 + 15$

$CD = 18 \text{ cm}$

S78. Ans.(c)

Sol.

$\sqrt{8 + \sqrt{1681}}$

$\sqrt{1681} = 41$

$\sqrt{8 + 41} = \sqrt{49} = 7$

S79. Ans.(a)

Sol.

$$\begin{aligned} \text{Income} &\Rightarrow 7 \times 2 : 4 \times 2 = 3 \times 2 \\ \text{Expenditure} &\Rightarrow 3 \times 2 : 1 \times 3 = 2 \times 3 \\ \text{Saving} &\frac{4800}{4800} \\ I &= 14 : 8 = 22 \xrightarrow{\times 960} 21120 \text{ Rs} \\ -e &= 9 : 3 = \\ s &\rightarrow \frac{4800}{5} \xrightarrow{\times 960} 4800 \text{ Rs} \end{aligned}$$

S80. Ans.(b)

Sol.

$$\text{Old : New} \\ \text{ratio of ratio} = 25 : 13$$

$$\text{ratio of surface area} = \frac{625}{456} : \frac{169}{456}$$

$$\frac{456}{625} \times 100 = 72.96\%$$

Alternate Method:

$$\text{Change in surface area} = 48 + 48 - \frac{48 \times 48}{100} = 72.96\%$$

S81. Ans.(c)

Sol.

I	II	
10x	10y	$x \times y = 15$
100xy = 1500		(1×15)
$xy = 15$	(3×5)	

Two possible

S82. Ans.(b)

Sol.

$$\text{cost price} = 5000 + 8000 = 13000 \text{ Rs}$$

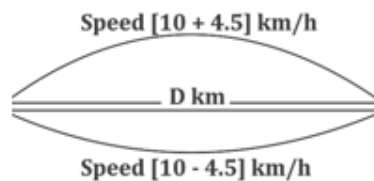
$$\text{Selling price} = 6000 + 10000 = 16000 \text{ Rs}$$

$$\text{Profit} = 16000 - 13000 = 3000 \text{ Rs}$$

$$\text{Profit} = \frac{3000}{13000} \times 100 = 23.08\%$$

S83. Ans.(c)

Sol.



$$\text{Distance} = \text{Time} \times \text{Speed}$$

$$\frac{D}{14.5} + \frac{D}{5.5} = 2$$

$$\frac{5.5D + 14.5D}{14.5 \times 5.5} = 2$$

$$D = \frac{2 \times 14.5 \times 5.5}{20} = 7.98 \text{ km}$$

S84. Ans.(c)

Sol.

$$\text{Sum of cubes of number} = \frac{x^2(x+1)^2}{4}$$

$$\begin{aligned} x &= 5 \\ &= \frac{25 \times 36}{4} \\ &= 25 \times 9 \end{aligned}$$

$$\text{Average} = \frac{\text{sum}}{\text{number}} \Rightarrow \frac{25 \times 9}{5} = 45$$

S85. Ans.(b)

Sol.

$$\frac{8000 \times R_1 \times 3}{100} - \frac{8000 \times R_2 \times 3}{100} = 800$$

$$R_1 - R_2 = 3 \frac{1}{3} \%$$

S86. Ans.(a)

Sol.

$$x + \frac{1}{x} = 4 \quad \text{find } x^2 + \frac{1}{x^2}$$

$$x^2 + \frac{1}{x^2} + 2 = 16$$

$$x^2 + \frac{1}{x^2} = 14$$

S87. Ans.(c)

Sol.

$$30 - [40 - \{56 - (25 - 13 - 12)\}]$$

$$30 - [40 - \{56 - 0\}]$$

$$30 - [40 - 56]$$

$$30 + 16$$

$$46$$

S88. Ans.(a)

Sol.

$$P = 25000 \text{ Rs}$$

$$R\% = 12\%$$

$$\text{Time} = 3 \text{ year}$$

$$\begin{array}{l} 12\% \quad 12\% \quad 12\% \\ \text{[24 + 1.44] \%} \\ 40.4928 \\ 25.44\% \\ \text{Successive} \end{array}$$

$$100\% \xrightarrow{\times 250} 25000 \text{ Rs}$$

$$40.4928\% \xrightarrow{\times 250} 10,123.20 \text{ Rs}$$

S89. Ans.(a)

Sol.

$$SI = P \times R\% \times T$$

$$P \times 21\% \times 8 : P \times 21\% \times 21$$

$$8 : 21$$

S90. Ans.(c)

Sol.

$$\sec^2\theta + \cos^2\theta = 1 \text{ is not correct}$$

S91. Ans.(c)

Sol.

$$\text{Average} = \frac{20 \times 32 - 29 - 31}{18} = 32.22$$

Second

$$32 + \frac{3 + 1}{18} = 32 + 0.22 = 32.22$$

S92. Ans.(a)

Sol.

$$\sqrt{20 - \sqrt{20 - \sqrt{20 - \sqrt{20 - \dots \infty}}}}$$

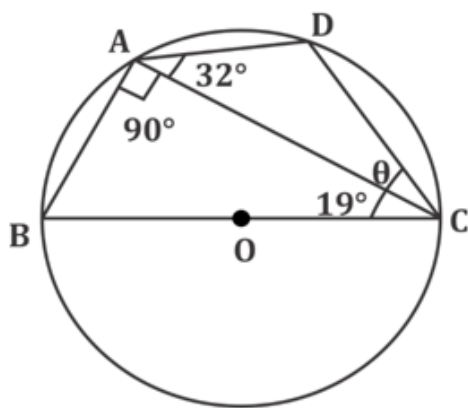
$$20 = 4 \times 5$$

Sign is (-Ve) \rightarrow 4 Ans

If sign is (+Ve) \rightarrow 5

S93. Ans.(c)

Sol.



$$\angle DAB + \angle DCB = 180^\circ$$

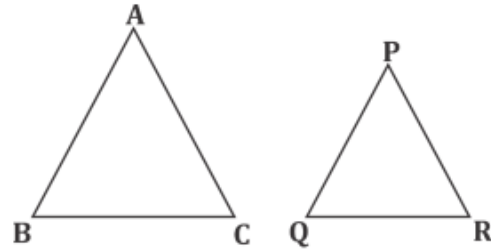
$$122^\circ + 19^\circ + \theta = 180^\circ$$

$$\theta = 39^\circ$$

$$\angle BAC = 90^\circ \text{ (Angle in a semicircle)}$$

S94. Ans.(a)

Sol.



$$\Delta ABC \sim \Delta PQR$$

$$\frac{\text{area of } \Delta ABC}{\text{area of } \Delta PQR} = \left(\frac{AB}{PQ}\right)^2 = \left(\frac{BC}{QR}\right)^2 = \left(\frac{AC}{PR}\right)^2$$

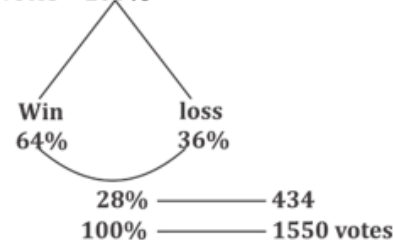
$$\text{ratio of area} = 196 : 625$$

$$\text{ratio of side} = \sqrt{196} : \sqrt{625} \Rightarrow 14 : 25$$

S95. Ans.(a)

Sol.

Total votes = 100%



S96. Ans.(c)

Sol.

P --- 18 days

Work done by $\rightarrow \frac{5}{18}$

Remaining work $\rightarrow 1 - \frac{5}{18} = \frac{13}{18}$

$\frac{13}{18}$ work done by (P+Q) $\rightarrow \frac{13}{5}$ days

P	18	1
	18	5
P+Q	$\frac{18}{5}$	5

Eff. Of Q = 4 units

Q will do $66\frac{2}{3}\%$ of work in $\rightarrow \frac{18}{4} \times \frac{2}{3} = 3 \text{ days}$

S97. Ans.(b)

Sol.

Income = Expenditure + saving

3 units = 2 units + 1 unit

S E

1 2

22% 10%

$$\% \text{ increase in income} = \frac{22 \times 1 + 10 \times 2}{3} = \frac{42}{3} = 14\%$$

S98. Ans.(c)

Sol.

$$\text{Daily wage of A+B} \rightarrow \frac{1800}{15} = \text{Rs. 1200}$$

Efficiency $\rightarrow A : B$

$$5 : 1$$

$$\text{Daily wage of A} = \frac{5}{6} \times 1200 = \text{Rs. 1000}$$

S99. Ans.(a)

Sol.

$$x = 32.5 \quad y = 34.6 \quad z = 30.9$$

Using identity,

$$x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$$

$$x^3 + y^3 + z^3 = \frac{1}{2}(98)[(2.1)^2 + (3.7)^2 + (1.6)^2]$$

$$= \frac{98}{2} (4.41 + 13.69 + 2.56)$$

$$\Rightarrow \frac{98}{2} \times 20.66 = 98 \times 10.33$$

For value of K,

$$0.98K = 98 \times 10.33$$

$$K = 1033$$

S100. Ans.(c)

Sol.

Let the speed of the bus is S

Then,

$$\text{Relative speed} = 75 - S \text{ bus} = \frac{120}{15} \times \frac{18}{5}$$

$$75 - S \text{ bus} = \frac{144}{5}$$

$$S \text{ bus} = 75 - 28.8$$

$$S \text{ bus} = 46.2 \text{ km/hr}$$

S101. Ans.(c)

Sol.

$$\text{SI in 3 years} = 6750 - 6000$$

$$= 750$$

$$\text{SI in 1 year} = 250$$

$$\text{SI in 4 years} = 1000$$

$$\text{Principal} = 6000 - 1000 = \text{Rs. 5000}$$

S102. Ans.(b)

Sol.

$$91A = 398$$

$$\frac{A}{B} = \frac{3}{7}$$

$$X = \frac{7}{3} \times 100 = \frac{700}{3}$$

$$X = \frac{700}{3}$$

S103. Ans.(a)

Sol.

$$x + \frac{1}{x} = 3, \quad X^3 + \frac{1}{x^3} = 18$$

$$\Rightarrow \frac{x^4 + 1/x^2}{x^2 + 5x + 1}$$

$$= \frac{x^3 + 1/x^3}{x + \frac{1}{x} + 5}$$

$$= \frac{18}{9}$$

$$= 9/4$$

S104. Ans.(c)

Sol.

$$\text{Distance covered} = 8 \times 2 \times \frac{22}{7} \times 7$$

$$\text{Time (in sec)} = 3 \times 60 + 40 = 220 \text{ sec}$$

$$\text{Speed} = \frac{8 \times 2 \times \frac{22}{7} \times 7}{220}$$

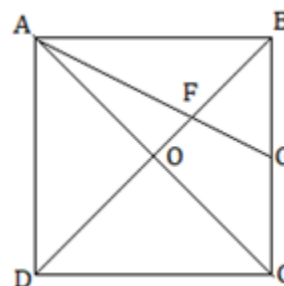
$$= \frac{8}{5} \text{ m/sec}$$

$$= \frac{8}{5} \times \frac{18}{5} \text{ km/h}$$

$$= \frac{144}{25} \text{ km/hr}$$

S105. Ans.(a)

Sol.



Let side of square = x units

& diagonal = $x\sqrt{2}$

$$OA = OB = OC = OD = AC/2 = X/\sqrt{2} \dots\dots\dots(i)$$

NOW in Triangle AOB and from angle bisector theorem

$$AB : AO = BF : OF$$

$$X : (X/\sqrt{2}) = \frac{BF}{OF}$$

$$\text{Let } BF = \sqrt{2} y, OF = y \dots\dots\dots(ii)$$

$$\text{Since } BF + OF = OB = x/\sqrt{2}$$

$$\sqrt{2} y + y = x/\sqrt{2}$$

$$y = \frac{x}{\sqrt{2}(\sqrt{2}+1)} = OF \dots\dots\dots(iii)$$

Now in ΔABC and from angle bisector theorem

$$AB : AC = BG : GC$$

$$x : \sqrt{2} x = BG : GC$$

$$1 : \sqrt{2} = BG : GC$$

$$\text{Let } BG = z \quad GC = \sqrt{2} z \dots\dots\dots(iv)$$

$$\text{Since } BG + GC = BC = x$$

$$z + \sqrt{2} z = x$$

$$z = \frac{x}{(\sqrt{2}+1)}$$

$$\sqrt{2} z = \frac{\sqrt{2}x}{(\sqrt{2}+1)} = CG \dots\dots\dots(v)$$

Now from equation (iii) and (v), we get

$$OF : CG = \frac{x}{\sqrt{2}(\sqrt{2}+1)} : \frac{\sqrt{2}x}{(\sqrt{2}+1)}$$

$$\therefore OF : CG = 1 : 2$$

S106. Ans.(c)

Sol.

$$C : M$$

$$A \rightarrow 4 : 3 \times 5$$

$$B \rightarrow 5 : 2 \times 6$$

$$\frac{50}{77} \times 100\% \approx 65\%$$

S107. Ans.(c)

Sol.

$$\begin{aligned} & \frac{3}{70} + \frac{1}{42} + \frac{1}{66} + \frac{3}{286} + \frac{1}{130} + \frac{1}{170} \\ &= \frac{3}{7 \times 10} + \frac{1}{7 \times 6} + \frac{1}{6 \times 11} + \frac{3}{2 \times 11 \times 13} + \frac{1}{13 \times 10} + \frac{1}{17 \times 10} \\ &= \frac{1}{7} \left[\frac{3}{10} + \frac{1}{6} \right] + \frac{1}{22} \left[\frac{1}{3} + \frac{3}{13} \right] + \frac{1}{10} \left[\frac{1}{13} + \frac{1}{17} \right] \\ &= \frac{1}{7} \times \frac{28}{60} + \frac{1}{22} \times \frac{22}{39} + \frac{1}{10} \times \frac{30}{17 \times 13} \\ &= \frac{1}{15} + \frac{1}{39} + \frac{3}{13 \times 17} \\ &= \frac{1}{15} + \frac{1}{13} \left[\frac{1}{3} + \frac{3}{17} \right] \\ &= \frac{1}{15} + \frac{1}{13} \left[\frac{26}{51} \right] \\ &= \frac{27}{51 \times 5} \\ &= \frac{9}{85} \end{aligned}$$

S108. Ans.(a)

Sol.

$$\begin{aligned} & \frac{\sqrt{26-7\sqrt{3}}}{\sqrt{14+5\sqrt{3}}} = \frac{b+a\sqrt{3}}{11} \\ & \text{Multiplying num. \& deno by 4.} \\ & \Rightarrow \frac{\sqrt{52-14\sqrt{3}}}{\sqrt{28+10\sqrt{3}}} = \frac{7-\sqrt{3}}{5+\sqrt{3}} \times \frac{5-\sqrt{3}}{5-\sqrt{3}} \\ & = \frac{35-12\sqrt{3}+3}{22} = \frac{19-6\sqrt{3}}{11} = \frac{b+a\sqrt{3}}{11} \\ & b = 19, a = -6 \\ & \sqrt{(b-a)} = \sqrt{(19-(-6))} = \sqrt{25} = 5 \end{aligned}$$

S109. Ans.(b)

Sol.

$$27x^3 - 64y^3 = (Ax + By)(cx^2 - Dy^2 + 12xy)$$

$$(3x)^3 - (4y)^3 = (3x - 4y)(9x^2 + 16y^2 + 12xy)$$

Comparing coefficients,

$$\text{We get, } A = 3, B = -4, C = 9, D = -16$$

$$4A+B+3C+2D = 12-4+27-32 = 3$$

S110. Ans.(c)

Sol.

$$\begin{array}{r} 9 \\ 789 \times \quad 8 \\ \hline 6378y \end{array}$$

$$784 \div 8, 30, y = 4$$

$$3 + x + y = 9$$

$$\text{At } y = 4, x = 2$$

$$xy = 8$$

S111. Ans.(a)

Sol. In a closed blood circulation system three types of blood vessels are present:

- **Arteries:** These carry pure oxygenated blood from the heart to different organs of the body. The wall of arteries is thick compared to veins due to higher blood pressure in arteries.
- **Veins:** These carry impure carbon dioxide-rich blood from body organs to the heart. The walls of veins are thin as compared to the arteries because the pressure of blood flow is low.
- **Capillaries:** These are present in organs, and these are the vessels through which exchange takes place. But we have exceptions.

Exceptions- The pulmonary vein carries oxygenated blood from the lungs to the heart. The pulmonary artery carries deoxygenated blood from the heart to the lungs.

Conclusion – The pulmonary vein is a type of vein which do not carry dioxide but carries oxygenated blood. B and C statements are incorrect as veins have a thin wall and it carries blood from different organs to the heart.

S112. Ans.(c)

Sol. Aluminium displaces zinc, copper, and iron from their solutions. Aluminum is the most reactive metal. Zinc displaces copper and iron from their solutions. Zinc is more reactive than Cu and Fe metals. Iron displaces copper from its solution. Therefore, copper is less reactive than iron. Copper does not displace any metal therefore it is the least reactive.

S113. Ans.(c)

Sol. Our Solar system consists of the Sun and 8 planets

1. Mercury (nearest to the sun)
2. Venus (Evening star, hottest planet)
3. Earth (only living planet, blue planet)
4. Mars (the red planet)
5. Jupiter (largest planet in the solar system)
6. Saturn (a planet with rings)
7. Uranus (coldest planet)
8. Neptune (farthest to the sun)

All planets in our solar system rotate counter-clockwise i.e., West to East except for Venus and Uranus. Two planets Venus and Uranus are rotating from east to west in our solar system. Venus and Uranus are rotating in the opposite direction to the sun, this is also known as a retrograde rotation.

S114. Ans.(c)

Sol. Amylase is the enzyme that catalyzes the hydrolysis of starch into simple sugars. So, if salivary amylase is lacking in saliva, the breakdown of starch is affected. Other phenomena such as protein breakdown to amino acids by protease enzyme and fat breakdown by bile in the small intestine. Whereas vitamins are absorbed by the small intestine. If salivary amylase is lacking in the saliva, starch breaks down into sugar events in the mouth cavity will be affected.

S115. Ans.(a)

Sol. Soap bubbles shine because of white light into constituent colors known as dispersion of light.

A rainbow is produced by the dispersion and internal reflection of light in water droplets in the atmosphere. White light from the sun enters a spherical raindrop. The different colors are refracted through different angles, reflected off the back of the drop, and then refracted again when they emerge from the drop.

We see that when light falls on a CD or a prism, it splits up into its many colors. The process of splitting up white into many colors is called dispersion. The band of colors produced when white light is split up is called a spectrum.

S116. Ans.(c)

Sol. Sliding friction, which occurs when one surface moves across another surface, is greater than rolling friction when a surface rolls over another surface.

The two sliding objects find less time to get interlocked against each other. So, they get less friction. Therefore, sliding friction is always less than static friction.

S117. Ans.(a)

Sol. The loudness of a sound is determined by its amplitude. So, a loud sound has a higher amplitude and a feeble sound has a lower amplitude. Hence, to change feeble sound to loud sound we have to increase its amplitude.

S118.Ans.(a)

Sol. All eukaryotic cells are not identical.

Plant and animal cells are different as the former possess cell walls, plastids, and a large central vacuole which are absent in animal cells.

On the other hand, animal cells have centrioles which are absent in almost all plant cells.

S119.Ans.(d)

Sol.

1. Ozone is maximally present in the stratosphere of the atmosphere.
2. In the atmosphere, the formation of ozone is a continuous process because UV rays have continuous action on the molecular oxygen.
3. In the presence of electrical discharge within the atmosphere, the UV rays break down molecular oxygen into nascent oxygen.
4. The nascent oxygen then combines with the molecular oxygen to form an ozone molecule.
5. Ozone which is also called trioxygen is an inorganic molecule.
6. It has a chemical formula O_3 .
7. Breaking down ozone to oxygen is a chemical change as ozone and oxygen are two different molecules having different physical and chemical properties.

S120.Ans.(d)

Sol. Biodiversity cannot refer to only fauna because animals depend on the flora for food. Animals need a producer in the ecosystem to survive.

The total number of individuals of a particular species in a given area is called the species population. Only one species does not show any diversity in that area.

Biodiversity refers to the different kinds of species of flora and fauna present in a given area. The term 'Biodiversity' was given by Edward Wilson.

Ecologists believe that communities with more species tend to be more stable than those with less species. Forests are hotspots for biodiversity. They are biodiversity-rich areas that are also the most threatened due to high levels of exploitation and human intervention.

S121.Ans.(c)

Sol. Other Fuel products: Petroleum wax, Petrol, Diesel, Paraffin Kerosene, Bitumen, LPG (Liquified Petroleum Gas) asphalt, LPG (Liquified Petroleum Gas) Naphthalene, Propane, Lubricant oils.

Rayon: It is a synthetic fiber made from regenerated cellulose. Rayon is made from the wood pulp of trees or plants such as eucalyptus, cotton, bamboo, soy, etc.

Caustic soda: It is made by passing electricity through the brine. Where brine is a highly concentrated solution of NaCl in water.

S122.Ans.(b)

Sol.

We have a solid rectangular box of iron that is kept over the table with different faces touching the table.

The block will exert a force on the table which is equal to the weight of the block.

Since the weight of the block will remain the same, the force applied by the box on the table will remain the same.

But, since, the surface area in contact with the table will be different in different cases, the pressure will differ.

Pressure is per unit thrust on a surface, hence pressure is directly proportional to thrust. The greater the thrust, the greater the pressure, and the smaller the thrust, the smaller the pressure.

S123.Ans.(c)

Sol. Mode of Reproduction in Plant

There are two modes of reproduction in plants: Sexual and Asexual. The sexual mode of reproduction takes place through flowers by transfer of pollen grains.

The asexual mode of reproduction includes vegetative propagation, spore formation, fragmentation, etc.

Flower as Reproductive Part

- The flower is considered the reproductive part of the plant in case of sexual reproduction.
- The flower contains a male part and a female part. The male part is known as the stamen and the female part is known as the pistil.
- The male part or stamen consists of an anther and filament.
- The anther produces pollen grains while the stamen supports the anther. Pollen grains contain male gametes.
- The female part or pistil consists of Ovary, stigma, and style. The ovary contains female gametes or ovules.
- Male and a female gamete fuse to form a zygote. This happens through the process of pollination.

S124.Ans.(c)

Sol. The inner lining of the stomach is protected by the mucus secreted by mucoid cells present in the cardiac and pyloric regions of the stomach. It is a glycoprotein that covers the gastric mucosa by forming a thick layer and protects it from the action of gastric enzymes and HCl.

S125.Ans.(b)

Sol. A plant having leaves with reticulate venation has tap roots while plants having leaves with parallel venation have fibrous roots.

The grass is a monocot having parallel venation and fibrous roots.

S126.Ans.(c)

Sol. Sodium is a highly reactive metal, and it easily and quickly reacts with water and atmospheric air. If we keep it open in the air, it will have a tendency to catch fire very fast. Therefore, the metal is kept in the kerosene. Phosphorus is also very reactive that's why it is kept in water to prevent it from undergoing a reaction with air.

S127.Ans.(a)

Sol. Copper metal when exposed to air turns green in color due to corrosion. When the copper vessel is exposed to air in the rainy season, the metal reacts with gases and moisture and atmospheric gases to form a mixture of copper carbonate and copper hydroxide.

S128.Ans.(b)

Sol.

- Crop rotation is the process of cultivating a different type of crop in every new crop cycle.
- The crops are selected in a manner that they use different nutrients from the soil.
- This ensures the enrichment of the soil due to crop rotation techniques.
- Manure is produced naturally from animal excreta or plant residues.
- Manure contains multiple elements or minerals which can replenish the soil back to the normal level.
- It is used as a natural process of fertilizing the land.
- Keeping the land uncultivated for some time allows the soil to regain its nutrients from the atmosphere. This will help the land gain back the nutrients it needs for plant growth.

S129.Ans.(a)

Sol. Kharif crops: Paddy, Maize, Cotton, Soyabean, and Groundnut. Rabi crops: Wheat, Gram, Mustard, Cotton, Linseed, and Peas.

S130.Ans.(c)

Sol.

Let the distance from X to Y is d

So, the distance traveled from X to Y or Y to X is d.

Total distance hence traveled is $d + d = 2d$

Speed of the Car moving from X to Y is V_1

Distance from moving X to Y is d

Time is taken, $t_1 = d/V_1$

Similarly, time is taken from moving Y to X, $t_2 = d/V_2$

Total time taken $t = t_1 + t_2 = d/V_2 + d/V_1$

Average speed is the total distance by the total time

The average speed is the harmonic mean of v_1 and v_2

$$\text{Average speed} = \frac{2 V_1 V_2}{v_1 + v_2}$$

S131. Ans.(a)

Sol. All magnets have north and south poles. Opposite poles are attracted to each other, while the same poles repel each other. When you rub a piece of iron along a magnet, the north-seeking poles of the atoms in the iron line up in the same direction. The force generated by the aligned atoms creates a magnetic field.

S132. Ans.(c)

Sol. The change in the position of an object with time can be represented on the speed-time graph. When the speed-time graph is a straight line parallel to the time axis then, the object is at rest and also moves at non-uniform speed.

S133. Ans.(c)

Sol. Sedimentation is the process of separating small particles and sediments in water. This process happens naturally when water is still because gravity will pull the heavier sediments down to form a sludge layer. Sedimentation is used to separate insoluble substances which are heavier than liquid.

S134. Ans.(b)

Sol. Jute - It will catch fire quickly and burn with a yellow flame. It will also have the same wood/leaf smell and light gray ashes after burning.

Wool burns with a flickering flame and leaves a black residue or black ash. Thus, wool after burning gives black ash.

Rayon - melts on burning.

S135. Ans.(b)

Sol. More chemical energy is converted to electrical energy when two cells are used. Consequently the flow of electricity is greater.

A bulb connected by two cells in parallel is equally bright as when connected to one cell. In both cases the voltage is 1.5 V. Two cells in parallel will last twice as long as a single cell. Two cells in series produce a brighter bulb, but will last as long as a single cell.

S136. Ans.(c)

Sol. Iron is required for proper functioning of thyroid gland and deficiency of it causes goitre. It is an endemic deficiency disease as it is usually suffered by people living in hilly regions. Deficiency of iron also causes mental retardation in children.

S137. Ans.(b)

Sol. A solar eclipse occurs when the Moon passes between Earth and the Sun, thereby obscuring Earth's view of the Sun, totally or partially. Such an alignment coincides with a new moon, indicating the Moon is closest to the plane of the Earth's orbit. In a total eclipse, the disk of the Sun is fully obscured by the Moon.

Sometimes when the Moon orbits Earth, the Moon moves between the Sun and Earth. When this happens, the Moon blocks the light of the Sun from reaching Earth. This causes an eclipse of the Sun, or a solar eclipse.

S138. Ans.(c)

Sol. Shadows are formed when an opaque object or material is placed in the path of rays of light. The opaque material does not let the light pass through it. The light rays that go past the edges of the material make an outline for the shadow.

A yellow object is an opaque object hence a black shadow will be formed. The size of the shadow will become larger as the distance between the source of light and the object is larger. So, the size always depends upon the relative distance between a light source.

The size of the shadow depends on the distance between the screen on which the shadow is being formed and the object and also on the distance between the light source and the object. Based on these parameters the size of a shadow can be smaller or bigger or the same as compared to the size of the opaque object.

S139. Ans.(c)

Sol. Stomata are minute pores present on the lower side of the leaves that help in the exchange of gases and water vapour. When the stomatal pores open the rate of transpiration increases, and when the pores are closed, the loss of water is reduced.

Position of stomata: Stomata are found on both surfaces of the leaf but there are usually more on the ventral (lower) surface of the leaf. This means that less water vapour is lost because the ventral side of the leaf is in the shade and therefore does not get as hot.

S140. Ans.(a)

Sol. The pistil is the innermost, seed-bearing, female part of a flower. It is located generally to the centre and consists of a swollen base called the ovary. The pistil can also be referred to as a collection of carpels, which are fused together.

The stigma often sits on top of the ovary and holds the style up to receive Pollen, then allows the pollen to be transferred to the ovule to fertilise it and create a seed.

The ovule is the organ that forms the seeds of flowering plants. It is borne in the ovary of the flower and consists of nucellus protected by integuments, precursors of embryo/endosperm, and seed coat, respectively.

S141. Ans.(b)

Sol. A drum vibrates with a low frequency therefore, it produces a low-pitched sound. While piano has high frequency so it produces a high pitched sound.

The sound an object makes changes depending on how fast it is vibrating. When an object vibrates quickly, high-pitched sounds are heard. Low-pitched sounds come from things that vibrate more slowly.

Loudness of the sound produced by a vibrating object depends on the amplitude of vibration. If we strike a drum softly, it produces a soft sound. Loudness is proportional to the square of the amplitude. Thus, if the amplitude is increased by three times, the loudness also increases by nine times.

S142. Ans.(c)

Sol. The motions of sun, moon, and Earth bring the three bodies into the correct alignment about once every 18 months. These are the times when eclipses can happen. As the daytime moon passes in front of the sun, it begins to cast a partial shadow (called the penumbra) onto Earth.

The force of attraction on a body by earth is called gravitational force. Example : The leaves and fruits fall from a tree downwards towards the ground, water in a river flows down streams, a ball thrown up goes to a height and then returns back on ground are some examples of motion due to gravitational force.

Gravity is what holds the planets in orbit around the sun and what keeps the moon in orbit around Earth. The gravitational pull of the moon pulls the seas towards it, causing the ocean tides. Gravity creates stars and planets by pulling together the material from which they are made.

S143. Ans.(a)

Sol. The Skating rink has a smooth surface as compared to a sea beach, cemented road, and wooden tiles that provide less friction due to which the ball travels the maximum distance.

S144. Ans.(c)

Sol. Colour of the solution from blue to green is due to the formation of iron sulphate. The brown deposit on the iron nail is copper, another new substance.

When few pieces of iron are dropped into a blue coloured copper sulphate solution, the blue colour fades and eventually turns into light green due to the formation of ferrous sulphate.

S145. Ans.(a)

Sol. Naphthalene balls are obtained from coal tar and are used as a moth repellent.

The labeled use of mothballs is to kill moths and other fiber insects to protect clothing. To do so properly, place mothballs inside tightly closed containers along with the clothing or materials. The vapors will remain inside the container and kill the moths.

S146. Ans.(c)

Sol. Sodium is a metal that can react with water to form Sodium hydroxide, a basic compound in nature. Hence, the phenolphthalein solution turns pink.

S147. Ans.(b)

Sol. Stifling treatments are applied to silk cocoons in order to kill the pupae, preventing the emergence of moths and allowing to preserve the silk during long periods of time. All of them involve the application of aggressive steps, such as sun exposure, hot steam from boiling water or hot air, during hours or even days.

The process of stifling is done by the methods of sun drying or giving steam or hot air. This process is done in sericulture for obtaining silk from the silkworms. It helps in preserving silk for a long duration.

Ahimsa silk production is a more humane option to traditional silk production. It can be made of any type of silk. Silk cocoons are harvested and processed only after the moth has hatched the cocoon in this method.

Hence, both A and R are true but R is not the correct explanation of A.

S148. Ans.(c)

Sol. When an acid combines with a base, it leads to the formation of the corresponding salt and water. This reaction is known as an acid-base reaction. The acid-base reaction can also be called a Neutralization reaction.

S149. Ans.(a)

Sol. Wilting can be caused by drought or waterlogged soil

Plants wilt when roots are unable to supply sufficient moisture to the stems and leaves. Wilting for short periods of time does not harm plants. Sometimes a plant wilts on a hot day because moisture is evaporating from the leaves faster than the roots can take it up.

Wilting occurs when there is excessive transpiration, and there are so many reasons for excessive transpiration. - In situations like drought conditions, where the water content of the soil drops very less, so here water absorption by plants becomes less, but transpiration remains the same may result in wilting.

S150. Ans.(b)

Sol. The adrenal glands are small glands attached to the top of each kidney. The human body has two adrenal glands that release chemical messengers called hormones into the bloodstream. These hormones travel via the blood to have an action in other parts of the human body.

Pituitary gland - It regulates growth, metabolism, and reproduction through the hormones that it produces. The production of these hormones is either stimulated or inhibited by chemical messages sent from the hypothalamus to the pituitary. The posterior lobe produces two hormones, vasopressin and oxytocin.

Growth hormone is released into the bloodstream from the anterior pituitary gland. The pituitary gland also produces other hormones that have different functions from growth hormone. Growth hormone acts on many parts of the body to promote growth in children.