STAFF SELECTION COMMISSION

COMBINED GRADUATE LEVEL (TIER-I)

SOLVED PAPER

(21st April 2022: Shift-1)

Time Allotted: 1 hour **Max marks:** 200

General Intelligence and Reasoning

1. Select the option that is related to the third number in the same way as the second number is related to the first number.
13 : 1,331 :: 17 : ?
1. 2,642 **2.** 1,453 **3.** 3,375 **4.** 1,829

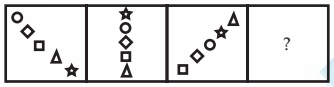
2. Select the number from among the given options that can replace the question mark (?) in the following series.
7, 16, 41, 94, 251, ?
1. 568 **2.** 468 **3.** 586 **4.** 486

3. Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster.
JST : HPX :: PWJ : ?
1. NTN **2.** MSR **3.** MTN **4.** NSP

4. Which two signs should be interchanged to make the given equation correct?
16 − 18 × 216 ÷ 432 + 40 = 20
1. + and − **2.** × and ÷ **3.** × and + **4.** ÷ and −

5. If A denotes 'addition', B denotes 'multiplication', C denotes 'subtraction', and D denotes 'division', then what will be the value of the following expression?
(45 D 9) B 5 A 8 B (7 A 3 C 6) C (28 D (4 D 4))
1. 82 **2.** 32 **3.** 29 **4.** 38

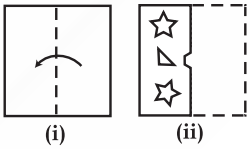
6. Select the figure from the given options that can replace the question mark (?) in the following series.



1.  **2.**  **3.**  **4.** 

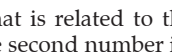
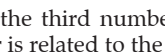
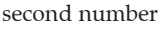
7. Select the correct option that indicates the arrangement of the given words in the order in which they appear in an English dictionary.
1. serenity **2.** serpent **3.** serviceable **4.** sericulture **5.** serotonin
1. 1, 4, 5, 2, 3 **2.** 1, 4, 2, 5, 3 **3.** 3, 4, 5, 2, 1 **4.** 2, 4, 5, 3, 1

8. The sequence of folding a piece of paper (figure i) and the manner in which the folded paper has been cut (figure ii) as shown in the following figures. Select the option that would most closely resemble the unfolded form of figure (ii).


(i) (ii)

1.  **2.**  **3.**  **4.** 

9. In a certain code language, 'TULIPS' is written as 'GFORKH'. How will 'GARDEN' be written in that language?
1. SZIXVM **2.** TZIWUM **3.** TBIWVK **4.** TZIWVM

10. Select the correct water image of the given combination.
5 9 2 1 6 R g m
1.  **2.** 
3.  **4.** 

11. In a certain code language, 'GANGA' is coded as 21-3-42-21-3 and 'KOSHI' is coded as 33-45-57-24-27. How will 'GOMTI' be coded in that language?
1. 14-45-26-60-27 **2.** 21-45-39-60-27
3. 21-30-39-40-18 **4.** 14-30-39-40-18

12. Select the option that is embedded in the given figure (X) (rotation is NOT allowed).


(X)

1.  **2.**  **3.**  **4.** 

13. Three different positions of the same dice are shown. Study the same and identify which of the following statements is correct.

1. 1 is opposite to 4 **2.** 3 is opposite to 6
3. 6 is opposite to 1 **4.** 5 is opposite to 2

14. Study the given pattern carefully and select the number from the given options that can replace the question mark (?) in it.

13	16	52
15	24	90
23	36	?

1. 81 **2.** 108 **3.** 207 **4.** 117

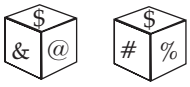
15. The ratio of the sum and the difference between two numbers is 6 : 5. Find the ratio of these two numbers.
1. 3 : 2 **2.** 7 : 5 **3.** 2 : 3 **4.** 11 : 1

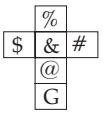
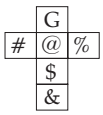
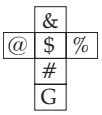
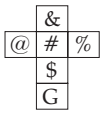
16. 'A # B' means 'A is the sister of B'.
'A $ B' means 'A is the father of B'.
'A @ B' means 'A is the wife of B'.
'A % B' means 'A is the brother of B'.
Which of the following options means 'J is the father of R'?
1. C @ J % K $ M # R **2.** C @ R $ K % M # J
3. C @ J $ K % M # R **4.** J @ C $ K % M # R

17. Select the Venn diagram that best represents the relationship between the following.
India, Delhi, Assam, Guwahati

1.  **2.**  **3.**  **4.** 

18. Two orientations of a dice are shown. Which of the option figure can be obtained by folding this dice along the lines?



1. 
2. 
3. 
4. 

19. In a certain code language, 'are you ready' is written as '541', 'we are going' is written as '261', and 'she is ready' is written as '498'. How will 'you' be written in that language?
1. 6 **2.** 1 **3.** 5 **4.** 4

20. Select the number from the given options that can replace the question mark (?) in the following series.
1, 1, 2, 2, 6, 10, 42, ?, 1,806
1. 1,302 **2.** 1,203 **3.** 1,010 **4.** 1,389

21. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true even if it appears to be at variance with commonly known facts decide which of the given conclusions logically follow(s) from the statements.
Statements:
All peelers are funnels.
Some peelers are spatulas.
Conclusions:
I. Some peelers are not funnels.
II. Some spatulas are peelers.
1. Both conclusions I and II follow.
2. Only conclusion II follows.
3. Neither conclusion I nor II follows.
4. Only conclusion I follows.

22. Select the letter from among the given options that replace the question mark (?) in the following series.
E, F, I, N, U, ?
1. A **2.** D **3.** N **4.** Z

23. Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the letter-cluster that is different.
1. EVAF **2.** CXBH **3.** KPUZ **4.** TGLQ

24. Select the letter-cluster from the given options that can replace the question mark (?) in the following series.
CALI, ZEGO, WIBU, TMWA,?
1. QPSF **2.** QRQE **3.** QQRE **4.** QSPF

25. Eight friends, A, B, C, D, E, F, G and H, are sitting in two lines of four persons each. Both the lines are facing each other. A is facing D. E is to the immediate left of G. H is to the immediate right of B. C is facing G. F is facing H. B is to the immediate right of the person who is facing G. D is to the immediate left of F. Which four persons are sitting in the same line?
1. A, B, C, H **2.** B, C, D, H **3.** A, C, F, G **4.** C, D, E, F

General Awareness

26. Sri Akal Takht Sahib is located in the campus of _____.
1. Golden Temple **2.** Paonta Sahib
3. Patna Sahib **4.** Gurudwara Bangla Sahib

27. As of April 2021, _____ held the record for the highest individual Women's ODI cricket score by an Indian player. She was also the only Indian spinner to take six women's ODI wickets.
1. Taniya Bhatia **2.** Deepti Sharma
3. Radha Yadav **4.** Punam Raut

28. The Fiscal Responsibility and Budget Management Act 2003 set a target to limit India's fiscal deficit up to _____ of the GDP by 2021.
1. 2% **2.** 3% **3.** 6% **4.** 5%

29. In which dance form a dancer balances a pot of burning diyas on his head?
1. Dhangari gaza dance **2.** Koli dance
3. Tamasha dance **4.** Chari dance

30. Who was the Australian Open Women's Singles champion in 2021?
1. Serena Williams **2.** Venus Williams
3. Jennifer Brady **4.** Naomi Osaka

31. Adar Poonawalla launched the Clean City initiative in Pune in the year _____.
1. 2018 **2.** 2012 **3.** 2010 **4.** 2015

32. Who among the following became a part of the Constituent Assembly from Madras Constituency in 1946?
1. Ammu Swaminathan **2.** Hansa Jivraj Mehta
3. Kamla Chaudhry **4.** Begum Aizaz Rasul

33. Solids like fats, grease and oil that float on top of liquid wastewater is called _____.
1. urea **2.** sludge **3.** compost **4.** peat

34. Which of the following statements was quoted by Subhash Chandra Bose?
1. Live as if you were to die tomorrow. Learn as if you were to live forever.
2. The best way to find yourself is to lose yourself in the service of others.
3. Give me blood and I will give you freedom.
4. First, they ignore you, then they laugh at you, then they fight you, then you win.

35. In order to get clean drinking water, disinfectant is used after filtration. Disinfectant, however, is NOT used for removing:
1. viruses **2.** parasites **3.** minerals **4.** bacteria

36. Gnomon is a part of _____.
1. solar clock **2.** bolometer **3.** binoculars **4.** transformer

37. The Vernacular Press Act of 1878 was repealed during the tenure of Viceroy _____.
1. Lord Ripon **2.** Lord Dufferin
3. Lord Lansdowne **4.** Lord Northbrook

38. Who among the following Indian artists won the 'Joan Miro Prize' for the year 2019?
1. Jogen Chowdhury **2.** Nalini Malani
3. Anjolie Ela Menon **4.** Jiten Thukral

39. Which of the following is more suitable than others for the growth of cashew nut?
1. Red laterite soil **2.** Black cotton soil
3. Alluvial soil **4.** Arid soil

40. Ashokan Minor Rock Edicts are found in different parts of India. Which of the following is NOT a find spot of Ashokan Minor Rock Edicts in Karnataka?
1. Brahmagiri **2.** Gavimath **3.** Rupnath **4.** Maski

41. Under the National Urban Sanitation Policy, a city that scores points between 34 and 66 and needs considerable improvement is colour-coded _____.
1. green **2.** black **3.** blue **4.** red

42. _____ Saptapadi ritual considers the marriage to be complete and auspicious.
1. The Indian Christian Marriage Act, 1862
2. The Hindu Marriage Act, 1955
3. The Muslim Personal Law (Shariat) Application Act, 1937
4. The Parsi Marriage and Divorce Act, 1936

43. The Government of India imposed an Agriculture and Infrastructure Development Cess of _____ per litre on petrol through Union Budget 2021–22.
1. ₹3.5 **2.** ₹3 **3.** ₹2.5 **4.** ₹4

44. Which of the following person was named as the Dean of Harvard Business School in October, 2020?
1. Sanjit Roy **2.** Achyuta Samanta
3. Srikant Datar **4.** Nitin Nohria

45. Which of the following Amendments of the Constitution of India was enacted in 1993 to constitutionally recognise municipal governments?
1. 73rd Constitutional Amendment Act (CAA), 1990
2. 72nd Constitutional Amendment Act (CAA), 1989

3. 74th Constitutional Amendment Act (CAA), 1992
4. 71st Constitutional Amendment Act (CAA), 1988

46. The Annapurna peak belongs to which region of the Himalayas?
1. Nepal **2.** Garhwal **3.** Bhutan **4.** Kumaon

47. As per WHO (World Health Organisation), which of the following is NOT an example of disinfection by-products formed at traditional drinking water treatment plants?
1. Titania **2.** Bromate **3.** Chlorate **4.** Chlorite

48. The picture that won the World Press Photo of the Year 2021 contest is titled '_____'.
1. The First Embrace **2.** Crying Girl on the Border
3. Emancipation Memorial Debate
4. Straight Voice

49. Which of the following states has the lowest female sex ratio according to the 2011 Census?
1. Uttar Pradesh **2.** Punjab
3. Sikkim **4.** Haryana

50. Who among the following was the first Indian Governor of Reserve Bank of India?
1. CD Deshmukh **2.** HVR Lengar
3. PC Bhattacharya **4.** LK Jha

Quantitative Aptitude

51. A shopkeeper bought toffees at a rate of 10 for ₹15 and sold them at a rate of 16 for ₹40. Find his profit percentage. (correct to two decimal places)
1. 65.05% **2.** 33.33% **3.** 50.55% **4.** 66.67%

52. From the masthead of a ship of 180 m height to the boat, a depression angle of 60 degrees is formed. Find the distance (in m) of the boat from the ship.
1. 360 **2.** $60\sqrt{3}$ **3.** $180\sqrt{3}$ **4.** 180

53. Find the value of the following expression:

$$\frac{4\frac{1}{3}+3\frac{1}{3}\times1\frac{4}{5}\div3\frac{3}{4}\times\left(6\frac{1}{4}\text{ of }1\frac{1}{15}\right)}{\frac{2}{5}\div\frac{5}{6}\times\frac{2}{3}}$$

1. $25\frac{1}{8}$ **2.** $28\frac{1}{8}$ **3.** $289\frac{3}{8}$ **4.** $12\frac{1}{2}$

54. Find the smallest number which should be added to the smallest number divisible by 6, 9 and 15 to make it a perfect square.
1. 10 **2.** 9 **3.** 19 **4.** 21

55. The radii of two concentric circles with centre O are 26 cm and 16 cm. Chord AB of the larger circle is tangent to the smaller circle at C and AD is a diameter. What is the length of D?
1. 42 cm **2.** 36 cm **3.** 35 cm **4.** 38 cm

56. Find the sum of the greatest and the smallest number which may replace k in the number 3281k6 to make the number divisible by 6.
1. 9 **2.** 8 **3.** 5 **4.** 4

57. A household appliances company offers two successive discounts of 20% and 35% on the sale of a food processor. What is the final sale price (in ₹, to the nearest rupee) of a food processor costing ₹4,580?
1. 2,519 **2.** 2,977 **3.** 2,382 **4.** 3,664

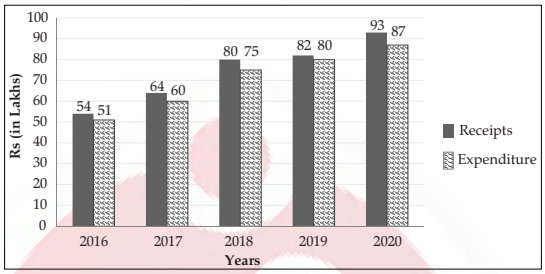
58. If $5x-\frac{1}{4x}=6$, $x>0$, then find the value of $25x^2-\frac{1}{16x^2}$.
1. $6\sqrt{41}$ **2.** 36 **3.** $\sqrt{246}$ **4.** $6\sqrt{31}$

59. In triangle ABC, the bisector of angle BAC meets BC at point D in such a way that AB = 10 cm, AC = 15 cm and BD = 6 cm. Find the length of BC (in cm).
1. 17 **2.** 11 **3.** 15 **4.** 9

60. A and B working alone can complete a work in 8 days and 12 days, respectively. They started working together, but A left 2 days before completion of the work. In how many days was the work completed?
1. 6 **2.** 5 **3.** 8 **4.** 10

61. A started a business by investing ₹65,000. After a few months, B joined him by investing ₹50,000. Three months after the joining of B, C joined the two with an investment of ₹55,000. At the end of the year, A got 50% of profit as his share. For how many months did A alone finance the business?
1. 2 **2.** 3 **3.** 5 **4.** 4

62. The following bar graph shows receipts and expenditure by a business firm over 5 years. Gain = Receipts – Expenditure. In which year did the company gain the minimum amount?



1. 2016 **2.** 2017 **3.** 2019 **4.** 2018

63. Three positive numbers are in the ratio 2 : 3 : 4. The sum of their squares is 2,349. The average of the first two numbers is:
1. 36 **2.** 27.5 **3.** 18 **4.** 22.5

64. The sides of a triangular field are 360 m, 480 m and 600 m. Its area is equal to the area of a square field. What is the side (in m) of the square field?
1. $120\sqrt{6}$ **2.** $160\sqrt{6}$ **3.** $160\sqrt{3}$ **4.** $120\sqrt{3}$

65. A person's salary was decreased by 50% and subsequently increased by 50%. By how much percent does his salary increase or decrease?
1. Decrease 18% **2.** Increase 15%
3. Increase 20% **4.** Decrease 25%

66. In ΔABC, D, E and F are the mid-points of side BC, CA and AB, respectively. If BC = 25.6 cm, CA = 18.8 cm and AB = 20.4 cm, what is the perimeter (in cm) of the ΔDEF?
1. 36.8 **2.** 30.6 **3.** 32.4 **4.** 34.4

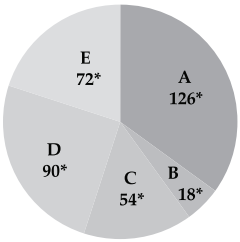
67. Find the value of the following expression:

$$\frac{(7.03)^3-0.027}{(7.03)^2+2.109+(0.3)^2}$$

1. 7.06 **2.** 7 **3.** 7.33 **4.** 6.73

68. Anil lent a sum of ₹5,000 on simple interest for 10 years in such a way that the rate of interest is 6% per annum for the first 2 years, 8% per annum for the next 2 years and 10% per annum beyond 4 years. How much interest (in ₹) will he earn at the end of 10 years?
1. 5,000 **2.** 4,400 **3.** 4,200 **4.** 3,500

69. The breakup of the total number of employees of a company working in different offices (A to E), in degrees is given in the pie chart.
Total number of employees = 2,400.
If 40%, of the number of employees in office A are shifted equally to office B and E, then what will be the sum of the number of employees in B and C?



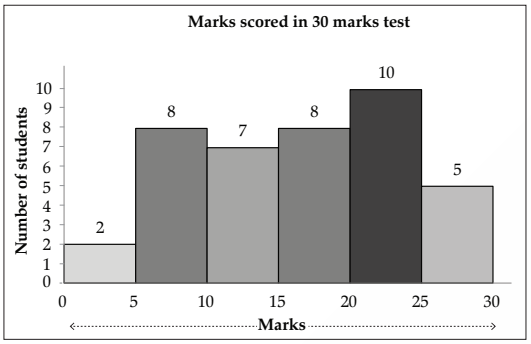
1. 648 **2.** 735 **3.** 545 **4.** 72

70. O is the centre of a circle of radius 10 cm. P is a point outside the circle and PQ is a tangent to the circle. What is the length (in cm) of PQ if the length OP is 26 cm?
1. $2\sqrt{194}$ **2.** 20 **3.** 25 **4.** 24

71. If A = 30°, what is the value of $\frac{\left[8\sin A + 11\,\text{cosec}\,A - \cot^2 A\right]}{10\cos^2 A}$?
1. $5\frac{1}{5}$ **2.** $4\frac{3}{5}$ **3.** $4\frac{2}{5}$ **4.** $3\frac{4}{5}$

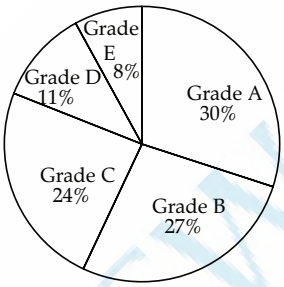
72. The distance between two stations A and B is 200 km. A train runs from A to B at a speed of 75 km/h, while another train runs from B to A at a speed of 85 km/h. What will be the distance between the two trains (in km) 3 minutes before they meet?
1. 5 **2.** 8 **3.** 10 **4.** 6

73. The following histogram shows the marks scored by 40 students in a test of 30 marks. A student has to score a minimum of 10 marks to pass the test.
What is the percentage of students who passed the test?



1. 75% **2.** 30% **3.** 72% **4.** 66.66%

74. The performance of 1,800 students in grades has been shown in the following pie chart.
The number of students getting grade B is what percentage of the number of students getting grade A?



1. 97% **2.** 90% **3.** 95% **4.** 85%

75. If (2 cos A + 1) (2 cos A – 1) = 0, 0° < A ≤ 90°, then find the value of A.
1. 90° **2.** 45° **3.** 30° **4.** 60°

English Comprehension

76. Select the most appropriate option to substitute the underlined segment in the given sentence. If there is no need to substitute it, select 'No substitution required'.
If Vinay has the book why **he is not giving you ?**
1. he not giving it to you **2.** is he not giving it to you
3. he is not gave to you **4.** No substitution required

77. Select the option that can be used as a one-word substitute for the given group of words.
A person above a hundred years in age.
1. Centenarian **2.** Venerable **3.** Aged **4.** Geriatric

78. Select the most appropriate antonym of the given word.
Frenzy
1. Craze **2.** Rage **3.** Calm **4.** Fury

79. Select the most appropriate option to fill in the blank.
The new Vande Bharat trains will have some additional _____ such as emergency windows for evacuation, disaster lights, etc.
1. types **2.** qualities **3.** features **4.** pieces

80. Select the option that expresses the given sentence in reported speech.
Mother said to her, "I expected a better result from you."
1. Mother told her that she had expected a better result from her.
2. Mother told her that she expected a better result from her.
3. Mother told her that she was expecting a better result from you.
4. Mother told her that she expected a better result from you.

81. Select the most appropriate meaning of the given idiom.
Hit a brick wall.
1. Demolish a brick wall
2. Not able to make any progress
3. Use physical force **4.** Fight a powerful foe

82. Select the most appropriate meaning of the given idiom.
To sit on the fence.
1. Occupy a bench next to a boundary
2. Avoid taking sides **3.** Take a high seat
4. Place something on a barrier

83. Select the option that can be used as a one-word substitute for the given group of words.
A person who collects or studies stamps.
1. Numismatist **2.** Hoarder
3. Collector **4.** Philatelist

84. Select the option that expresses the given sentence in active voice.
Rishabh was declared fit to play the next match.
1. Rishabh declared them fit to play the next match.
2. They will declare Rishabh fit to play the next match.
3. They declared Rishabh fit to play the next match.
4. They had declared Rishabh fit to play the next match.

85. Select the most appropriate option that can substitute the underlined segment in the given sentence. If there is no need to substitute it, select 'No substitution required'.
Whom was the person that you wanted me to contact there?
1. No substitution required **2.** Who is the person
3. Whom is the person **4.** Whom were the persons

86. Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the correct order to form a meaningful and coherent paragraph.
A. The British were exploiting the indigo farmers in the area.
B. He lived in the district until the exploitation of the farmers was successfully stopped.
C. Gandhiji's Satyagraha for India's Independence began with the famous 'Champaran movement' in Bihar.
D. So, Gandhiji visited Motihari, the district headquarters of Champaran, in 1917 to protest against the British.
1. ADBC **2.** CABD **3.** ACBD **4.** CADB

87. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.
Paul was / bited by a dog / when he / was a child.
1. when he **2.** bited by a dog
3. Paul was **4.** was a child

88. The following sentence has been divided into parts. One of them contains an error. Select the part that contains the error from the given options.
You and I / have submitted / your work / on time.
1. on time **2.** your work
3. have submitted **4.** You and I

89. The following sentence has been divided into parts. One of them may contain a grammatical error. Select the part that contains the error from the given options. If you don't find any error, mark 'No error' as your answer.
They ordered the whole area / to be disinfected / on the earliest.
1. to be disinfected
2. They ordered the whole area
3. on the earliest **4.** No error

90. Select the INCORRECTLY spelt word.
1. Voluntary **2.** Disparity
3. Continuanse **4.** Convincing

91. Select the most appropriate synonym of the given word.
Honest
1. Secretive **2.** Sincere **3.** Daring **4.** Strange

92. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.
I did not / buy neither / of the / two dresses.
1. two dresses **2.** of the **3.** I did not **4.** buy neither

93. Select the option that expresses the given sentence in passive voice.
She baked a large blueberry cake.
1. A large blueberry cake was being baked by her.
2. A large blueberry cake has been baked by her.
3. A large blueberry cake was baked by her.
4. A large blueberry cake is baked by her.

94. Select the most appropriate antonym of the given word.
Graceful
1. Awkward **2.** Dignified **3.** Refined **4.** Polite

95. Select the most appropriate synonym of the given word.
Imbue
1. Remove **2.** Clear **3.** Instil **4.** Deprive

In the following passage, some words have been deleted. Select the most appropriate option to fill in each blank.
(1) _____ changes in science and technology lead to modernisation of technology as well as upgradation of knowledge. In order to upgrade or modernise technology, management must (2) _____ employees to accept new technology. (3) _____ training of staff becomes necessary to update their knowledge and to (4) _____ their skills. This is possible only (5) _____ effective communication between the management and the employees.

96. Select the most appropriate option to fill in blank number 1.
1. No **2.** Slow **3.** Ultimate **4.** Rapid

97. Select the most appropriate option to fill in blank number 2.
1. dissuade **2.** discourage **3.** persuade **4.** deactivate

98. Select the most appropriate option to fill in blank number 3.
1. Intermittent **2.** Irregular **3.** Regular **4.** Improper

99. Select the most appropriate option to fill in blank number 4.
1. hamper **2.** enhance **3.** imitate **4.** decrease

100. Select the most appropriate option to fill in blank number 5.
1. by **2.** through **3.** throughout **4.** with

Answer Key

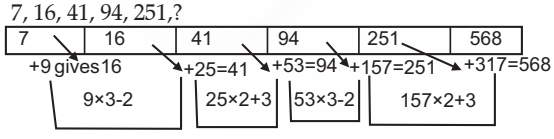
1. (3)	**2.** (1)	**3.** (1)	**4.** (2)	**5.** (3)	**6.** (1)	**7.** (1)	**8.** (3)	**9.** (4)	**10.** (4)	**11.** (2)	**12.** (3)	**13.** (3)
14. (3)	**15.** (4)	**16.** (3)	**17.** (2)	**18.** (3)	**19.** (3)	**20.** (3)	**21.** (2)	**22.** (2)	**23.** (2)	**24.** (3)	**25.** (1)	**26.** (1)
27. (2)	**28.** (2)	**29.** (4)	**30.** (4)	**31.** (4)	**32.** (1)	**33.** (2)	**34.** (3)	**35.** (3)	**36.** (1)	**37.** (1)	**38.** (2)	**39.** (1)
40. (3)	**41.** (2)	**42.** (2)	**43.** (3)	**44.** (3)	**45.** (3)	**46.** (1)	**47.** (1)	**48.** (1)	**49.** (4)	**50.** (1)	**51.** (4)	**52.** (2)
53. (2)	**54.** (1)	**55.** (4)	**56.** (2)	**57.** (3)	**58.** (1)	**59.** (3)	**60.** (1)	**61.** (2)	**62.** (3)	**63.** (4)	**64.** (1)	**65.** (4)
66. (3)	**67.** (4)	**68.** (2)	**69.** (1)	**70.** (4)	**71.** (2)	**72.** (2)	**73.** (1)	**74.** (2)	**75.** (4)	**76.** (2)	**77.** (1)	**78.** (3)
79. (3)	**80.** (1)	**81.** (2)	**82.** (2)	**83.** (4)	**84.** (3)	**85.** (2)	**86.** (4)	**87.** (2)	**88.** (2)	**89.** (1)	**90.** (3)	**91.** (2)
92. (4)	**93.** (3)	**94.** (1)	**95.** (3)	**96.** (4)	**97.** (3)	**98.** (3)	**99.** (2)	**100.** (2)				

Answers with Explanations

General Intelligence and Reasoning

1. Option (3) is correct.
Explanation: Given that:
13: 1331:: 17 :?
$(13 - 2)^3 = (11)^3 = 1{,}331$
$(17 - 2)^3 = (15)^3 = 3{,}375$

2. Option (1) is correct.
Explanation: Given series is as follows:
7, 16, 41, 94, 251,?



3. Option (1) is correct.
Explanation:
Table of alphabetical series (point to remember)

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14

Given that: JST : HPX :: PWJ : ?
As,

J	S	T
10	19	20
↓	↓	↓
–2	–3	+4
H	P	X
8	16	24

Here, each letter is decreased by –2, –3, and –4 respectively. Therefore, PWJ : NTN is the correct answer.

4. Option (2) is correct.

Explanation: Given that:

$16 - 18 \times 216 \div 432 + 40 = 20$

B	Bracket in order (), [], {}
O	Of
D	Division (÷)
M	Multiplication (×)
A	Addition (+)
S	Subtraction (–)

(1) + and –

LHS $= 16 + 18 \times 216 \div 432 - 40$

$= 16 + 18 \times 0.5 - 40$

$= 16 + 9 - 40$

$= 25 - 40 = -15 \neq 20 \neq$ RHS

(2) × and ÷

LHS $= 16 - 18 \div 216 \times 432 + 40$

$= 16 - \left(\frac{1}{12}\right) \times 432 + 40$

$= 16 - 36 + 40$

$= 56 - 36 = 20 =$ RHS

(3) × and +

LHS $= 16 - 18 + 216 \div 432 \times 40$

$= 16 - 18 + 0.5 \times 40$

$= 16 - 18 + 20$

$= 36 - 18 = 18 \neq 20 \neq$ RHS

(4) ÷ and –

LHS $= 16 \div 18 \times 216 - 432 + 40$

$= 0.888 \times 216 - 432 + 40$

$= 192 - 432 + 40$

$= 232 - 432 = -200 \neq 20 \neq$ RHS

5. Option (3) is correct.

Explanation: According to the BODMAS rule,

B	Bracket in order (), [], {}
O	Of
D	Division (÷)
M	Multiplication (×)
A	Addition (+)
S	Subtraction (–)

Now,

A = +

B = ×

C = –

D = ÷

(45 D 9) B 5 A 8 B (7 A 3 C 6) C (28 D (4 D 4))

$= (45 \div 9) \times 5 + 8 \times (7 + 3 - 6) - (28 \div (4 \div 4))$

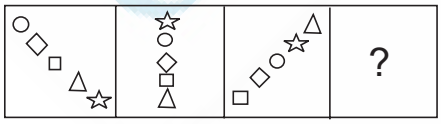
$= 5 \times 5 + 8 \times (10 - 6) - (28 \div 1)$

$= 5 \times 5 + 8 \times 4 - 28$

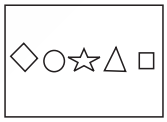
$= 25 + 32 - 28 = 57 - 28 = 29$

6. Option (1) is correct.

Explanation:



The bottom most element becomes the top most element and the whole series is rotated by 45 degrees clockwise.



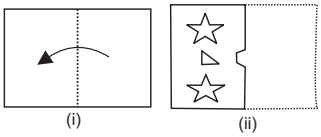
7. Option (1) is correct.

Explanation:

Serenity	Sericulture	Serotonin	Serpent	Serviceable

8. Option (3) is correct.

Explanation:



Logic of symmetry will be followed here.

9. Option (4) is correct.

Explanation:

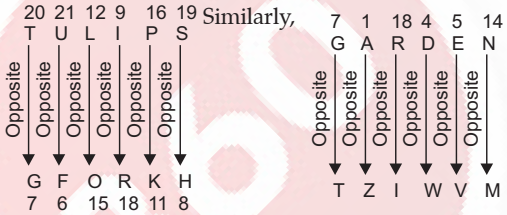
Table of Alphabetical series (point to remember)

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14

Given that:

'TULIPS' is written as 'GFORKH'.

Similarly,

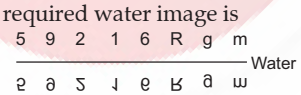


10. Option (4) is correct.

Explanation:

In the water image, top becomes bottom and bottom becomes top.

Hence, the required water image is



11. Option (2) is correct.

Explanation:

Table of Alphabetical series (point to remember)

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14

Now,

G	A	N	G	A
7	1	14	7	1
×3	×3	×3	×3	×3
21	3	42	21	3

Similarly,

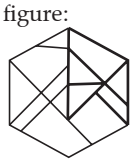
K	O	S	H	I
11	15	19	8	9
×3	×3	×3	×3	×3
33	45	57	24	27

Hence,

G	O	M	T	I
7	15	13	20	9
×3	×3	×3	×3	×3
21	45	39	60	27

12. Option (3) is correct.

Explanation: Given figure:

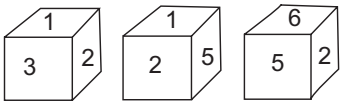


(X)

We have to find the embedded figure from the option figures without rotation. Hence,

13. Option (3) is correct.

Explanation:



When 2 faces of the dice are common, then the remaining 3rd side will be opposite to each other from dice 1 and dice 2.

3 and 5 - opposite

From dice 2 and dice 3

6 and 1 - opposite

14. Option (3) is correct.

Explanation: Given that:

13 16 52

15 24 90

23 36 ?

The logic follows here:

Row wise

(2nd number ÷ 4) × (1st number) = 3rd number

Row 1 → (16 ÷ 4) × (13) = 52

Row 2 → (24 ÷ 4) × (15) = 90

Similarly,

Row 3 → (36 ÷ 4) × (23) = 207

15. Option (4) is correct.

Explanation:

Let the numbers be x and y

According to question:

$$\frac{x+y}{x-y}=\frac{6}{5}$$

$$5(x+y)=6(x-y)$$

$$5x+5y=6x-6y$$

$$5y+6y=6x-5x$$

$$11y=x$$

$$\frac{x}{y}=\frac{11}{1}$$

Or

$$x:y=11:1$$

16. Option (3) is correct.

Explanation: Given that:

'A # B' means 'A is the sister of B';

'A $ B' means 'A is the father of B'.

'A @ B' means 'A is the wife of B'.

'A % B' means 'A is the brother of B'.

Now, Family chart

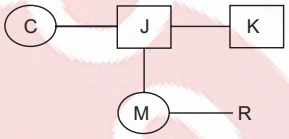
Symbol in Diagram	Meaning
	Female
	Male
	Married couple
	Siblings
	Difference of a generation

Decoding the given symbols:

J is				
Symbol	#	$	@	%
Meaning	Sister	Father	Wife	Brother
of R				

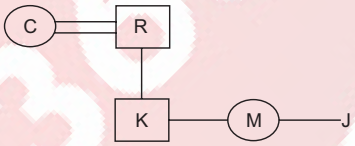
Let's check the options one by one:

(1) C @ J % K $ M # R



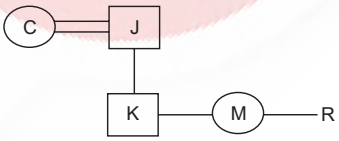
Here, we can see that, J is the maternal uncle of R. Hence, it is false.

(2) C @ R $ K % M # J



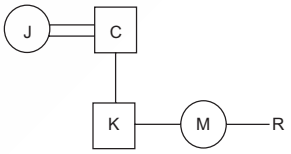
Here, we can see that the gender of J is unknown and we cannot decide its relation. Hence, it is false.

(3) C @ J $ K % M # R



Here, we can see that, J is the father of R, hence it is true.

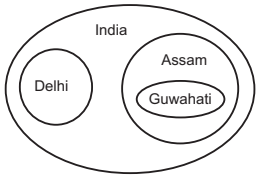
(4) J @ C $ K % M # R



Here, we can see that, J is the father of R, hence it is false.

17. Option (2) is correct.

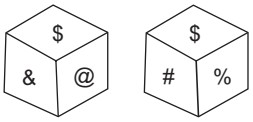
Explanation:



18. Option (3) is correct.

Explanation:

Find the common face in both dice and write elements either in a clockwise or anticlockwise direction. From that face



Dice 1 ----------%----@-----&----- not opposite to each other.
Dice 2 ---------$----%-----#------ not opposite to each other.
In option 3
So, @ is opposite to %,
& is opposite to # and
$ is opposite to G

19. Option (3) is correct.

Explanation:

Are you ready → 5 4 1

We are going → 2 6 1

She is ready → 4 9 8

The data can be represented as follows:

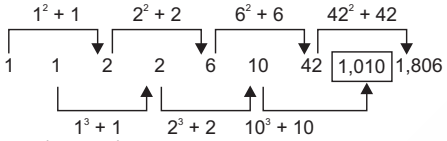
Code	Word
are	1
ready	4
You	5

Hence, 'you' will be coded as '5'.

20. Option (3) is correct.

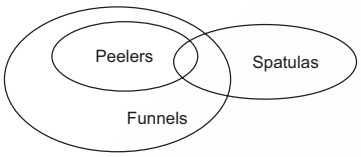
Explanation: Given series:
1, 1, 2, 2, 6, 10, 42, ?, 1,806

Logic:
$10^3 + 10 = 1010$



21. Option (2) is correct.

Explanation:



(1) Some peelers are not funnels -Does not follow (As all peelers are funnels. So, some peelers are not funnels is not true.)

(2) Some spatulas are peelers -Follow (As all peelers are funnels and some peelers are spatulas. So, some spatulas are peelers is definitely true.

22. Option (2) is correct.

Explanation:

Table of Alphabetical series (point to remember)

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14

Now,

E	+1 gives	F	+3	I	+5	N	+7	U	+9	D
5		6		9		14		21		4

23. Option (2) is correct.

Explanation:

Table of Alphabetical series (point to remember)

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14

Now,

E	opposite	Y	A	+5	F
5		22	1		6

C	opposite	X	B	+6	H
3		24	2		8

T	opposite	G	L	+5	Q
20		7	12		17

K	opposite	P	U	+5	Z
11		16	21		26

24. Option (3) is correct.

Explanation:

Table of Alphabetical series (point to remember)

Alphabets	A	B	C	D	E	F	G	H	I	J	K	L	M
Positional value	1	2	3	4	5	6	7	8	9	10	11	12	13
Alphabets	Z	Y	X	W	V	U	T	S	R	Q	P	O	N
Positional value	26	25	24	23	22	21	20	19	18	17	16	15	14

CALI, ZEGO, WIBU, TMWA, ?

C	-3 gives	Z	-3	W	-3	T	-3	Q
3		26		23		20		17

A	+4 gives	E	+4	I	+4	M	+4	Q
1		5		9		13		17

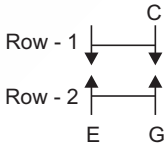
L	-5 gives	G	-5	B	-5	W	-5	R
12		7		2		23		18

I	Vowal	O	vowal	U	vowal	A	vowal	E
9		15		21		1		5

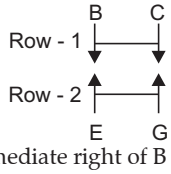
25. Option (1) is correct.

Explanation:

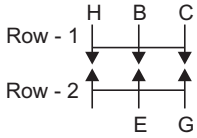
(1) E is to the immediate left of G and C is facing G



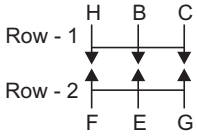
(2) B is to the immediate right of the person who is facing G



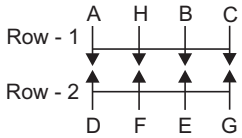
(3) H is to the immediate right of B



(4) F is facing H



(5) D is to the immediate left of F and A is facing D



Therefore, 'A B C H' are sitting in the same line.

General Awareness

26. Option (1) is correct.

Sri Akal Takht is located in the campus of Golden temple. It is one of the five takhts of Sikhs. It is located in the Golden temple complex, Amritsar, Punjab. The other two takhts are located in Shri Keshgarh Sahib in Anandpur and Shri Damdama Sahib at Talwandi Saboo in Bathinda.

The remaining two takhts are not in Punjab. They are Takht Shri Patna Sahib in Patna and Takht Shri Hazoor Sahib at Nanded in Maharashtra.

Takhts is a seat of authority and is spiritual in nature and takhts have special significance in the Sikh community.

27. Option (2) is correct.

As of April 2021, Deepti Sharma held the record for the highest individual Women's ODI cricket score by an Indian player. She achieved a score of 188 for 160 balls. She achieved this feat during a match against Ireland at Senwes Park, South Africa.

28. Option (2) is correct.

The Fiscal Responsibility and Budget Management Act 2003 set a target to limit India's fiscal deficit up to 3% of the GDP by 2021. Also, the government is required to limit debt of the central government to 40% of the GDP by the year 2024–25. This was done in accordance with the recommendations of NK Singh committee that was set up by the government to review the FRBM Act in the year 2016.

29. Option (4) is correct.

The dancer balances pot of burning diyas on his head in the Chari dance. This is one of the most popular folk dances of Rajasthan. In this, women hold pots on their heads and a lighted lamp is placed on the pot. It is done exclusively by women of Gujjar community of Kishangarh and is also a kind of welcome dance.

Dhangari Gaja dance is a folk dance of Maharashtra and is performed in traditional Marathi dress. This dance form belongs to shepherds, cowherds, buffalo keepers, and blanket weavers of Sholapur district, Maharashtra.

Koli is a popular folk dance of Maharashtra that is performed by fishermen of Koli caste. It depicts the lifestyle of fishermen.

Tamasha is a folk dance of Maharashtra which involves singing and dancing. It is performed by local or travelling theatre groups.

30. Option (4) is correct.

Naomi Osaka was the Australian Open Women's Singles champion in 2021. She defeated Jennifer Brady in the final, 6 – 4, 6 – 3 to win the women's singles tennis title at the 2021 Australian Open. It was her second Australian Open title and fourth major title overall.

Australian open is an annual tennis tournament held at Melbourne Park in Melbourne, Australia. It is one of the four grand slams that happen in a year. The other three are French Open, Wimbledon, and the US open.

31. Option (4) is correct.

Adar Poonawalla launched the Clean City initiative in Pune in the year 2015. This was launched with the purpose of improving the waste and environment management in Pune. He pledged to fund 100 crores towards this initiative.

Adar Poonawalla is the CEO of Serum Institute of India (SII). SII is the world's largest manufacturers of vaccine. It is headquartered in Pune and was founded by Cyrus Poonawalla in 1966.

32. Option (1) is correct.

Ammu Swaminathan became a part of the Constituent Assembly from Madras Constituency in 1946. She was an Indian political activist and social worker.

Hansa Jivraj Mehta was a social activist, educator, feminist, and writer in India.

Kamla Chaudhry was an Indian story writer in Hindi language. She was a freedom fighter and one of the 15 women who were a part of the Constituent Assembly.

Begum Aijaz Rasul was the only Muslim woman in the Constituent Assembly of India.

The Constituent Assembly was elected by the Provincial Assembly to frame the Constitution of India and this idea was first proposed by M. N. Roy in December 1934. The members of this assembly served as the nation's first Parliament as the 'Provisional Parliament of India'. The constituent assembly was formed on 9 December 1946 under the leadership of Rajendra Prasad with a total of 389 members. A total of 22 committees were created to deal with different tasks of constitution-making. There were 15 women who were a part of the Constituent Assembly.

33. Option (2) is correct.

Solids like fats, grease and oil that float on top of liquid wastewater is called sludge. The sludge is removed using the method of skimming. Generally, there is a skimming tank where the water is made to flow through partitions or baffles and from the surface, sludge is removed.

Urea is the most important nitrogenous fertiliser as it has Nitrogen content as high as 46%. Nitrogen is an essential nutrient for the growth and development of crops.

Compost is a mixture of ingredients that are used to improve the fertility of soil by improving its physical, chemical, and biological properties.

Peat contains 20–30% of carbon content. It has a lot of moisture and burns like wood to give less heat, emits more smoke and leaves a lot of ash. As It is the first stage in the formation of coal, it consists of partly decayed plants and animals.

34. Option (3) is correct.

Give me blood and I will give you freedom was quoted by Subhash Chandra Bose. Bose was fondly called as Neta Ji. He had a quantifiable role in Indian Independence movement. Some of his famous slogans were - Jai Hind, Delhi Chalo. He was the founder of Azad Hind Fauj. His birth anniversary is officially known as Parakram Diwas and is celebrated on 23 January every year.

'Live as if you were to die tomorrow. Learn as if you were to live forever' was given by Mahatama Gandhi.

'The best way to find yourself is to lose yourself in the service of others' was given by Mahatama Gandhi.

'First, they ignore you, then they laugh at you, then they fight you, then you win' was given by Mahatma Gandhi.

35. Option (3) is correct.

In order to get clean drinking water disinfectant is used after filtration. Disinfectant, however, is NOT used for removing minerals. Disinfection is done in order to eliminate pathogens such as bacterias, viruses, and parasites responsible for waterborne diseases. The two major disinfectants used in water are chlorine and chloramine. Chlorine breaks the chemical bonds in the molecules.

Water can be disinfected using heat, ultraviolet (UV) radiation, adding chemicals, and filtration.

36. Option (1) is correct.

Gnomon is a part of solar clock. It is that part of sundial which casts shadow and is probably the world's oldest astronomical instrument. It can be a rod, wire, or decorated metal casting that has to be parallel to the axis of Earth's rotation for sundial to be accurate.

A transformer is a device that transfers electrical energy from one electric circuit to the other. It uses the process of electromagnetic induction and is used to increase or decrease voltage between circuits.

Bolometer is a device used to measure radiant heat with a temperature dependent electrical resistance. It was invented by astronomer Samuel Pierpont Langley.

Binoculars is a handheld optical instrument that provides magnified stereoscopic view of distant objects.

37. Option (1) is correct.

The Vernacular Press Act of 1878 was repealed during the tenure of Viceroy Lord Ripon. Vernacular Press Act was enacted to limit the freedom of Indian press. This act was proposed by Lytton, the then viceroy of India. This act intended to provide a better control of the vernacular press. It intended to suppress, punish and repress 'seditious writing' in 'publications in oriental languages.' It is also known as 'The Gagging act.' Under the provisions of this act, there was discrimination between English and vernacular press and there was no right to appeal with the vernacular press.

38. Option (2) is correct.

Nalini Malani won the 'Joan Miro Prize' for the year 2019. Nalini is an Indian artist. This award is named after Spanish painter and sculptor Joan Miro. It is an international award for an artist at a breakthrough stage in his/her career regardless of age, gender or cultural identity. It is awarded by Stavros Niarchos Foundation (SNF).

39. Option (1) is correct.

Red Laterite soil is more suitable than the others for the growth of cashew nut. Red laterite soil is formed due to weathering of laterite rocks. Laterite soils are rich in iron and aluminium content and red color is due to high iron oxide content. It is used for growing coffee, tea, rubber, coconut, cinchona.

Black cotton soil is also known as Regur soil and is formed by degradation of basalt. The black colour is due to the presence of titaniferous magnetite. It is rich is calcium, carbonate, potash. However, it is low in phosphorous, nitrogen, and organic matter.

Alluvial soil is formed by the sentiments deposited by the river. It is rich in Potash and poor in nitrogen and organic matter. It is most suitable for maize, wheat, rice, pulses, and sugarcane.

Arid soil is also known as desert soil. It is brown and red in colour. It has high concentrations of gypsum, calcium carbonates, and sodium. Generally, it is not very suitable for the majority of crop production.

40. Option (3) is correct.

Rupnath is NOT a find spot of Ashokan Minor Rock Edicts in Karnataka. Rupanth inscription is near Kaimur Hills, Jabalpur, Madhya Pradesh. The Ashokan inscriptions or rock edicts are the first tangible evidence of Buddhism. There are 33 inscriptions in all which can be classified as:

I. Major rock edicts
II. Minor rock edicts
III. Separate rock edicts
IV. Major pillar edicts
V. Minor pillar edicts

There are 15 minor rock edicts spread across India and Afghanistan. However, Ashoka uses his name only in four places namely- Maski, Brahmagiri (Karnataka), Gujjara (MP) and Nettur (AP).

41. Option (2) is correct.

Under the National Urban Sanitation Policy, a city that scores points between 34 and 66 and needs considerable improvement is colour-coded black. There are four color codes and the rankings are based on 19 sanitation parameters such as access to community toilets, safe management of human excreta, and solid waste collection and treatment. The four color codes are Red, black, blue, and green.

Red means cities need 'immediate remedial action' and it has points less than 33.

Black means 'need considerable improvement' and it has points between 34 to 66.

Blue means 'recovering' and it has points between 67 to 90.

Green means 'healthy and clean city' and it has points between 91 to 100.

This scheme was launched by Ministry of Urban Development (MoUD) and every year if the city improves its ratings it will be awarded Nirmal Shahar Puraskar.

42. Option (2) is correct.

According to the Hindu marriage Act, 1955, Saptapadi Ritual considers marriage to be complete and auspicious. According to the section 7(2) of Hindu marriage Act, 1955, in the Saptapadi ceremony marriage will be considered complete and valid upon completion of the seventh round around the holy fire by both bride and groom. Circles basically represents seven principles and promises that both of them make to each other.

43. Option (3) is correct.

The Government of India imposed an Agriculture and Infrastructure Development Cess of 2.5 per litre on petrol through Union Budget 2021-22. Cess is a tax which is levied by the government over and above the base tax being paid by the taxpayer. This is generally done to raise funds for specific purpose. For example, government levies education cess to fund the free primary education. It is discontinued when the purpose of the tax collection is fulfilled. It can be levied on both indirect and direct taxes.

44. Option (3) is correct.

Srikant Datar was named as Dean of Harvard Business School in October 2020. He is an Indian American economist. He was awarded Padma Shri which is the fourth highest civilian award of the country.

45. Option (3) is correct.

74th Constitutional Amendment Act (CAA), 1992 was enacted in 1993 to constitutionally recognise municipal governments. There was decentralisation of powers and authorities to Urban Local Bodies (ULB) at various levels.

The 73rd Amendment of the Constitution of India envisages the Gram Sabha as the foundation of the Panchayat Raj System to perform functions and powers entrusted to it by the State Legislatures. This was enacted in the year 1992 to improve local self-governance. It lead to the establishment of a three tier panchayati raj system at the village, intermediate, and district levels.

The 71st amendment to the Indian constitution led to the inclusion of Konkani, Manipuri, and Nepali languages to the languages in the eighth schedule. This increased the number of scheduled languages to 18.

The 72nd amendment of the Indian Constitution provided temporary provision for determining the number of seats reserved for Schedule Caste and Tribe in Tripura state assembly until the seats were readjusted on the basis of first census after the year 2000.

46. Option (1) is correct.

The Annapurna peak belongs to Nepal region of the Himalayas. It is the tenth highest mountain in the world with a height of 8091 meters and is a part of Gandaki Province, Nepal. It is named after the Hindu Goddess of food and nourishment- Annapurna.

47. Option (1) is correct.

As per WHO, Titania is not an example of disinfection by-products formed at traditional drinking water treatment plants. The by-products formed at traditional drinking water treatment plants are bromate, chlorite, and chlorite. However, Titanium dioxide is the most frequently used photocatalyst for water purification. It is relatively cheap and abundant. It is non-toxic, insoluble in water and resistant to most chemicals, such as acids, bases or solvents.

48. Option (1) is correct.

The picture that won the World Press Photo of the Year 2021 contest is titled 'The First Embrace.' In the winning image, Rosa Luzia Lunardi (85) is embraced by nurse Adriana Silva da Costa Souza, at Viva Bem care home, Sao Paulo, Brazil, on 5 August 2020.

49. Option (4) is correct.

Haryana has the lowest female sex ratio according to the 2011 Census. Population Census is the total process of

collecting, compiling, analysing, evaluating, publishing and disseminating statistical data regarding the population and housing and their geographical location.

The census is conducted by Office of the Registrar General and Census Commissioner of India, Ministry of Home Affairs, Government of India.

Census is conducted every 10 years under the provisions of the Census Act, 1948. It comes under Article 246 of the Indian constitution. It is a Union subject and is listed at serial number 69 of the seventh schedule of the constitution.

50. Option (1) is correct.

CD Deshmukh was the first Indian Governor of Reserve Bank of India. However, the Sir Osborne Smith was the first Governor of the Reserve Bank.

RBI was established on the recommendations of Hilton Young Committee. It was founded on 1st April 1935 in Kolkata. It is headquartered in Mumbai and is under the ownership of Ministry of Finance, Government of India. RBI is India's central bank and is the regulator of India's banking system. It has one governor and four deputy governors.

The bank's current governor is Shaktikanta Das.

Quantitative Aptitude

51. Option (4) is correct.

Shopkeeper has bought toffees at a rate of 10 for ₹15

Later he sold them at a rate of 16 for ₹40

We know that Profit% $= \frac{SP - CP}{CP} \times 100\%$

As per the problem,

	Quantity	Rate	
CP	10	15	Eqn…(i)
SP	16	40	Eqn…(ii)

Quantity same

Multiply by 8 in equation 1, and multiply by 5 in equation 2

	Quantity	Rate
CP	80	120
SP	80	200

CP of 80 toffees is 120, and SP is 200

So, the profit percentage $= \frac{200-120}{120} \times 100\%$

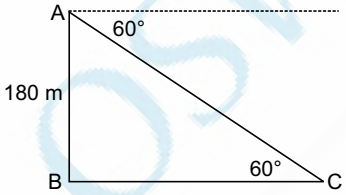
Profit percentage = 66.67%

52. Option (2) is correct.

Height of ship = 180 m

Angle of depression from ship to boat = 60°

Let us make figure on the basis given information.



In ΔABC

$$\tan 60° = \frac{AB}{BC}$$

$$\Rightarrow \quad \sqrt{3} = \frac{180}{BC}$$

$$\Rightarrow \text{ BC} = \frac{180}{\sqrt{3}} = \frac{180\sqrt{3}}{3} = 60\sqrt{3}$$

Distance of boat from the ship $= 60\sqrt{3}$ m

53. Option (2) is correct.

$$\frac{4\frac{1}{3}+3\frac{1}{3}\times 1\frac{4}{5}\div 3\frac{3}{4}\times\left(6\frac{1}{4}\text{ of }1\frac{1}{15}\right)}{\frac{2}{3}\div\frac{5}{6}\times\frac{2}{3}}$$

Using BODMAS

$$= \frac{4\frac{1}{3}+3\frac{1}{3}\times 1\frac{4}{5}\div 3\frac{3}{4}\times\left(6\frac{1}{4}\text{ of }1\frac{1}{15}\right)}{\frac{2}{3}\div\frac{5}{6}\times\frac{2}{3}}$$

$$= \frac{\frac{13}{3}+\frac{10}{3}\times\left(\frac{9}{5}\times\frac{4}{15}\right)\times\left(\frac{25}{4}\times\frac{16}{15}\right)}{\frac{2}{3}\times\frac{6}{5}\times\frac{2}{3}}$$

$$= \frac{\frac{13}{3}+\frac{10}{3}\times\frac{12}{25}\times\frac{20}{3}}{\frac{8}{15}}$$

$$= \frac{\frac{13}{3}+\frac{32}{3}}{\frac{8}{15}} = \frac{\frac{45}{3}}{\frac{8}{15}} = \frac{45}{3}\times\frac{15}{8} = \frac{225}{8} = 28\frac{1}{8}$$

54. Option (1) is correct.

We need to find the smallest number which should be added to the smallest number divisible by 6, 9 & 15 to make number a perfect square.

As per the question,

LCM of (6,9 and 15) = 90

If we add 10 to 90

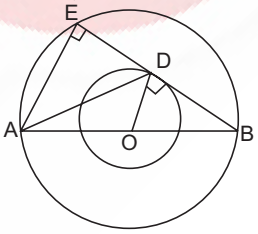
$\Rightarrow$ 90 + 10 = 100

$\Rightarrow$ 100 is the perfect square number.

So, 10 is the smallest number required.

55. Option (4) is correct.

As per the given data, we can have the following figure.



Since, OA = OB = 26 cm (radii of bigger circle)

OD = 16 cm (radius of smaller circle)

AE = 2 × OD = 2 × 16 = 32 cm

In ΔODB,

$OB^2 = OD^2 + BD^2$ (By Pythagoras theorem)

$\Rightarrow \quad BD^2 = OB^2 - OD^2$

$\Rightarrow \quad BD^2 = 26^2 - 16^2 = 420$

$\Rightarrow \quad BD = DE = \sqrt{420}$ cm

In ΔAED,

$AD^2 = DE^2 + AE^2$

$\Rightarrow \quad AD^2 = \left(\sqrt{420}\right)^2 + 32^2 = 420 + 1{,}024 = 1{,}444$

AD = 38 cm

56. Option (2) is correct.

We need to find sum of the greatest and the smallest number that may replace *k* in 3281*k*6.

3281*k*6 is divisible by 6

When number is divisible by 6 then it is also divisible by 2 and 3.

Last number should be even so the number is divisible by 2.
For divisibility by 3
$= 3 + 2 + 8 + 1 + k + 6 = 20 + k$
Take $k = 1$ (minimum)
$20+1 = 21$ divisible by 3
Take $k = 7$ (maximum)
$\Rightarrow$ $20 + 7 = 27$ divisible by 3
Sum = minimum + maximum = 1 + 7 = 8
So, sum of the greatest and the smallest number is 8.

57. Option (3) is correct.
Given that successive discounts of 20% and 35%.
C.P. = ₹ 4,580
Successive discount

$$= 20+35-\frac{20\times35}{100} = 55-7 = 48\%$$

As per the question,

$$\text{S.P.} = 4,580\times\frac{100-48}{100}$$

$$= 4,580\times\frac{52}{100} = 2,381.6 \cong ₹\ 2,382$$

So, the final S.P. (in nearest rupee) is ₹ 2,382.

58. Option (1) is correct.

$$5x-\frac{1}{4x} = 6 \quad \ldots(i); \quad [x > 0]$$

Squaring both sides

$$\left(5x-\frac{1}{4x}\right)^2 = 6^2$$

$$\Rightarrow \quad 25x^2+\frac{1}{16x^2}-2\times5x\times\frac{1}{4x} = 36$$

[Using $(a-b)^2 = a^2 + b^2 - 2ab$]

$$\Rightarrow \quad 25x^2+\frac{1}{16x^2} = 2\times5x\times\frac{1}{4x}+36 = \frac{5}{2}+36$$

$$= \frac{5+72}{2} = \frac{77}{2}$$

Now, $\left(5x+\frac{1}{4x}\right)^2 = 25x^2+\frac{1}{16x^2}+2\times5x\times\frac{1}{4x}$

$$= \frac{77}{2}+\frac{5}{2} = 41$$

$$\Rightarrow \quad 5x+\frac{1}{4x} = \sqrt{41} \quad \ldots(ii)$$

$$\left(5x-\frac{1}{4x}\right)\left(5x+\frac{1}{4x}\right) = 6\times\sqrt{41} \quad [\text{Using (i) \& (ii)}]$$

$$25x^2-\frac{1}{16x^2} = 6\sqrt{41}$$

59. Option (3) is correct.
In ΔABC, the bisector of angle ∠BAC meets BC at D such that
AB = 10 cm, AC = 15 cm and BD = 6 cm.
By using Angle bisector theorem: If bisector of A is ΔABC meets BC in D.

Then, $\frac{DC}{BD} = \frac{AC}{AB}$

$\Rightarrow$ $\frac{DC}{BD} = \frac{AC}{AB}$

$\Rightarrow$ $\frac{DC}{BD} = \frac{15x}{10x}$

$\Rightarrow$ $\frac{DC}{6} = \frac{15}{10}$

$\Rightarrow$ DC = 9 cm
BC = BD + DC
$\Rightarrow$ BC = 6 + 9 = 15 cm
So, length of BC (in cm) is 15.

60. Option (1) is correct.
Given that A & B working alone can finish a work in 8 days and 12 days, respectively.
They both started working together, later A left 2 days before the completion of the work.
Since we know that efficiency = $\frac{\text{Work}}{\text{Day}}$
A = 8 days, B = 12 days
Total work = LCM of (8,12) = 24

Efficiency of A = $\frac{24}{8} = 3$

Efficiency of B = $\frac{24}{12} = 2$

Last 2 days work done by B.
Last 2 days work = 2 × 2 = 4
Remaining work = 24 – 4 = 20
$\Rightarrow$ Work done by (A + B) in one day = 3 + 2 = 5
so, total number of days taken to complete the work

$\Rightarrow$ $\frac{20}{5}+2 = 6$

So, work completed was 6 days.

61. Option (2) is correct.
Given that A started a business by investing ₹ 65,000.
After a few months, B joined him by investing ₹ 50,000.
3 months after the joining of B, C joined the two with an investment of ₹ 55,000.
A got 50% of profit as his share.
Profit ratio = $\text{Investment}_1 \times \text{Time}_1 : \text{Investment}_2 \times \text{Time}_2 : \ldots \text{Investment}_n \times \text{Time}_n$
Let us assume that B invest the amount after x months
A invest for 12 months and B invest for $(12 - x)$ months.
3 months after the joining of B, C joined the A & B with an investment of ₹ 55,000.
So, C invest for $(12 - x - 3) = (9 - x)$ months
Profit share = A : B : C
Profit share = 65,000 × 12 : 50,000 × $(12 - x)$: 55,000 × $(9 - x)$
= 156 : 10$(12 - x)$: 11$(9 - x)$
A got 50% of profit as his share.

$\Rightarrow$ $\frac{156}{156+120-10x+99-11x} = \frac{1}{2}$

$312 = 375 - 21x$
$\Rightarrow$ $21x = 63$
$\Rightarrow$ $x = 3$ month
So, A alone finance the business for period of three month.

62. Option (3) is correct.
As per the given data, we will find the profit of each year.

Years	Receipts	Expenditure	Gain = Receipts – Expenditure
2016	54	51	54 – 51 = 3
2017	64	60	64 – 60 = 4
2018	80	75	80 – 75 = 5
2019	82	80	82 – 80 = 2
2020	93	87	93 – 87 = 6

Clearly, the lowest gain is ₹ 2 lakh for year 2019.

63. Option (4) is correct.

Let us assume that the numbers be $2x$, $3x$, $4x$.

According to question,

$\Rightarrow \quad 4x^2 + 9x^2 + 16x^2 = 2,349$

$\Rightarrow \quad 29x^2 = 2,349$

$\Rightarrow \quad x = \sqrt{\frac{2,349}{29}} = 9$

$\Rightarrow$ Two numbers : $2x = 18, 3x = 27$

$\Rightarrow$ The average of the first two numbers $\frac{18+27}{2} = 22.5$

So, average of the first 2 numbers is 22.5.

64. Option (1) is correct.

Given that sides of a triangular field are 360 m, 480 m & 600 m and area is equal to the area of a square field.

Triplet of triangle = (360 m, 480 m, and 600 m)

$\Rightarrow \quad (600)^2 = (360)^2 + (480)^2$

$= 1,29,600 + 2,30,400 = 3,60,000$

By converse of Pythagoras theorem, the given triangle is right angled triangle.

So, height = 480 and base = 360, and 600 = Hypotenuse

Area of triangle $= \frac{1}{2}(360 \times 480) = 86,400 \text{ m}^2$

According to the problem,

Its area is equal to the area of a square field.

$\Rightarrow \quad \text{side}^2 = 86,400$

$\Rightarrow \quad \text{side} = 120\sqrt{6} \text{ m}$

So, the side (in m) of the square field is $120\sqrt{6}$ m.

65. Option (4) is correct.

Given that:

First salary decreased by 50%

Then after increased by 50%

By using successive percentage change $= x + y + \frac{xy}{100}$

So, Required percentage change $= -50 + 50 + \frac{(-50)(+50)}{100}$

$= 0 - 25 = -25\%$

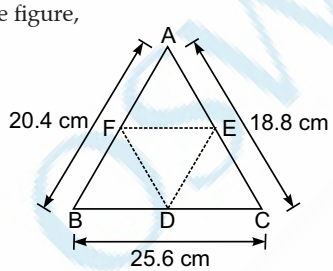
So, there is a decrease of 25%.

66. Option (3) is correct.

Given that in ΔABC, D, E, and F are the mid-points of side BC, CA, and AB respectively.

BC = 25.6 cm, CA = 18.8 cm & AB = 20.4 cm

Let's make figure,



E & F are the mid-point of the side AC and AB.

$AE = EC \quad \text{and} \quad AF = FD$

$\Rightarrow \quad \frac{AE}{EC} = \frac{AF}{FB}$ (By BPT)

Also, By mid-point theorem

$\Rightarrow \quad EF = \frac{BC}{2} = \frac{25.6}{2} = 12.8 \text{ cm}$

Similarly,

$DE = \frac{AB}{2} = \frac{20.4}{2} = 10.2 \text{ cm}$

$FD = \frac{AC}{2} = \frac{18.8}{2} = 9.4 \text{ cm}$

So, perimeter (in cm) of the ΔDEF = DE + EF + FD

= 10.2 + 12.8 + 9.4 = 32.4 cm

67. Option (4) is correct.

$$\frac{(7.03)^3 - 0.027}{(7.03)^2 + 2.109 + (0.3)^2} = \frac{(7.03)^3 - (0.3)^3}{(7.03)^2 + 2.109 + (0.3)^2}$$

$$= \frac{(7.03 - 0.3)[(7.03)^2 + 2.109 + (0.3)^2]}{(7.03)^2 + 2.109 + (0.3)^2}$$

$\{\text{using, } a^3 - b^3 = (a-b)(a^2 + ab + b^2)\} = 7.03 - 0.3 = 6.73$

68. Option (2) is correct.

Given that Anil lent a sum of ₹ 5,000 on simple interest for 10 years.

Rate of interest = 6% for first 2 years, 8% for next 2 years, and 10% per annum by 4 years

Interest earn (10 years) = 6% for 2 years + 8% for next 2 year + 10% for further 6 years

$\Rightarrow$ Interest earn = $6 \times 2 + 8 \times 2 + 10 \times 6$

$\Rightarrow$ Interest earn = 12% + 16% + 60%

$\Rightarrow$ Interest earn = 88%

$\Rightarrow$ 88% of 5,000 $= 88 \times \frac{5,000}{100} = 4,400.$

So, Anil earns interest at the end of 10 years is ₹ 4400.

69. Option (1) is correct.

Total no. of employees = ₹ 2,400.

If 40% of the no. of employees in office A are shifted equally to offices B & E.

40% of the no. of employees in office A

$= \left(\frac{126}{360}\right) \times \left(\frac{40}{100}\right) \times 2,400 = 336 \text{ A} = \frac{336}{2}$

= 168 are shifted equally to offices B and E

Initial number of employee in office B $= 2,400 \times \left(\frac{18}{360}\right) = 120$

Now, $120 + 168 = 288$

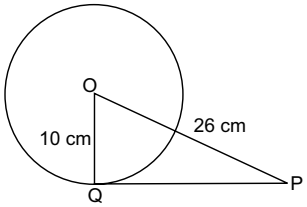
Number of employee in office C $= 2,400 \times \frac{54}{360} = 360$

Sum of the number of employees in B and C = 288 + 360 = 648

So, sum of the no. of employees in B and C will be 648.

70. Option (4) is correct.

Given that O is the centre of a circle of radius 10 cm and P is point outside the circle and PQ is a tangent to the circle.



71. Option (2) is correct.

$$\frac{8 \sin A + 11 \operatorname{cosec} A - \cot^2 A}{10 \cos 2A}$$

Since, A = 30°

So, $\frac{8 \sin 30° + 11 \operatorname{cosec} 30° - \cot^2 30°}{10 \cos 60°}$

$= \frac{8 \times \frac{1}{2} + 11 \times 2 - \left(\sqrt{3}\right)^2}{10 \times \frac{1}{2}} = \frac{4 + 22 - 3}{5} = \frac{23}{5} = 4\frac{3}{5}$

72. Option (2) is correct.

Relative speed of the two trains = 75 + 85 = 160 km/h

Distance travelled in 3 min $= \frac{3}{60} \times 160 = 8$ km

So, the distance between trains = 8 km

73. Option (1) is correct.

From the given bar graph.

Marks	Number of student
0 – 5	2
5 – 10	8
10 – 15	7
15 – 20	8
20 – 25	10
25 – 30	5

Student must score a minimum of 10 marks to pass the test.

No. of students scored minimum 10 marks to pass the test 7, 8, 10 and 5 =7 +8 +10+5 = 30

$$\text{Percentage} = \left(\frac{\text{Number of student scored 10 marks minimum}}{\text{Total number of student}}\right) \times 100$$

$$= \left(\frac{30}{40}\right) \times 100 = 75\%$$

So, required percentage of students who passed the test is 75%.

74. Option (2) is correct.

The no. of students getting grade B is 27% and no. of students getting grade A is 30%

According to the question,

$$\text{Percentage} = \left(\frac{\text{given value}}{\text{base value}}\right) \times 100$$

$$\Rightarrow \quad \text{Percentage} = \left(\frac{\text{grade } B \text{ is } 27\%}{\text{grade } A \text{ is } 30\%}\right) \times 100$$

$$\Rightarrow \quad \text{Percentage} = \left(\frac{27}{30}\right) \times 100 = 90\%$$

75. Option (4) is correct.

$$(2\cos A + 1)(2\cos A - 1) = 0$$

$$\Rightarrow \quad (4\cos^2 A - 1) = 0$$

$$\Rightarrow \quad 4\cos^2 A = 1$$

$$\Rightarrow \quad \cos^2 A = \frac{1}{4}$$

$$\Rightarrow \quad \cos A = \sqrt{\frac{1}{4}} = \frac{1}{2} \qquad (\text{Since, } 0° < A < 90°)$$

We know that, $\cos 60° = \frac{1}{2}$

So, A = 60°

English Comprehension

76. Option (2) is correct.

The sentence is clearly an interrogative sentence. The word order in a question is question word + auxiliary verb + subject + main verb (according to the tense).

(1) The auxiliary verb is missing in this option.

(2) It has the correct word order for a question.

(3) The auxiliary verb should be before the subject. Also, it uses the past tense, while the 'if clause' is in present simple. Moreover, 'give' is a transitive verb, which means an object is required here.

(4) The auxiliary verb should be before the subject and not after. Also, being a transitive verb, 'give' requires an object, which is missing in this option.

77. Option (1) is correct.

(1) 'Centenarian' is a person who is hundred or more than 100 years old.

(2) 'Venerable' means respected or worshipped.

(3) 'Aged' means very old.

(4) 'Geriatric' refers to an old person who is receiving special care.

78. Option (3) is correct.

'Frenzy' is a state or period of uncontrolled excitement or wild behaviour.

(1) 'Craze' means an enthusiasm for a particular activity or object which appears suddenly and achieves widespread but short-lived popularity.

(2) 'Rage' is violent uncontrollable anger.

(3) 'Calm' means not showing or feeling nervous-ness, anger, or other strong emotions.

It is the closest antonym of the given word.

(4) 'Fury' is wild or violent anger.

79. Option (3) is correct.

The blank needs a word of which emergency windows is an example.

(1) 'Types' is a category of people or things having common characteristics.

(2) 'Qualities' is the standard of something as measured against other things of a similar kind

(3) 'Features' a distinctive attribute or aspect of something.

(4) 'Pieces' is a portion of an object or of material, produced by cutting, tearing, or breaking the whole.

80. Option (1) is correct.

Either 'said to' or 'told' is used as a reporting verb. Simple past tense changes to past perfect tense. Also, the first person pronoun is changed according to the subject pronoun of the reporting verb, and the second person pronoun is changed according to the object pronoun of the reporting verb.

(1) The reporting verb, tense and pronouns are correct.

(2) The reported speech in this option is in past simple, while it should be in past perfect tense.

(3) The reported speech in this option is in past continuous tense, while it should be in past perfect tense. Also, it has the wrong object pronoun.

(4) The reported speech in this option is in past simple tense, while it should be in past perfect tense. Also, it has the wrong object pronoun.

81. Option (2) is correct.

'To hit a brick wall' is to face an insuperable problem or obstacle while trying to do something.

82. Option (2) is correct.

'To sit on the fence' is to avoid making a decision or choice.

83. Option (4) is correct.

(1) 'Numismatist' is someone who studies or collects coins, paper money, or medals

(2) 'Hoarder' is a person who hoards or gathers things regardless of their actual value.

(3) 'Collector' is a person who collects things of a specified type, professionally or as a hobby.

(4) 'Philatelist' is a person who studies or collects postage stamps as a hobby or investment.

84. Option (3) is correct.

The subject of the passive sentence becomes the object of the active sentence. Also, the tense of the sentence is not changed.

(1) 'Rishabh' should be the object and not the subject of the active sentence.

(2) This option is in future tense.

(3) This option and the original sentence are in past simple. Also, 'Rishabh' is the object of this option.
(4) This option is in past perfect tense while the original sentence is in past simple tense.

85. Option (2) is correct.

'Whom' is an object pronoun. We need a subject pronoun, who, here.

86. Option (4) is correct.

Sentence D talks of an effect, which is evident by the word 'so'. It talks of Gandhiji visiting Motihari to protest against the British. Amongst the remaining sentences, the only sentence that gives the cause is sentence A. This makes AD a mandatory pair. So, we can eliminate options (2) and (3). Now, the mandatory pair should be followed by sentence B as it mentions what happened after Gandhiji reached Motihari: Gandhiji living in the district till the exploitation stopped. The remaining sentence C should come before sentence A as it introduces the 'area', which is mentioned in sentence A. So, the correct sequence is CADB.

87. Option (2) is correct.

'Bited' is not grammatically correct. The sentence is in passive form, and the past simple passive is formed by using 'was/were' + past participle. So, the correct phrase will be 'bitten by a dog'.

88. Option (2) is correct.

If both you and I have submitted the work, then the work cannot belong to one person. So, the error is in option (2), making it the correct answer. The correct phrase will be 'our work'.

89. Option (1) is correct.

The phrase 'at the earliest' means not before the time or date specified. So, option (3) has an error.

90. Option (3) is correct.

(1) 'Voluntary' means done, given, or acting of one's own free will.
(2) 'Disparity' is difference in level or treatment, especially one that is seen as unfair.
(3) The correct spelling of the word is 'continuance', which means the state of remaining in existence or operation.
(4) 'Convincing' means capable of causing someone to believe that something is true or real.

91. Option (2) is correct.

'Honest' means truthful and sincere.
(1) 'Secretive' means inclined to conceal feelings and intentions or not to disclose information.
(2) 'Sincere' means proceeding from genuine feelings. It is the synonym of the given word.
(3) 'Daring' means adventurous or audaciously bold.
(4) 'Strange' means difficult to understand or explain.

92. Option (4) is correct.

The sentence has the double negative error. The sentence already has a negative verb. So, we cannot use 'neither'. So, option (4) has an error. The correct phrase should be 'buy either'.

93. Option (3) is correct.

The subject and object of the active voice sentence are interchanged in passive voice sentence. The tense of the sentence remains the same, i.e., past simple.
(1) This option is in past continuous tense.
(2) This option is in present perfect tense.
(3) This option is in past simple tense.
(4) This option is in present simple tense.

94. Option (1) is correct.

'Graceful' means having or showing grace or elegance.
(1) 'Awkward' means not smooth or graceful. It is the correct antonym of the given word. So, option (1) is the correct answer.
(2) 'Dignified' means having or showing a composed or serious manner that is worthy of respect.
(3) 'Refined' means clarified or purified.
(4) 'Polite' means having or showing behaviour that is respectful and considerate of other people.

95. Option (3) is correct.

'Imbue' is to inspire or permeate with a feeling or quality.
(1) 'Remove' is to take something away or off from the position occupied.
(2) 'Clear' means easy to perceive, understand, or interpret.
(3) 'Instil' means to gradually but firmly establish an idea or attitude in a person's mind. It is the synonym of the given word.
(4) 'Deprive' is to prevent a person or place from having or using something.

96. Option (4) is correct.

The blank needs an adjective for the word 'changes' which have a positive result.
(1) 'No' change would suggest there is no result.
(2) 'Slow' changes don't suggest a positive result.
(3) 'Ultimate' means final. It doesn't fit in the given context.
(4) 'Rapid' changes suggest that science and technology is up to date with the times. So, we can expect a positive result.

97. Option (3) is correct.

The sentence talks of management making employees accept the new technology.
(1) 'Dissuade' is to persuade someone not to take a particular course of action.
(2) 'Discourage' is to cause someone to lose confidence or enthusiasm.
(3) 'Persuade' is to induce someone to do something through reasoning or argument.
(4) 'Deactivate' is to make something inactive by disconnecting or destroying it.

98. Option (3) is correct.

The blank needs an adjective for 'training', which is necessary for employees to update their knowledge or stay updated.
(1) 'Intermittent' means not continuous or steady.
(2) 'Irregular' means not even or balanced in shape or arrangement.
(3) 'Regular' means arranged in or constituting a constant or definite pattern, especially with the same space between individual instances. It is the only positive option.
(4) 'Improper' means not in accordance with accepted standards, especially of morality or honesty.

99. Option (2) is correct.

The sentence talks of updating the employees' knowledge. So, we need a word which conveys the same meaning as updating the skills.
(1) 'Hamper' is to hinder or impede the movement or progress of something.
(2) 'Enhance' is to intensify, increase, or further improve the quality, value, or extent of.
(3) 'Imitate' is to take or follow as a model.
(4) 'Decrease' is to make or become smaller or fewer in size, amount, intensity, or degree.

100. Option (2) is correct.

We need a preposition here that would suggest that effective communication is used to update the employees' knowledge and skills.
(1) 'By' is used when we are talking about means or the agency of something.
(2) 'Through' means by way of a particular process.
(3) 'Throughout' means during the whole course or period.
(4) 'With' is used as a function word to indicate the means, cause, agent, or instrumentality.