SSC CHSL 2020 Official Paper 26 (Held on: 9 Aug 2021 Shift 2) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2020 • 100 questions • 60 minutes • Answer key and solutions

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ENGLISH LANGUAGE

Q1. Select the option that expresses the given sentence in direct speech.

The plumber told Ranjit that he had fixed the leaking tap

(a) The plumber told Ranjit, “Had he fixed the leaking tap?”
(b) The plumber said to Ranjit, “You had fix the leaking tap.”
(c) The plumber said to Ranjit, “I have fixed the leaking tap.”
(d) The plumber told to Ranjit, “He had fixed the leaking tap.”

Q2. Select the INCORRECTLY spelt word.

(a) Business
(b) Corporation
(c) Multinational
(d) Conglomarate

Q3. Select the option that can be used as a one-word substitute for the given group of words.

The nest of a squirrel, typically in the form of a mass of twigs in a tree

(a) Drey
(b) Hole
(c) Lair
(d) Burrow

Q4. Select the most appropriate meaning of the given idiom.

A fire in someone’s belly

(a) one who continues to work without wanting a reward
(b) one who comes from a middle class background
(c) one who is rich and powerful and exploits the poor
(d) one who is energetic and enthusiastic about something

Q5. Select the most appropriate synonym of the given word.

Allege

(a) Appease
(b) Soothe
(c) Placate
(d) Charge

Q6. Examine the four jumbled sentences. Out of the given options, pick the one that gives their correct order.

A. They can travel to the airport by personal vehicle or registered cabs only.
B. Finally, all passengers are advised to strictly follow social distancing markers.
C. According to the Government guidelines, air travel is declared open from May 2020 for passengers.
D. Once there, they can walk in through the Entry Gates, which shall be kept open.

(a) BCAD
(b) DCAB
(c) CADB
(d) ACBD

Q7. Select the most appropriate word to fill in the blank.

The kite was stuck so high on the tree that it was _____ the reach of the boys.

(a) below
(b) beyond
(c) beside
(d) beneath

Q8. Select the most appropriate ANTONYM of the given word.

DISJOINTED

(a) soft
(b) connected
(c) abrupt
(d) sharp

Q9. Select the correct passive form of the given sentence.

How much will they pay you?

(a) How much will you be paid by them?
(b) How much will they be paying?
(c) Payment will be done by them?
(d) They will have paid you how much?

Q10. The following sentence has been split into four segments. Identify the segment which contains a grammatical error.

He will be leaving / home at 8 a.m. / to beating / the office rush hour.

(a) to beating
(b) He will be leaving
(c) home at 8 a.m.
(d) the office rush hour

Q11. Select the most appropriate word to fill in the blank.

A good teacher is the one who can explain the most complex subjects in a _____ way.

(a) straightforward
(b) distracted
(c) lengthy
(d) roundabout

Q12. Select the most appropriate ANTONYM of the given word.

Drab

(a) Tiring
(b) Boring
(c) Bright
(d) Dry

Q13. Select the word which means the same as the group of words given.

A sentimental longing for a time in the past

(a) nostalgia
(b) myopia
(c) dystopia
(d) sepia

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Q14. Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the right order to form a meaningful and coherent paragraph.

A. That is why they are considered the best indoor plants to keep at homes and offices.

B. The indoor bonsai plants enhance the aesthetic appeal of the space and offer multiple health and psychological benefits.

C. Bonsai is an important part of Japanese culture dating back to the 14th century.

D. It is the art of cultivating small trees within a container that take the shape and scale of full-size trees.

(a) CDBA
(b) ABCD
(c) DCBA
(d) CBAD

Q15. 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'.

A heavy fine will be inflicted with them if they do not pay the taxes in time.

(a) No substitution required
(b) will be inflicted for them
(c) will be inflicted of them
(d) will be inflicted on them

Q16. Select the most appropriate synonym of the given word.

CLEAN

(a) talkative
(b) tall
(c) Shy
(d) honest

Q17. Select the INCORRECTLY spelt word.

(a) condemnation
(b) defamation
(c) conscentious
(d) spurious

Q18. Select the option that will improve the underlined segment in the given sentence. In case no improvement is needed, select 'No improvement'

According to J Krishnamurti, education is not about having a career but about being able to look, observation and listen.

(a) observer
(b) observant
(c) No improvement
(d) observe

Q19. The following sentence has been divided into parts. One of them may contain an 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.

She managed the company / so well that it is made / a huge profit that year.

(a) so well that it is made
(b) No error
(c) She managed the company
(d) a huge profit that year

Q20. Select the most appropriate meaning of the given idiom.

Poke one's nose

(a) Not be careful about one's health
(b) Interfere or meddle

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(c) Tease or irritate
(d) Do unhygienic things

Directions

In the following passage, some words have been deleted. Fill in the blanks with the help of the alternatives given. Select the most appropriate option for each blank.

According to Harari, a leading thinker, we are all busy (1) ____ a fantasy self online. It is the age of Facebook and Instagram, wherein (2) __ are busy creating perfect stories about ourselves. For example, pictures (3) __ perfect holidays never show the stress of traffic snarls and a host of (4) __ problems faced. We soon begin to believe in this perfect online self to be (5) ____ real one.

Q21. Select the most appropriate option for blank No. 1.

(a) creation
(b) creating
(c) creative
(d) creates

Q22. Select the most appropriate option for blank No. 2.

(a) we
(b) us
(c) each
(d) ours

Q23. Select the most appropriate option for blank No. 3.

(a) from
(b) In
(c) on
(d) of

Q24. Select the most appropriate option for blank No. 4.

(a) another
(b) other
(c) same
(d) few

Q25. Select the most appropriate option for blank No. 5.

(a) an
(b) one
(c) a
(d) the

GENERAL INTELLIGENCE

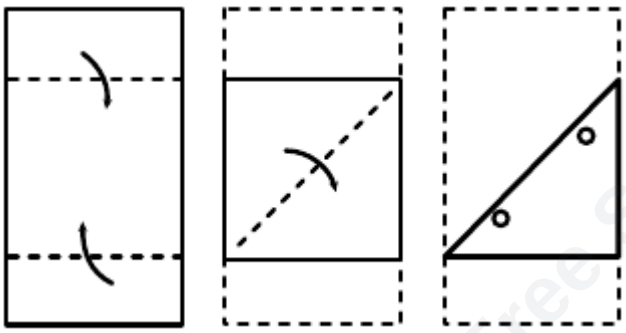
Q26. Select the number from among the given options that can replace the question mark (?) in the following series.

7, 9, 14, 24, ?, 67

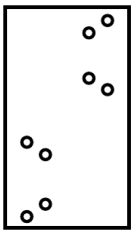
(a) 41
(b) 37
(c) 43
(d) 45

Q27. The sequence of folding a piece of paper and the manner in which the folded paper has been cut is shown in the following figures. How would this paper look when unfolded?

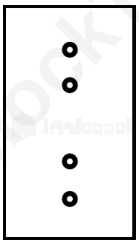
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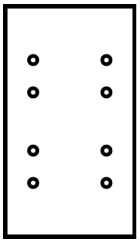
(a)



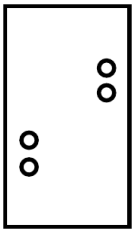
(b)



(c)



(d)



Q28. Select the correct image of the given figure when the mirror is placed at the right side of the figure.

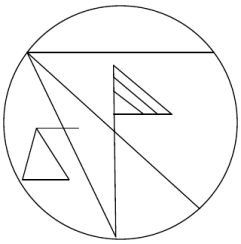
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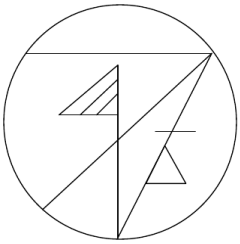
(a)



(b)



(c)



(d)



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Q29. 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.

DGKP : BJGU :: HKOT : ?

(a) FNKY
(b) GJNS
(c) FMKW
(d) JIRP

Q30. If 31 August 2008 was Sunday, then what was the day of the week on 30 August 2012?

(a) Wednesday
(b) Monday
(c) Tuesday
(d) Thursday

Q31. M is the only son of R. P is the sister of Q. X is the father of C, who is the wife of R. Q is the daughter of X's only daughter. How is M related to X?

(a) Grandson
(b) Nephew
(c) Brother
(d) Son

Q32. Select the option in which the numbers are related in the same way as are the numbers of the following set.

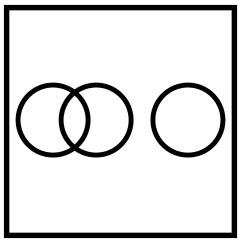
(11, 5, 246)

(a) (10, 7, 355)
(b) (16, 9, 331)
(c) (14, 6, 412)
(d) (12, 9, 224)

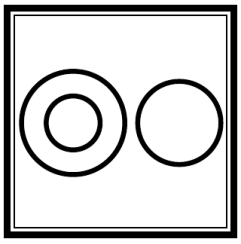
Q33. Select the Venn diagram that best represents the relationship between the following classes.

Kings, Queens, Mothers

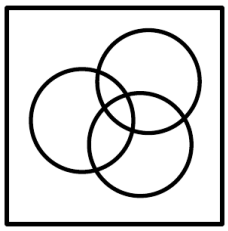
(a)



(b)

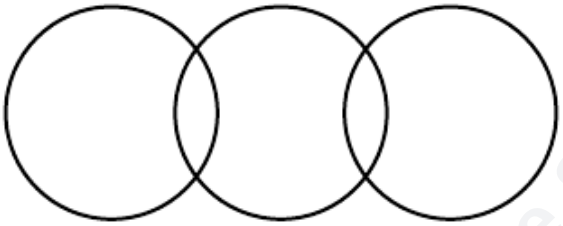


(c)



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(d)



Q34. Select the option that is related to the fourth number in the same way as the first number is related to the second number and the fifth number is related to the sixth number.

12 : 146 :: ? : 443 :: 16 : 258

(a) 23
(b) 20
(c) 19
(d) 21

Q35. Which two signs should be interchanged to make the following equation correct?

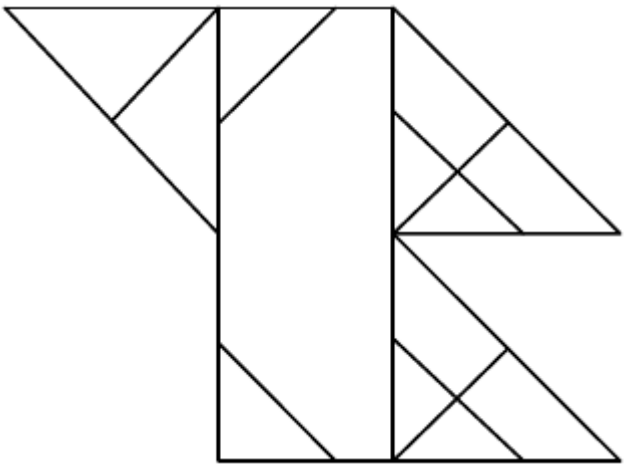
10 –15 × 9 ÷ 6 + 8 = 8

(a) – and ÷
(b) • and ÷
(c) × and −
(d) • and ×

Q36. ‘Craniology’ is related to ‘Skull’ and ‘Oology’ is related to ‘Eggs’ in the same way as ‘Pedology’ is related to _____.

(a) Artifacts
(b) Fossils
(c) Shells
(d) Soil

Q37. How many triangles are there in the given figure?



(a) 17
(b) 15
(c) 18
(d) 16

Q38. Select the correct option that indicates the arrangement of the given words in the order in which they appear in an English dictionary.

1. Pleasant
2. Placard
3. Plentiful

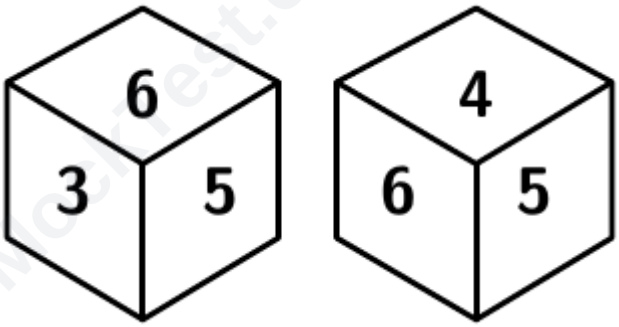
4. Pleased
5. Plight

(a) 4, 1, 2, 3, 5
(b) 1, 2, 4, 3, 5
(c) 2, 1, 4, 5, 3
(d) 2, 1, 4, 3, 5

Q39. Four number-pairs have been given, out of which three are alike in some manner and one is different. Select the one that is different.

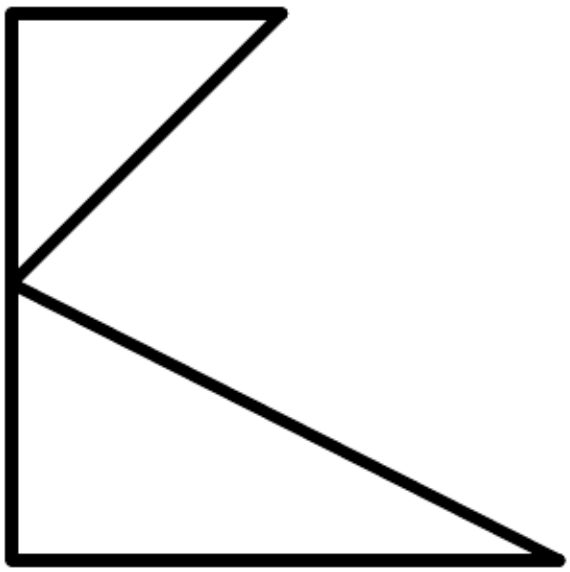
(a) 9 : 90
(b) 7 : 56
(c) 5 : 30
(d) 8 : 66

Q40. Two different position of the same dice are shown. Select the number that will be on the face opposite to the one having 4.



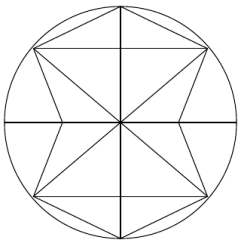
(a) 5
(b) 1
(c) 3
(d) 2

Q41. Select the option in which the given figure is embedded (rotation is NOT allowed).

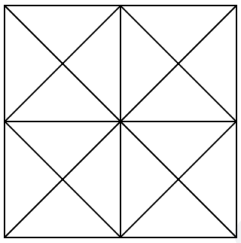


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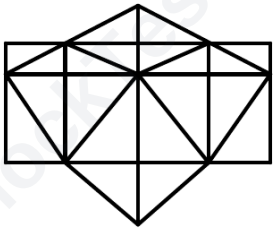
(a)



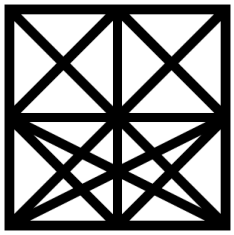
(b)



(c)



(d)



Q42. Four words have been given, out of which three are alike in some manner and one is different. Select the word that is different.

(a) Cucumber
(b) Pumpkin
(c) Potato
(d) Bean

Q43. 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:

Some teachers are graduates.

Some graduates are females.

All females are women.

Conclusions:

I. Some females are teachers.

II. Some women are teachers.

III. All women are females.

(a) None of the conclusions follow.
(b) Only conclusion I follows.

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(c) Only conclusions II and III follow.
(d) Only conclusion II follows.

Q44. In a certain code language, CHECK is written as 6165622 and SURGE is written as 382136145. How will PRIEST be written as in that language?
(a) 1618953840
(b) 3236953840
(c) 3436953640
(d) 3236185384

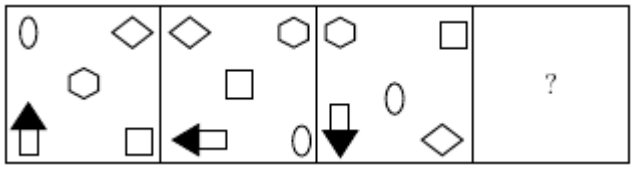
Q45. Select the combination of letters that when sequentially placed in the blanks of the given letter series will complete the series.
a c _ d a _ d d a _ _ d a c _ d
(a) d a c c d
(b) a c d c a
(c) c c d a d
(d) d c c d d

Q46. Select the option in which the words share the same relationship as that shared by the given pair of words.
Rooster : Hen
(a) Stallion : Mare
(b) Cat : Kitten
(c) Owner : Landlord
(d) Frog : Tadpole

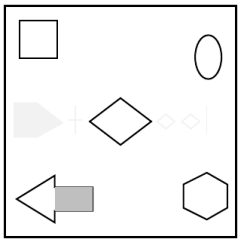
Q47. In a certain code language, HIGHER is written as JIIHSF. How will CODING be written in that language?
(a) PDJEHO
(b) OHJEPD
(c) FOHEND
(d) PDEJOK

Q48. Select the option in which the numbers are related in the same way as are the numbers of the following set.
{6, 15, 27}
(a) {14, 38, 57}
(b) {4, 10, 18}
(c) {12, 32, 54}
(d) {8, 24, 34}

Q49. Select the figure from among the given options that can replace the question mark (?) in the following series.

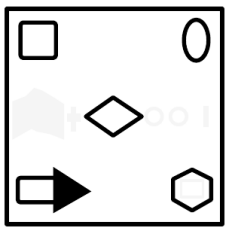


(a)

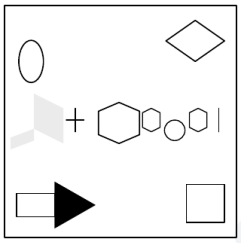


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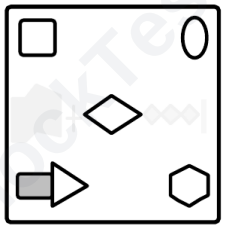
(b)



(c)



(d)



Q50. Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) QUZF
(b) NRWC
(c) LPTA
(d) CGLR

QUANTITATIVE APTITUDE

Q51. A square park has been divided into two rectangles of equal area. If the perimeter of each of these rectangles is 39 m, then what will be the perimeter of the square park?

(a) 78 m
(b) 52 m
(c) 39 m
(d) 104 m

Q52. If $(40\sqrt{5}x^3 - 2\sqrt{2}y^3) \div (2\sqrt{5}x - \sqrt{2}y) = Ax^2 + By^2 - Cxy$, then find the value of $A + 3B - \sqrt{10}C$.

(a) 28
(b) 6
(c) 46
(d) 34

Q53. A can complete a task in 6 days, while B can complete the same task in 12 days. How many days will they take to complete the same task if they work together?

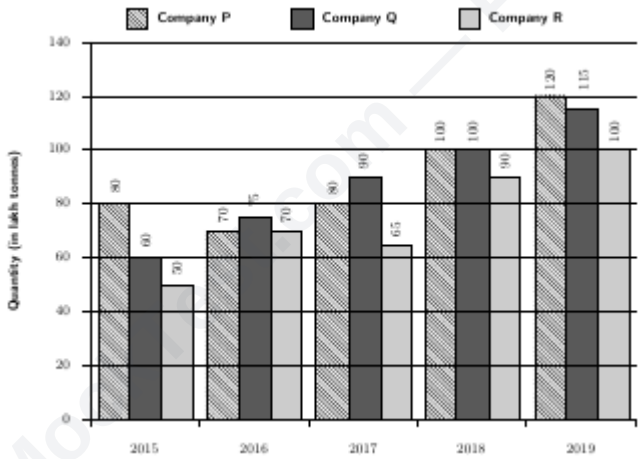
(a) 3
(b) 5
(c) 41/2
(d) 4

Q54. Suresh purchased a computer table for Rs. 9,000 and a centre table for Rs. 4,000. He sold the computer table with 8% profit. With what profit percentage should he sell the centre table so as to gain 10% on the whole transaction?

(a) 12
(b) 15
(c) 14
(d) 14.5

Q55. Study the given bar graph and answer the question that follows.

The bar graph indicates the production of sugar (in lakh tonnes) by three different sugar companies P, Q and R over the years 2015 to 2019.



The percentage rise in the production of sugar by company Q as compares to the previous year is maximum in the year:

(a) 2016
(b) 2017
(c) 2019
(d) 2018

Q56. The average pass percentage of girls in class X examination in a school is 85% and that of boys is 83%. The average pass percentage of all boys and girls in class X of that school is 83.7%. Find the percentage of the number of girls in class X of that school.

(a) 35%
(b) 40%
(c) 30%
(d) 45%

Q57. If $5 \cos \theta = 4 \sin \theta$, $0° \leq \theta \leq 90°$, then what will be the value of $\sec \theta$?

(a) $\sqrt{41}/16$
(b) $\sqrt{41}/4$
(c) 3/5
(d) $\sqrt{41}/5$

Q58. AB is 12 cm long chord of a circle with centre O and radius 10 cm. The tangents at A and B intersect at P. What is the length of OP?

(a) 12 cm
(b) 10 cm
(c) 12.5 cm
(d) $2\sqrt{61}$ cm

Q59. Ramesh saves 262/3% of his monthly salary. When his expenses are increased by 20%, he is able to save Rs. 4,080 per month. His monthly salary is:

(a) Rs. 30,000
(b) Rs. 35,000
(c) Rs. 34,000

(d) Rs. 38,000

Q60. A shopkeeper offers successive discounts of 35%, 10% and 6% on every item. At what price (nearest to a rupee) customers can get an item marked for Rs. 1,000?

(a) Rs. 645
(b) Rs. 450
(c) Rs. 550
(d) Rs. 562

Q61. Simplify the following expression.

(52+1170 ÷ 26 + 13 × 2)/(2+11/8 of 2-11/4)

(a) 611/2
(b) 371/3
(c) 41
(d) 245/6

Q62. If x^4+1/(x^4)=1154,x>0,, then what will be the value of x+1/x?

(a) √34
(b) √32
(c) 18
(d) 6

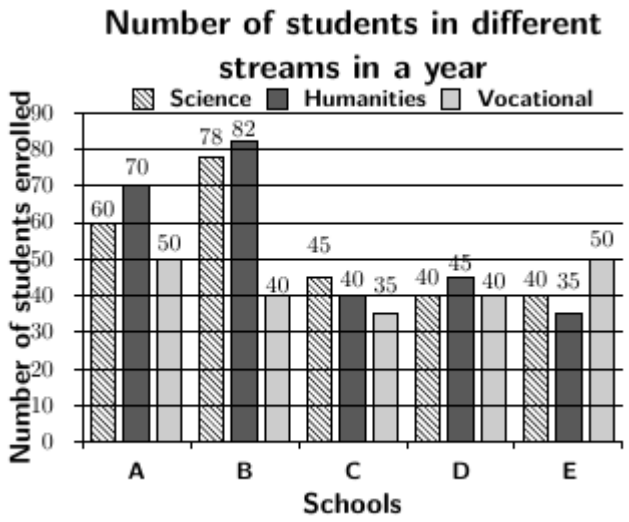
Q63. If $x + y = 27$ and $x^2 + y^2 = 425$, then the value of $(x - y)^2$will be:

(a) 225
(b) 144
(c) 121
(d) 169

Q64. A circle is inscribed in a right-angled triangle. The lengths of the two sides containing the right angle are 15 cm and 8 cm. What is the radius of the in-circle?

(a) 4 cm
(b) 3 cm
(c) 4.5 cm
(d) 3.75 cm

Q65. The number of students enrolled in different streams at Senior Secondary level in five schools is shown in the bar graph.



In which school is the number of students the least?

(a) C
(b) E

(c) A
(d) D

Q66. If two numbers are in the ratio 4 : 7 and the sum of their cubes is 407,000, then the greater number will be:

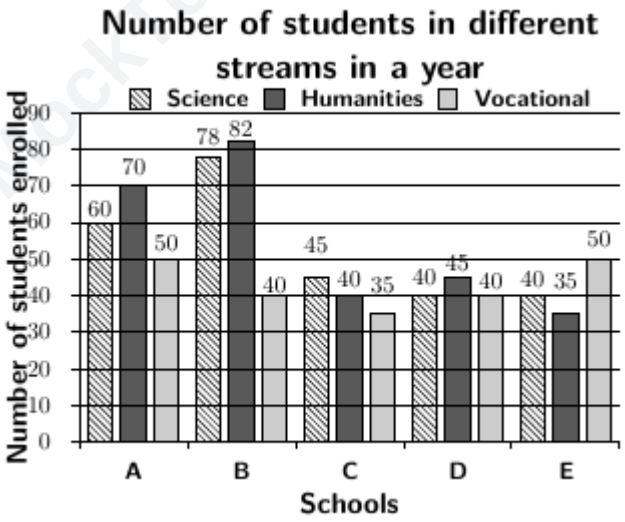
(a) 63
(b) 70
(c) 84
(d) 77

Q67. If $(\text{cosec}^2\theta)/(\text{cosec}^2\theta - \cot^2\theta)=13/4, 0°<\theta<90°$, then the value of $(52\cos^2\theta-9\tan^2\theta)/(18\sec^2\theta + 8\cot^2\theta)$ will be:

(a) 5/11
(b) 4/11
(c) 8/13
(d) 8/11

Q68. The number of students enrolled in different streams at Senior Secondary level in five schools has been shown in the bar graph.

What percentage of the total number of students in all the streams taken together in all the five schools to the number of students enrolled in the science stream in school A?



(a) 6
(b) 7.5
(c) 8.57
(d) 8

Q69. If the number 645A2879B8 is divisible by both 8 and 9, then the smallest possible values of A and B will be:

(a) A = 4, B = 3
(b) A = 3, B = 4
(c) A = 3, B = 2
(d) A = 2, B = 3

Q70. The speed of a car is 40% more than that of a bus. A train covers 1020 km in 81/2 hours. How much distance will the car cover in 13/4 hours if the speed of the bus is half the speed of the train?

(a) 164 km
(b) 145 km
(c) 147 km
(d) 174 km

Q71. The simple interest on a certain sum of money for 5 years at the rate of 10% per annum is half the compound interest on Rs. 5,000 for 2 years at the rate of 10% per annum, interest compounded yearly. The sum placed on simple interest is:

(a) Rs. 1,050
(b) Rs. 1,540
(c) Rs. 1,500
(d) Rs. 1,450

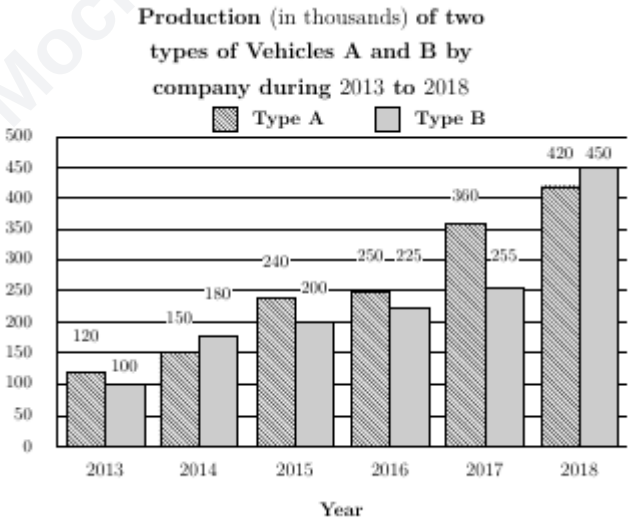
Q72. If the perimeter of an isosceles right triangle is 15(√2 + 1) cm, then the area of the triangle will be:

(a) 55 cm²
(b) 45 cm²
(c) 46.5 cm²
(d) 56.25 cm²

Q73. In a right-angled triangle ABC right angled at C, sin A = sin B. What is the value of cos A?

(a) 1/√2
(b) 1/2
(c) 1
(d) √3/2

Q74. Study the given graph and answer the question that follows.



By what percentage (approximately) is the average number of vehicles of type B produced in 2014, 2016 and 2018 less than the number of vehicles of type A produced in 2017?

(a) 20.8
(b) 18.6
(c) 21.4
(d) 23.6

Q75. AB is the diameter of a circle of radius 9 cm. PQ is a chord (not a diameter) that intersects AB at M perpendicularly. If AM : BM = 5 : 4, then the length of chord PQ will be:

(a) 6√3 cm
(b) 5√5 cm
(c) 8√5 cm
(d) 6√5 cm

GENERAL AWARENESS

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Q76. With which bank did Indian Army sign an MoU for serving retired personnel in December 2020?

(a) HDFC Bank
(b) Union Bank
(c) Bank of Baroda
(d) State Bank of India

Q77. According to ‘Population estimation of tigers in reserves for 2018-19’ which of the following is India's largest tiger reserve?

(a) Bandipore
(b) Corbett
(c) Nagarhole
(d) Dudhwa

Q78. Which everyday morning ritual is part of quantum mechanics?

(a) Brushing teeth
(b) Ringing of an alarm clock
(c) Making tea
(d) Reading newspaper

Q79. When an economy is facing inflation, what will the central bank of the country do?

(a) Print more notes
(b) Set up more ATMs to help the public
(c) Reduce the cost of money by reducing rates
(d) Raise the cost of money by raising rates

Q80. Which Indian film was the first film to win the ‘Palme d'Or’ at Cannes Film Festival?

(a) Mughal-e-Azam
(b) Ram Aur Shyam
(c) Neecha Nagar
(d) Mother India

Q81. Purna, Manjira and Pranhita are tributaries of:

(a) Indus
(b) Yamuna
(c) Chambal
(d) Godavari

Q82. Which of the following is a capacity-building scheme that was launched in 2020 for civil servants aimed at upgrading the post-recruitment training mechanism of the officers and employees at all levels?

(a) Mission Rakshak
(b) Mission Sahayog
(c) Mission Karmayogi
(d) Mission Swabhiman

Q83. Which of the following Articles of the Constitution of India details 'Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth'?

(a) Article 10
(b) Article 15
(c) Article 27
(d) Article 22

Q84. How many bits does an IP address consist of?

(a) 32
(b) 24
(c) 16

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(d) 12

Q85. In which of the following options is the substance INCORRECTLY paired with the acid present in that substance?

(a) Tomato - Oxalic Acid
(b) Orange - Citric Acid
(c) Vinegar - Acetic Acid
(d) Lemon - Lactic Acid

Q86. Where were the terracotta models of the plough excavated in Harappan civilization?

(a) Kashmir
(b) Banawali
(c) Amrinal
(d) Lothal

Q87. Who was awarded the Nobel Prize in Literature 2020?

(a) Andrea M Ghez
(b) Roger Penrose
(c) Reinhard Genzel
(d) Louise Glück

Q88. Who among the following is the first table tennis player to win the Rajiv Gandhi Khel Ratna Award?

(a) Manika Batra
(b) Poulomi Ghatak
(c) Soumyajit Ghosh
(d) Sharath Kamal

Q89. Onions produce the chemical irritant known as syn-propanethial-S-oxide; this stimulates the eyes' _____ glands which release tears.

(a) parotid
(b) lachrymal
(c) submandibular
(d) sublingual

Q90. In which year did Akbar analyse the state revenue statistics for the last 10 years, which contained information on price fluctuations and land productivity?

(a) 1548
(b) 1569
(c) 1580
(d) 1536

Q91. Who among the following is the head coach of India’s men’s (Senior) football team as of December 2020?

(a) Robert Jarni
(b) Igor Stimac
(c) Dražen Ladić
(d) Stephen Constantine

Q92. Which of the following teams has won the Indian Premier League (IPL) trophy five times as of November 2020?

(a) Sunrisers Hyderabad
(b) Chennai Super Kings
(c) Mumbai Indians
(d) Rajasthan Royals

Q93. Who among the following started the construction of the Qutub Minar?

(a) Akbar
(b) Jahangir
(c) Qutb al-Din Aibak

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(d) Iltutmish

Q94. Which of the following institutions conducts the survey on employment and unemployment?

(a) National Institution of Economic and Social Research
(b) National Sample Survey Organisation
(c) National Council of Applied Economic Research
(d) NITI Aayog

Q95. Which of the following provisions and the constitutions of different countries from which they have been adopted in the Constitution of India has been INCORRECTLY paired?

(a) The idea of the rule of law - British Constitution
(b) Charter of Fundamental rights - United States Constitution
(c) Principals of Liberty, Equality and Fraternity - Canadian Constitution
(d) Directive Principles of State Policy - Irish Constitution

Q96. Which of the following ships was launched on 14 December 2020 in Kolkata?

(a) INS Kolkata
(b) INS Himgiri
(c) INS Jalashwa
(d) INS Shardul

Q97. Which of the following is a dance form of West Bengal where there is a confluence of dancing, singing, drama and recital?

(a) Hudo
(b) Tippani
(c) Bhavai
(d) Alkap

Q98. Which of the following valleys is NOT located in Himachal Pradesh?

(a) Silent Valley
(b) Malana Valley
(c) Markha Valley
(d) Chumbi Valley

Q99. India's longest LPG pipeline is from Jamnagar to _____.

(a) Hazira
(b) Namrup
(c) Vijaynagar
(d) Loni

Q100. Second generation computers (1955-1964) were made of:

(a) small scale integrated circuit chips
(b) transistors
(c) large scale integrated circuit chips
(d) vacuum tubes

ANSWER KEY

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

51	b	52	c	53	d	54	d	55	a	56	a	57	b	58	c	59	c	60	c
61	c	62	d	63	c	64	b	65	a	66	b	67	d	68	d	69	c	70	c
71	a	72	d	73	a	74	a	75	c	76	c	77	b	78	b	79	d	80	c
81	d	82	c	83	b	84	a	85	d	86	b	87	d	88	a	89	b	90	c
91	b	92	c	93	c	94	b	95	c	96	b	97	d	98	a	99	d	100	b

SOLUTIONS

Q1. Answer: (c) The plumber said to Ranjit, “I have fixed the leaking tap.”

The correct answer is 'The plumber said to Ranjit, “I have fixed the leaking tap.”'

Key Points

• The given sentence in Indirect speech.

• As the reported verb is 'told' then we need to change it into 'said to' also the tense of the sentence is in the past perfect tense hence, we need to use a present perfect tense.

• Also, the pronoun will be according to the 'Subject' i.e. 'The plumber' the receiver is 'Ranjit'

• Hence, the correct direct speech is Option 3.

Additional Information

• Some of the important rules-

• In complex sentences, the past simple and past continuous may remain unchanged if the temporal relationship between the events in the clauses is clear from the context

• Example- John said to me, "When I got home, I went to bed straight away." (Direct speech)

John told me that when he got home he went to bed straight away. (Indirect speech)

• When the reported is in the present tense then the tense of the sentence will not be changed.

Q2. Answer: (d) Conglomarate

The solution is in Hindi. Read it online.

Q3. Answer: (a) Drey

The correct answer is 'Drey'

Key Points

• Let's see the meanings of the given words-

• Drey- the nest of a squirrel, typically in the form of a mass of twigs in a tree.

• Hole- a hollow place in a solid body or surface.

• Lair- a place where a wild animal, especially a fierce or dangerous one, lives

• Burrow- a hole or tunnel dug by a small animal, especially a rabbit, as a dwelling.

• Hence, according to the meaning of the given words, the correct answer is Option 1.

Q4. Answer: (d) one who is energetic and enthusiastic about something

The solution is in Hindi. Read it online.

Q5. Answer: (d) Charge

The solution is in Hindi. Read it online.

Q6. Answer: (c) CADB

The correct answer is 'CADB'

Key Points

• On reading the sentences, we can easily comprehend that the passage is talking about government guidelines for air travel.

• The introductory sentence will be C as it tells us about the government guidelines and when they are initiated.

• The second sentence will be A as it tells us that how can one travel to airport.

• The third sentence will be D as it tells us that what we have to do after reaching the airport.

• The fourth sentence will B as it is only sentence which is remaining.

Hence, the correct passage is- According to the government guidelines, air travel is declared open from May 2020 for passengers. They can travel to the airport by personal vehicle or registered cabs only. Once there, they can walk in through the Entry Gates,

which shall be kept open. Finally, all passengers are advised to strictly follow social distancing markers.

Q7. Answer: (b) beyond

The solution is in Hindi. Read it online.

Q8. Answer: (b) connected

The solution is in Hindi. Read it online.

Q9. Answer: (a) How much will you be paid by them?

The correct answer is How much will you be paid by them?

Key Points

• The given sentence is an interrogative sentence active voice.

• While changing it into the passive voice we need to use the following structure-

• How + adverb + helping verb + be + V3 + by + Object?

• Hence, the correct passive voice of the sentence is given in Option 1.

Q10. Answer: (a) to beating

The erroneous part is 'to beating'

Key Points

• Instead of using 'to beating' we need to use 'to beat'

• In the given sentence, we need to use an infinitive phrase instead of prepositional phrase.

• We use the infinitive phrase when the action of the sentence has yet not happened or it is going to be happened soon. In the given sentence, it is clearly given that he will be leaving office as it is future prospect of the sentence. Hence, we need to use an infinitive phrase.

So the correct sentence is- He will be leaving home at 8 a.m. to beat the office rush hour.

Q11. Answer: (a) straightforward

The solution is in Hindi. Read it online.

Q12. Answer: (c) Bright

The solution is in Hindi. Read it online.

Q13. Answer: (a) nostalgia

The solution is in Hindi. Read it online.

Q14. Answer: (a) CDBA

The correct answer is CDBA

Key Points

• On reading the sentences carefully we can comprehend that the passage is all about Bonsai an art of cultivating small trees.

• The first sentence will be C as it tells us about Bonsai and its origin.

• The second sentence will be D as it gives the proper definition of Bonsai.

• The third sentence will be B as it tells about the indoor bonsai a part of Bonsai cultivation.

• The fourth sentence will be A as it is the only remaining sentence in the whole passage.

So the correct passage is- Bonsai is an important part of Japanese culture dating back to the 14th century. It is the art of cultivating small trees within a container that take the shape and scale of full-size trees. The indoor bonsai plants enhance the aesthetic appeal of the space and offer multiple health and psychological benefits. That is why they are considered the best indoor plants to keep at homes and offices.

Q15. Answer: (d) will be inflicted on them

The solution is in Hindi. Read it online.

Q16. Answer: (d) honest

The solution is in Hindi. Read it online.

Q17. Answer: (c) conscentious

The solution is in Hindi. Read it online.

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Q18. Answer: (d) observe

The correct answer is Observe.

Key Points

• In the given sentence, the usage of 'observation' is incorrect instead of this we need to use Observe.

• In the given sentence, an infinitive phrase is used hence, we need to use a verb forms as there is a complete parallelism in the verb forms so we need to follow this completely.

• The verbs 'look, observe and listen' should be in the parallel forms i.e. why observation is incorrect.

So the correct sentence is- According to J Krishnamurti, education is not about having a career but about being able to look, observe and listen.

Q19. Answer: (a) so well that it is made

The incorrect part is 'So well that it is made'

Key Points

• The usage of 'is made' is incorrect instead of this we need to use 'made'

• The given sentence is in the past tense as we can comprehend this from the very first verb of the sentence i.e. 'managed' so we need to use a past form of the verb in the other clause as well. So the correct verb form is 'made'

• The usage of 'so well that' is absolutely correct as so that is a correlative pair of conjunction that means 'with the purpose that; in order that'

Hence, the correct sentence is- She managed the company so well that it made a huge profit that year.

Q20. Answer: (b) Interfere or meddle

The correct answer is Interfere or meddle

Key Points

• The meaning of the given idiom 'Poke one's nose' is To involve or insert oneself in an intrusive or nosy manner into something that is not one's business or responsibility.

• Let's see an example-

• He is always poking his nose into my affairs.

• Hence, the correct answer is Option 2.

Q21. Answer: (b) creating

The correct answer is Creating.

Key Points

• According to Harari, a leading thinker, we are all busy (1) _____ a fantasy self online.

• On reading the passage, we can comprehend that the passage is all about online fantasy and creating perfect stories.

• In the first blank, we need a noun as the sentence says that we are all busy in what? i.e. creating a fantasy 'a fantasy' is an object complement.

Hence, the correct sentence is- According to Harari, a leading thinker, we are all busy creating a fantasy self online.

Q22. Answer: (a) we

The correct answer is We.

Key Points

• It is the age of Facebook and Instagram, wherein (2) _____ are busy creating perfect stories about ourselves.

• In the given blank, we need a subject of the sentence because a verb is mentioned which 'are' the subject should be in the plural form.

• Hence, the correct option is 1 i.e. We.

So the correct sentence is- It is the age of Facebook and Instagram, wherein we are busy creating perfect stories about ourselves.

Q23. Answer: (d) of

The solution is in Hindi. Read it online.

Q24. Answer: (b) other

The correct answer is 'other'

Key Points

• never show the stress of traffic snarls and a host of (4) _____ problems faced.

• In the given blank, we need a determiner. 'Other' means 'in addition to or different from the one or ones that have already been mentioned'

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• Let's see the usages of the other determiners-

• Another- We use 'another' to say one more.

• Same- two or more things are exactly like one another.

• Few- when we want to talk about the quantity of something.

• In the given sentence, the speaker is talking about the problems faced which are in addition to the problems of stress of traffic snarls, etc. Hence, the correct determiner should be 'Other'

So the correct sentence is- never show the stress of traffic snarls and a host of other problems faced.

Q25. Answer: (d) the

The correct answer is 'the'

Key Points

• We soon begin to believe in this perfect online self to be (5) _____ real one.

• In the given blank, we need a definite article because the problem is known to everyone hence, we need to use a definite article in the given blank. So the correct answer is Option 4.

So the correct sentence is- We soon begin to believe in this perfect online self to be the real one.

Q26. Answer: (a) 41

The pattern followed here is:

Hence, '41' is the correct answer.

Q27. Answer: (a) [figure]

• The image obtained when the paper is unfolded is as shown below:

Hence, "option 1" is the correct answer.

Q28. Answer: (b) [figure]

The correct mirror image of the given figure when the mirror is held at the right side is:

Hence, "option (2)" is the correct answer.

Additional Information

In Mirror image left side and right side changed vice-versa where top and bottom remain same.

Reflection of an object into the water is its water image. It appears by inverting an object vertically i.e. upside down.

The water image of the figure looks like the mirror image of the figure in case the mirror is horizontally at the bottom of the figure.

Water image is just a reflection where top and bottom part of the images changed where left and right side of the image remain same.

Q29. Answer: (a) FNKY

The logic here is,

DGKP : BJGU

Similarly,

HKOT : ?

Hence, "FNKY" is correct answer.

Q30. Answer: (d) Thursday

Odd days:

A non-leap year has 365 days and a leap year has 366 days.

Non-leap year = 365 days or 52 weeks and 1 day. So, here the number of odd days is 1.

Leap year = 366 days or 52 weeks and 2 days So, here the number of odd days are 2.

Leap year between 2008 to 2012 = 2012

And,

Non leap year between 2008 and 2012 = 2009, 2010 and 2011.

So, total number of odd day between 2000 and 2012 = 3 (Total Non- leap year) + 2 (One leap year) = 5 days = 5 odd day

Code of the day	Day
0	Sunday
1	Monday

2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday

If 31 August 2008 was Sunday, then what was the day of the week on 30 August 2012?
31 August 2008 was Sunday
=> Day on 31 August 2012 = Sunday + 5
= Sunday + 5 (odd day) = Friday
Therefore, 31 August 2012 = Friday
Now,
30 August 2012 = 31 August 2012 – 1 day
= Friday – 1day
= Thursday
Hence, 30 August 2012 was “Thursday”.

Q31. Answer: (a) Grandson

Preparing the family tree using the following symbols,
Given:
1) M is the only son of R.
2) X is the father of C, who is the wife of R.
3) Q is the daughter of X's only daughter.
4) P is the sister of Q.
Hence, the M is the "Grandson" of X.

Q32. Answer: (c) (14, 6, 412)

The Logic here is as follows:
(1^(st) Number)² + (2^(nd) number)³ = 3^(rd) Number
In (11, 5, 246)
(1^(st) Number)² + (2^(nd) number)³
= $11^2 + 5^3$
= 121 + 125
= 246 = 3^(rd) Number
Now check the all options,
Option (1) (10, 7, 355)
(1^(st) Number)² + (2^(nd) number)³
= $10^2 + 7^3$
= 100 + 343
= 443 ≠ 3^(rd) Number
Option (2) (16, 9, 331)
(1^(st) Number)² + (2^(nd) number)³
= $16^2 + 9^3$
= 256 + 729
= 985 ≠ 3^(rd) Number
Option (3) (14, 6, 412)
(1^(st) Number)² + (2^(nd) number)³
= $14^2 + 6^3$
= 196 + 216
= 412 = 3^(rd) Number
Option (4) (12, 9, 224)

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(1^(st) Number)² + (2^(nd) number)³
= 12² + 9³
= 144 + 729
= 873 ≠ 3^(rd) Number
Hence, the correct answer is "(14, 6, 412)".

Q33. Answer: (a) [figure]

The Venn diagrams best represent the relationship between - Kings, Queens, Mothers figures are shown below:
No king is mother or queen, but some queens are mothers.
Hence, ‘option 1’ is the correct answer.

Q34. Answer: (d) 21

The pattern followed here is:
√(2^(nd) number – 2) = 1^(st) number
Now follow the steps:
12 : 146
√(2^(nd) number – 2)
= √(146 – 2)
= √144
= 12 = 1^(st) number
And,
16 : 258
√(2^(nd) number – 2)
= √(258 – 2)
= √256
= 16 = 1^(st) number
Similarly,
? : 443
√(2^(nd) number – 2)
= √(443 – 2)
= √441
= 21 = 1^(st) number
Hence, "21" is correct answer.

Q35. Answer: (a) – and ÷

According to the BODMAS rule:
Option 1 : – and ÷
Given:
10 –15 × 9 ÷ 6 + 8 = 8
After interchange the signs;
10 ÷15 × 9 - 6 + 8 = 8
By BODMAS rule
0.67 × 9 - 6 + 8 = 8
6 - 6 + 8 = 8
14 - 6 = 8
8 = 8 (LHS = RHS)
Option 2 : + and ÷
Given: 10 –15 × 9 ÷ 6 + 8 = 8
After interchange the signs;
10 –15 × 9 + 6 ÷ 8 = 8
By BODMAS rule
10 –15 × 9 + 0.75 = 8
10 –135 + 0.75 = 8

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10.75 –135 = 8
-124.25 = 8 (LHS ≠ RHS)
Option 3: × and −
Given:10 –15 × 9 ÷ 6 + 8 = 8
After interchange the signs;
10 ×15 - 9 ÷ 6 + 8 = 8
By BODMAS rule
10 ×15 – 1.5 + 8 = 8
150 – 1.5 + 8 = 8
158 – 1.5 = 8
156.5 = 8 (LHS ≠ RHS)
Option 4: + and ×
Given: 10 –15 × 9 ÷ 6 + 8 = 8
After interchange the signs;
10 –15 + 9 ÷ 6 × 8 = 8
By BODMAS rule
10 –15 + 1.5 × 8 = 8
10 –15 + 12 = 8
22 –15 = 8
7 = 8 (LHS ≠ RHS)
Hence, the answer is "– and ÷".

Q36. Answer: (d) Soil

The logic followed here is:
Given:
'Craniology' is related to 'Skull' → Craniology is the science that study of skull.
And,
'Oology' is related to 'Eggs' → Oology is the science that study of eggs.
Similarly,
'Pedology' is related to 'Soil'.→ Pedology is the science that study of soil.
Hence, 'Soil' is the correct answer.

Q37. Answer: (a) 17

The number of triangles in the given figure is:
So, there are a total of 17 triangles in the figure.
Hence, '17' is the correct answer.

Q38. Answer: (d) 2, 1, 4, 3, 5

According to the sequence in the dictionary:
The correct order of the given words is:
2. Placard
1. Pleasant
4. Pleased
3. Plentiful
5. Plight
Hence, the correct answer is "2, 1, 4, 3, 5".

Q39. Answer: (d) 8 : 66

The logic is here is:
1^(st) number × (1^(st) number + 1) = 2^(nd) number.
Option (1): 9 : 90
Now, follow the logic:
9 × (9 + 1) = 9 × 10 = 90 = 2^(nd) number

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This option follows the pattern.
Option (2): 7 : 56
7 × (7 + 1) = 7 × 8 = 56 = 2^(nd) number
This option follows the pattern.
Option (3): 5 : 30
5 × (5 + 1) = 5 × 6 = 30 = 2^(nd) number
This option follows the pattern.
Option (4): 8 : 66
Now, follow the logic:
8 × (8 + 1) = 8 × 9 = 72 ≠ 2^(nd) number
This option do not follow the pattern.
Hence, pair “8 : 66” is an odd one.
Alternate MethodThe logic followed here is:
Square of 1st number + 1st number = second number
Option 1 → 9 : 90 → $9^2 + 9 = 90$
Option 2 → 7 : 56 → $7^2 + 7 = 56$
Option 3 → 5 : 30 → $5^2 + 5 = 30$
Option 4 → 8 : 66 → $8^2 + 8 = 72 \neq 66$
Hence, the correct answer is "Option 4".

Q40. Answer: (c) 3

For this question, the relation is given below -
Logic: If two dice have the same two face value in the given image then the third number is opposite to each other.
In first dice and second dice.
Number 6 and 5 is common.
So, number 3 is opposite to 4.
Hence, the correct answer is “3”

Q41. Answer: (d) [figure]

The embedded part of this image is:
Hence, option (4) is the correct answer.

Q42. Answer: (c) Potato

The logic followed here is:
Option 1) Cucumber → Cucumber grow above the earth surface.
Option 2) Pumpkin → Pumpkin grow above the earth surface.
Option 3) Potato → Potatoes grow underground on the earth surface.
Option 4) Bean → Beans grow above the earth surface.
All vegetables are grow above the earth surface expect potato.
Hence, “Potato” is an odd one.

Q43. Answer: (a) None of the conclusions follow.

Statements:
Some teachers are graduates.
Some graduates are females.
All females are women.
The least possible diagram for the given statements is as follows
Conclusions:
I. Some females are teachers → False (There is no direct relation given between females and teachers so it can be possible but not definite)
II. Some women are teachers → False (There is no direct relation given between women and teachers so it can be possible but not definite)
III. All women are females → False (because all females are women but all women are also females it is not definite)

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Hence, “None of the conclusions follow”.

Q44. Answer: (b) 3236953840

The table is alphabets place value:
The pattern followed here is:
Step 1: Consonants place value × 2 = number.
Step 2: Vowels place value coded as a number.
'CHECK' is written as 6165622.
And,
SURGE is written as 382136145.
Similarly,
PRIEST = ?
Hence, 'PRIEST' is coded as "3236953840".

Q45. Answer: (d) d c c d d

Given :- a c _ d a _ d d a _ _ d a c _ d
By checking options and substituting accordingly.
1) d a c c d → a c d d / a a d d / a c c d / a c d d
2) a c d c a a c a d / a c d d / a d c d / a c a d
3) c c d a d → a c c d / a c d d / a d a d / a c d d
4) d c c d d → a c d d / a c d d / a c d d / a c d d
• Option (4) gives a pattern of a c d d - a c d d - a c d d - a c d d.
Hence, ‘d c c d d’ is the correct answer.

Q46. Answer: (a) Stallion : Mare

The logic followed here is:
Rooster : Hen → A rooster is a male chicken and a hen is a female chicken.
Similarly,
Stallion : Mare → A stallion is a male horse and mare is a female horse.
Hence, ‘Stallion : Mare ’ is the correct answer.

Q47. Answer: (a) PDJEHO

The table is alphabets place value:
The pattern followed here is:
HIGHER is written as JIIHSF
Similarly,
Hence, 'CODING' is coded as "PDJEHO".

Q48. Answer: (b) {4, 10, 18}

The Logic here is as follows:
(2^(nd) number × 2) - (1^(st) Number ÷ 2) = 3^(rd) Number
In {6, 15, 27}
(2^(nd) number × 2) - (1^(st) Number ÷ 2)
= (15 × 2) - (6 ÷ 2)
= 30 - 3
= 27 = 3^(rd) Number
Now check the all options,
Option (1) {14, 38, 57}
(2^(nd) number × 2) - (1^(st) Number ÷ 2)
= (38 × 2) - (14 ÷ 2)
= 76 - 7
= 69 ≠ 3^(rd) Number
Option (2) {4, 10, 18}
(2^(nd) number × 2) - (1^(st) Number ÷ 2)

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= (10 × 2) - (4 ÷ 2)
= 20 - 2
= 18 = 3^(rd) Number
Option (3) {12, 32, 54}
(2^(nd) number × 2) - (1^(st) Number ÷ 2)
= (32 × 2) - (12 ÷ 2)
= 64 - 6
= 58 ≠ 3^(rd) Number
Option (4) {8, 24, 34}
(2^(nd) number × 2) - (1^(st) Number ÷ 2)
= (24 × 2) - (8 ÷ 2)
= 48 - 4
= 44 ≠ 3^(rd) Number
Hence, the correct answer is "{4, 10, 18}".

Q49. Answer: (d) [figure]

The figure that will replace the question mark (?) in the following figure series is shown below:
1) Upper left side small figure transfer lower right side in each next figure.
2) Upper right side small figure transfer upper left side in each next figure.
3) Middle figure transfer upper right side in each next figure.
4) Lower right side figure transfer to the middle in each next figure.
5) Lower left side figure to rotate 90° anti-clockwise at own position and alternate 'front and back' side of arrow become dark.
Hence, ‘option 4’ is the correct answer.

Q50. Answer: (c) LPTA

Table show alphabet serial number –
The pattern followed is,
All follow the same pattern, except 'LPTA’.
Hence, “LPTA” is the odd one.

Q51. Answer: (b) 52 m

Given:
A square park has been divided into two rectangles of equal area.
The perimeter of each of these rectangles = 39 m
Formula used:
Area of square = side²
Perimeter of rectangle = 2(L + B)
Perimeter of square = 4a
Area of rectangle = L × B
Calculation:
Let side of the square be 'a'
According to the given statement,
(Sum of the perimeters of both rectangles) - 2a = perimeter of the square
=> 39 + 39 - 2a = 4a
=> 78 = 6a
=> a = 13
Now, perimeter of the square = 4 × 13 = 52
Therefore The required perimeter of the square is 52 m

Q52. Answer: (c) 46

Given:
(40√5x3 – 2√2y3) ÷ (2√5x – √2y) = Ax2 + By2 – Cxy
Formula used:

$a^3 – b^3 = (a – b)(a^2 + b^2 + ab)$

Calculation:

$(40\sqrt{5}x3 – 2\sqrt{2}y3) = [(2\sqrt{5}x – \sqrt{2}y)(2\sqrt{5}x)^2 + (\sqrt{2}y)^2 + 2\sqrt{5} \times \sqrt{2}]/(2\sqrt{5}x – \sqrt{2}y)$

$=> (2\sqrt{5}x)2 + (\sqrt{2}y)2 + 2\sqrt{5} \times \sqrt{2}$

$=> 20x^2 + 2y^2 + 2\sqrt{10}xy$

Now,

Comparing the value, we get

A = 20, B = 2 and C = $-2\sqrt{10}$

Now,

The value of $A + 3B – \sqrt{10}C = (20 + 3 \times 2 + 2\sqrt{10} \times \sqrt{10})$

=> (20 + 6 + 20)

=> 46

Therefore The required value is 46

Q53. Answer: (d) 4

Given:

Time taken by A to complete the work = 6 days

Time taken by B to complete the work = 12 days

Formula used:

Work = Efficiency × Time

Calculation:

LCM of 6 and 12 is 12

Efficiency of A = (12/6) = 2 units/days

Efficiency of B = (12/12) = 1 unit/day

Time taken by A and B both to complete the same task together = [12(2 + 1)] days

=> 12/3 days

=> 4 days

Therefore The required time is 4 days

Q54. Answer: (d) 14.5

Given:

Cost price of computer table = Rs. 9,000

Cost price of centre table = Rs. 4,000

Profit% for computer table = 8%

Formula used:

Profit = SP – CP

Profit% = Profit/CP × 100

Calculation:

Selling price of Computer table = Rs. (9,000 × 108/100)

=> Rs. 9,720

Total cost price of computer table and centre table = Rs. (9,000 + 4,000) = Rs. 13,000

Selling price of a computer table and centre table = Rs. (13,000 × 110/100)

=> Rs. 14,300

Selling price of centre table = Rs. (14,300 – 9,720) = Rs. 4,580

Profit of centre table = Rs. (4,580 – 4,000) = Rs. 580

Profit% of centre table = (580/4000 × 100)

=> 14.5%

Therefore The required profit% is 14.5

Q55. Answer: (a) 2016

Calculation:

The production of sugar by company Q in 2015 = 60

The production of sugar by company Q in 2016 = 75

The percentage rise in the production of sugar in 2016 by company Q as compares to the previous year 2015 = [(75 – 60)/60 × 100]

=> (15/60 × 100) = 25%

Now,

The production of sugar by company Q in 2016 = 75

The production of sugar by company Q in 2017 = 90

The percentage rise in the production of sugar in 2017 by company Q as compares to the previous year 2016 = [(90 – 75)/75 × 100]

=> (15/75 × 100) = 20%

Now,

The production of sugar by company Q in 2017 = 90

The production of sugar by company Q in 2018 = 100

The percentage rise in the production of sugar in 2018 by company Q as compares to the previous year 2017 = [(100 – 90)/90 × 100]

=> (10/90 × 100) = 11.11%

Now,

The production of sugar by company Q in 2018 = 100

The production of sugar by company Q in 2019 = 115

The percentage rise in the production of sugar in 2019 by company Q as compares to the previous year 2018 = [(115 – 100)/100 × 100]

=> (15/100 × 100) = 15%

Therefore The percentage rise in the production of sugar by company Q as compares to the previous year is maximum in the year 2016

Q56. Answer: (a) 35%

Given:

Average pass percentage of girls in class X = 85%

Average pass percentage of boys in class X = 83%

Average pass percentage of girls and boys in class X = 83.7%

Formula used:

Average = sum of observations/Number of observations

Calculation:

Let the number of girls and boys be x and y respectively

According to the question

=> 85x + 83y = 83.7(x + y)

=> 85x + 83y = 83.7x + 83.7y

=> (85x – 83.7x) = (83.7y – 83y)

=> 1.3x = 0.7y

=> x/y = 7/13

Now,

The percentage of the number of girls in class X of that school = (7/20 × 100)%

=> 35%

Therefore The percentage of the number of girls in class X of that school is 35%

Q57. Answer: (b) √41/4

Shortcut Trick

Given: 5 cos θ = 4 sin θ => tan θ = 5/4.

For a right-angled triangle, if Perpendicular = 5 and Base = 4, then Hypotenuse = $\sqrt{(5^2 + 4^2)} = \sqrt{41}$.

Since sec θ = Hypotenuse / Base, we get sec θ = √41 / 4.

Therefore The correct answer is √41 / 4.

Alternate Method

Given: 5 cos θ = 4 sin θ and 0° ≤ θ ≤ 90°.

Formula Used: tan θ = sin θ / cos θ and $\sec^2\theta = 1 + \tan^2\theta$.

=> 5 cos θ = 4 sin θ
=> sin θ / cos θ = 5 / 4
=> tan θ = 5 / 4
=> $sec^2\theta = 1 + (5 / 4)^2$
=> $sec^2\theta = 1 + 25 / 16$
=> $sec^2\theta = (16 + 25) / 16 = 41 / 16$
=> sec θ = √(41 / 16) = √41 / 4
Therefore The correct answer is √41 / 4.
Additional Information
Trigonometric Identities
Fundamental relations: $sin^2\theta + cos^2\theta = 1$, $1 + tan^2\theta = sec^2\theta$, and $1 + cot^2\theta = cosec^2\theta$.
Right Triangle Ratios
sec θ is the reciprocal of cos θ. In a right triangle, sec θ = Hypotenuse / Base.
Pythagoras Theorem
In a right-angled triangle, $Hypotenuse^2 = Perpendicular^2 + Base^2$.

Q58. Answer: (c) 12.5 cm

Given:
AB = 12 cm
Radius = 10 cm
The tangents at A and B intersect at P.
Concept used:
AAA similarity: If all three angles in one triangle are the same as the corresponding angles in the other, then the triangles are similar.
Calculation:
AB is the chord of the circle with centre O
Now,
OP perpendicular to AB
So, OP bisects AB
AL = BL = 6 cm
Also,
$OL = \sqrt{(OA)^2 - (AL)^2}$
$=> OL = \sqrt{(10)^2 - (6)^2}$
$=> OL = \sqrt{100 - 36}$
$=> OL = \sqrt{64}$
=> OL = 8 cm
Now,
In ΔOAP and ΔOLA
angle OAP = angle OLA
OA = OB = 10 cm (Radius)
OL = OL [Common]
So, ΔOAP ~ ΔOLA
=> OP/OA = OA/OL [Corresponding sides are proportional]
=> OP/10 = 10/8
=> 8 OP = 100
=> OP = (100/8) cm
=> OP = 12.5 cm
Therefore The length of OP is 12.5 cm

Q59. Answer: (c) Rs. 34,000

Given:
Salary saves = 262/3% = 80/3

Expenses increases = 20%
Saving after increase in expenses = Rs. 4,080
Calculation:
Let the salary be Rs. 100
Saving = Rs. 80/3
Expenditure = Rs. (100 – 80/3)
=> Rs. (300 – 80)/3 = Rs. 220/3
New expenditure = Rs. (120% of 220/3)
=> Rs. (120/100 × 220/3)
=> Rs. (4 × 22)
=> Rs. 88
New saving = Rs. (100 – 88) = Rs. 12
Now,
=> 12% = 4,080
=> 12/100 = 4,080
=> (4,080 × 100)/12
=> Rs. (340 × 100)
=> Rs. 34,000
Therefore The required monthly salary is Rs. 34,000

Q60. Answer: (c) Rs. 550

Shortcut Trick
Use the Effective Multiplying Factor for successive discounts.
Final price = 1000 × 0.65 × 0.90 × 0.94
=> 650 × 0.90 × 0.94 = 585 × 0.94
=> 549.9 ≈ Rs. 550
Therefore The correct answer is Rs. 550.
Alternate Method
Given:
Marked Price (MP) = Rs. 1,000
Successive Discount Rates = 35%, 10%, and 6%
Formula Used:
Selling Price (SP) = MP × (100 − d1)/100 × (100 − d2)/100 × (100 − d3)/100
Calculations:
=> Price after 35% discount = 1000 − (35% of 1000) = 1000 − 350 = Rs. 650
=> Price after 10% discount = 650 − (10% of 650) = 650 − 65 = Rs. 585
=> Price after 6% discount = 585 − (6% of 585)
=> 6% of 585 = 5.85 × 6 = 35.10
=> Final Selling Price = 585 − 35.10 = Rs. 549.90
=> Nearest to a rupee = Rs. 550
Therefore The correct answer is Rs. 550.
Additional Information
Single Equivalent Discount
For two successive discounts x% and y%, the single equivalent discount is (x + y − xy/100)%.
Marked Price and Selling Price Relation
Selling Price = Marked Price × (100 − Discount%)/100. Always apply discounts on the Marked Price (MP).
Successive Percentage Change
Final Value = Initial Value × (1 ± r1/100) × (1 ± r2/100) × ... × (1 ± r_n/100), where r is the rate of change.

Q61. Answer: (c) 41

Concept Used:
Follow the BODMAS rule according to the table given below:

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Calculation:

(52+1170 ÷ 26 + 13 × 2)/(2+11/8 of 2-11/4)

=> (52 + 1170 ÷ 26 + 13 × 2)/(2 + 9/8 of 2 – 5/4)

=> (52 + 1170 ÷ 26 + 13 × 2)/(2 + 9/4 – 5/4)

=> (52 + 45 + 13 × 2)/(2 + 9/4 – 5/4)

=> (52 + 45 + 26)/(2 + 9/4 – 5/4)

=> 123/(2 + 9/4 – 5/4)

=> 123/(8 + 9 – 5)/4

=> 123/(12/4)

=> 123/3

=> 41

Therefore The required value is 41

Q62. Answer: (d) 6

Given:

x^4+1/(x^4)=1154,x>0,

Formula used:

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

Calculation:

x^4+1/(x^4)=1154,x>0,

Adding 2 both sides, we get

=> (x^4 + 1/x^4) + 2 = 1154 + 2

=> $(x^2 + 1/x^2)^2 = 1156$

=> $(x^2 + 1/x^2) = 34$

Now,

Again adding 2 both sides, we get

=> (x2 + 1/x2) + 2 = 34 + 2

=> $(x + 1/x)^2 = 36$

=> (x + 1/x) = 6

Therefore The required value is 6

Q63. Answer: (c) 121

Given:

x + y = 27

x2 + y2 = 425

Formula used:

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

$(x – y)^2 = x^2 + y^2 – 2xy$

Calculation:

(x + y)2 = x2 + y2 + 2xy

=> $(27)^2 = 425 + 2xy$

=> 729 = 425 + 2xy

=> 2xy = 729 – 425

=> 2xy = 304

Now,

(x – y)2 = x2 + y2 – 2xy

=> $(x – y)^2 = 425 – 304$

=> $(x – y)^2 = 121$

Therefore The required value of $(x – y)^2$ is 121

Q64. Answer: (b) 3 cm

Given:

The lengths of the two sides containing the right angle are 15 cm and 8 cm

Formula used:

$H^2 = P^2 + B^2$

The radius of in-circle = (P + B – H)/2

Calculation:

Let the length of the two sides AB and BC be 15 cm and 8 cm respectively

H2 = P2 + B2

=> $H^2 = (15)^2 + (8)^2$

=> $H^2 = 225 + 64 = 289$

=> H = 17 cm

Now,

The radius of in-circle = (P + B – H)/2

=> (15 + 8 – 17)/2

=> (23 – 17)/2

=> 6/2

=> 3 cm

Therefore The required value is 3 cm

Q65. Answer: (a) C

Calculation:

The total number of students in school A = (60 + 70 + 50) = 180

The total number of students in school B = (78 + 82 + 40) = 200

The total number of students in school C = (45 + 40 + 35) = 120

The total number of students in school D = (40 + 45 + 40) = 125

The total number of students in school E = (40 + 35 + 50) = 125

Therefore The number of least students in the school C

Q66. Answer: (b) 70

Given:

The ratio of two numbers = 4 : 7

The sum of their cubes = 407,000

Calculation:

Let the cube of the numbers be 4x and 7x respectively

According to the question

=> $(4x)^3 + (7x)^3 = 407,000$

=> $64x^3 + 343x^3 = 407,000$

=> $407x^3 = 407,000$

=> $x^3 = 407,000/407$

=> $x^3 = 1000$

=> x = 10

Now,

The greater number is 7x = (7 × 10) = 70

Therefore The required greater number is 70

Q67. Answer: (d) 8/11

Given:

$(\text{cosec}^2\theta)/(\text{cosec}^2\theta - \cot^2\theta)=13/4, 0°<\theta<90°$

Formula used:

$\text{cosec}^2\theta = 1/\sin^2\theta$

$\cot^2\theta = \cos^2\theta/\sin^2\theta$

$1 – \cos^2\theta = \sin^2\theta$

$B^2= H^2 – P^2$

Calculation:

$(\text{cosec}^2\theta)/(\text{cosec}^2\theta - \cot^2\theta)=13/4, 0°<\theta<90°$

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=> 1/sin2θ/1/sin2θ – cos2θ/sin2θ = 13/4

=> 1/sin²θ/(1 – cos²θ)/sin²θ = 13/4

=> 1/sin²θ/sin²θ/sin²θ = 13/4

=> 1/sin²θ = 13/4

=> sinθ = 2/√13 = P/H

Now,

B2 = H2 – P2

=> B² = (√13)² – (2)²

=> B² = (13 – 4) = 9

=> B = 3

Now,

cosθ = B/H = 3/√13

tanθ = P/B = 2/3

secθ = H/B = √13/3

cotθ = B/P = 3/2

Now,

The value of (52 cos² θ-9 tan² θ)/(18 sec² θ + 8 cot² θ)

=> 52 × (3/√13)² – 9 × (2/3)²/18 × (√13/3)² + 8 × (3/2)²

=> (52 × 9/13 – 9 × 4/9)/(18 × 13/9 + 8 × 9/4)

=> (36 – 4)/(26 + 18)

=> 32/44

=> 8/11

Therefore The required value is 8/11

Q68. Answer: (d) 8

Calculation:

The number of students enrolled in the science stream in school A = 60

Total number of students in school A = (60 + 70 + 50) = 180

Total number of students in school B = (78 + 82 + 40) = 200

Total number of students in school C = (45 + 40 + 35) = 120

Total number of students in school D = (40 + 45 + 40) = 125

Total number of students in school E = (40 + 35 + 50) = 125

Now,

The total number of students in all the streams taken together in all the five schools = (180 + 200 + 120 + 125 + 125) = 750

The percentage of the total number of students in all the streams taken together in all the five schools is the number of students enrolled in the science stream in school A = (60/750 × 100)

=> 8%

Therefore The required percentage is 8%

Q69. Answer: (c) A = 3, B = 2

Shortcut Trick

For divisibility by 8, the last three digits 9B8 must be divisible by 8.

Smallest B: 908 (No), 918 (No), 928 (Yes, 928 ÷ 8 = 116) => B = 2.

For divisibility by 9, sum of digits (6+4+5+A+2+8+7+9+B+8) = 49 + A + B must be divisible by 9.

Substitute B = 2: 49 + A + 2 = 51 + A. Next multiple of 9 is 54 => 51 + A = 54 => A = 3.

Therefore The correct answer is A = 3, B = 2.

Alternate Method

Given: Number 645A2879B8 is divisible by 8 and 9.

Divisibility Rules:

1. Divisibility by 8: Last three digits 9B8 must be divisible by 8.

=> 900 + 10B + 8 = 908 + 10B

=> 908 ÷ 8 leaves remainder 4. So, (4 + 10B) must be divisible by 8.

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=> If B = 0, 4 (No); If B = 1, 14 (No); If B = 2, 24 (Yes).
=> Smallest value of B = 2.
2. Divisibility by 9: Sum of digits must be divisible by 9.
=> Sum = 6 + 4 + 5 + A + 2 + 8 + 7 + 9 + B + 8
=> Sum = 49 + A + B
=> Substitute B = 2: Sum = 49 + A + 2 = 51 + A
=> For 51 + A to be divisible by 9, the nearest multiple is 54.
=> 51 + A = 54 => A = 3.
Therefore The correct answer is A = 3, B = 2.
Additional Information
Divisibility by 8
A number is divisible by 8 if its last three digits are divisible by 8 or are all zeros.
Divisibility by 9
A number is divisible by 9 if the sum of its digits is a multiple of 9.
Divisibility by 72
If a number is divisible by both 8 and 9 (co-prime factors), it is also divisible by 72.

Q70. Answer: (c) 147 km

Given:
Speed of car = 40% more than that of a bus
Time taken to cover 1020 km = 81/2 hours = 17/2 hours
Formula used:
Speed = Distance/Time
Calculation:
Let the speed of bus be 100x
Then,
The speed of a car is 40% more than that of a bus = (140% of 100x)
=> (140/100 × 100x) = 140x
Speed of car = 140x
Now,
According to the question
The speed of the bus is half the speed of the train = (100x × 2) = 200x
The ratio of car, bus and train = (140x : 100x : 200x)
=> 7x : 5x : 10x
Now,
Speed = Distance/Time
=> (1020/17/2)
=> (1020 × 2)/17
=> 120 km/h
Speed of train = (120/10x) = 12x
Now, Speed of bus = 5x = 5 × 12 = 60 km/h
Speed of car = 7x = 7 × 12 = 84 km/h
Now,
The speed of car covers in 13/4 hours = (84 × 7/4) km
=> (21 × 7) km
=> 147 km
Therefore The required distance is 147 km
Shortcut Trick
We know 40% = 2/5 and
speed of a car is 40% more than that of a bus, so
Speed of bus is 5 unit and speed of car is 7 unit,
According to the question, speed of train is 1020/8.5 = 120 km/hr

So, speed of bus is 120/2 = 60 km/hr

So, 5 unit → 60 km/hr

Then, speed of car 7 unit → 60/5 × 7 = 84 km/hr

Now, the car covers in 13/4 hours is (84 × 7/4) = 147 km

Q71. Answer: (a) Rs. 1,050

Given:

The simple interest on a certain sum of money for 5 years at the rate of 10% per annum is half the compound interest on Rs. 5,000 for 2 years at the rate of 10% per annum, interest compounded yearly

Formula used:

SI = (P × R × T)/100

CI = P(1 + R/100)^T – P

Where, P = Principal, R = Rate, T = Time

Calculation:

CI = P(1 + R/100)T – P

=> 5000(1 + 10/100)² – 5000

=> 5000(110/100)² – 5000

=> (5000 × 11/10 × 11/10) – 5000

=> Rs. 6050 – 5000

=> Rs. 1050

Now,

SI is half the CI = Rs. (1050 × 1/2) = Rs. 525

Now,

SI = (P × R × T)/100

=> 525 = (P × 5 × 10)/100

=> 525 = 50P/100

=> P = Rs. (525 × 100)/50

=> P = Rs. 1050

Therefore The sum placed on simple interest is Rs. 1,050

Q72. Answer: (d) 56.25 cm²

Given:

The perimeter of an isosceles right triangle = 15(√2 + 1) cm

Concept used:

Perimeter of the triangle is sum of all sides

Formula used:

Area of triangle = 1/2 × base × height

Calculation:

Let equal sides of the isosceles right triangle is x cm

Then, Hypotenuse of the triangle is √2x cm

According to the question

The perimeter of the triangle is

=> x + x + √2x = 15(√2 + 1)

=> 2x + √2x = 15(√2 + 1)

=> √2x(√2 + 1) = 15(√2 + 1)

=> √2x = 15

=> x = 15/√2

Now,

Area of the triangle = (1/2 × 15/√2 × 15/√2) cm²

=> 225/4 cm²

=> 56.25 cm²

Therefore The required value is 56.25 cm²

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Q73. Answer: (a) 1/√2

Given:

In a right-angled triangle ABC right angled at C

sinA = sinB

Formula used:

cosθ = B/H

cos 45° = 1/√2

Calculation:

In a right-angled triangle ABC right angled at C

We know that, the sum of all the angle of triangle is 180°

angle C = 90° and angle A = angle B = 45°

Now,

The value of cosA = cos45°

=> 1/√2

Therefore The required value of cos A is 1/√2

Q74. Answer: (a) 20.8

Calculation:

The total number of vehicles of type B produced in 2014, 2016 and 2018 = (180 + 225 + 450) = 855

The average number of vehicles of type B produced in 2014, 2016 and 2018 = (855/3) = 285

The number of vehicles of type A produced in 2017 = 360

The percentage in the average number of vehicles of type B produced in 2014, 2016 and 2018 less than the number of vehicles of type A produced in 2017 is

=> [(360 – 285)/360 × 100]

=> (75/360 × 100)

=> 20.8%

Therefore The required percentage is 20.8

Q75. Answer: (c) 8√5 cm

Given:

AB is the diameter of a circle of radius 9 cm

PQ is a chord (not a diameter) that intersects AB at M perpendicularly

AM : BM = 5 : 4

Calculation:

Let the ratio of AM and BM be 5x and 4x respectively

Then,

AB is the diameter of a circle of radius 9 cm = (9 × 2) = 18 cm

=> (5x + 4x) = 18

=> 9x = 18

=> x = 2

Now,

AM = 5x = (5 × 2) = 10 cm

BM = 4x = (4 × 2) = 8 cm

Now,

PM = MQ (AB is the diameter of the given circle and PQ is the perpendicular on AB)

As we know,

=> PM × MQ = AM × MB

=> PM × PM = 10 × 8

=> $PM^2 = 80$

=> PM = 4√5 cm

Now,

PQ = 2PM

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=> PQ = (2 × 4√5) cm

=> PQ = 8√5 cm

Therefore The required value of PQ is 8√5 cm

Q76. Answer: (c) Bank of Baroda

The correct answer is Bank of Baroda.

• Indian Army signed an MoU with Bank of Baroda for serving retired personnel in December 2020.

Important Points

• Indian Army and Bank of Baroda have entered into a Memorandum of Understanding for 'Baroda Military Salary Package'

• Under the MOU bank would offer customized services along with facilities to the account holders.

• Benefits: Free Personal Accidental Insurance Cover, Permanent Total Disability Cover, Partial Disability Cover, Air Accident Insurance cover, Higher Education, Girl Child Marriage cover on death in case of serving personnel, Unlimited free ATM transactions at all bank ATMs.

Additional Information

Bank	Details
HDFC	• It is an Indian banking and financial service company(private sector). - Hashmukhbhai Parekh is the founder of HDFC Bank. - Its headquarters is located in Mumbai.
Union Bank	• It is a Government-owned bank. - Seth Sitaram Poddar is the founder of Union Bank. - Its headquarters is located in Mumbai.
Bank of Baroda	• It is an Indian banking and financial service company. - Sayaji Rao Gaekwad III was the founder of Bank of Baroda Bank.
State Bank of India	• It is an Indian multinational public sector bank. - Its headquarters is located in Mumbai.

Q77. Answer: (b) Corbett

The correct answer is Corbett.

• According to ‘Population estimation of tigers in reserves for 2018-19’ Corbett is India's largest tiger reserve.

Key Points

• Jim Corbett National Park is located in the Nainital district of Uttarakhand State.

• It was the first Indian National Park(Hailey National Park renamed as Corbett National park) that was established in 1936.

• The park was first to come under the Project Tiger initiative.

Additional Information

Tiger Reserve	Details
Bandipore	• It is located in Gundul pet taluk, Chamarajnagar district, Karnataka. - It is a part of the Niligiri Biosphere Reserve. - The park shares boundaries with three other national parks namely Nagarhole, Wayanad, Mudumalai. - It comes under Project Tiger.
Nagarhole	• Nagarhole national park is located in the Kodagu and Mysore districts of Karnataka. - The park derives its name from Naga meaning snake and hole meaning streams. - It is a part of the Niligiri Biosphere Reserve.
Dudhwa	• Dudhwa national park is located in the Terai belt of marshy grasslands in northern Uttar Pradesh. - The park is located on the Indo-Nepal border.

Q78. Answer: (b) Ringing of an alarm clock

The correct answer is Ringing of an alarm clock.

• The ringing of an alarm clock morning ritual is part of quantum mechanics.

Key Points

• Quantum Mechanics is a fundamental theory in physics.

• It describes the physical properties of nature at the scale of atoms and subatomic particles.

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• Examples: Toaster
• Fluorescent light
• Laser
• Global positioning
• Computer and Mobile phone.
• Biological Compass
• Microscopy.

Q79. Answer: (d) Raise the cost of money by raising rates

The correct answer is to Raise the cost of money by raising rates.

• When an economy is facing inflation, the central bank of the country will Raise the cost of money by raising rates.

Key Points

• Inflation refers to a progressive increase in the goods and services of an economy.
• An increase in the demand and Reduce in supply are two reasons that can be attributed to price rise.
• When the general price level increases each unit of currency buys fewer goods and services.
• Inflation corresponds to a reduction in the purchasing power of money.
• Note: It is not high prices but rising price levels constitute inflation.

Important Points

• Reserve Bank of India is the central bank of India.
• It was originally set up as a private entity in 1935 under RBI Act and it was nationalized in the year 1949.
• RBI conducts consolidated supervision of the financial sector of India which constitutes commercial banks, financial institutions, and nonbanking finance firms.
• Its headquarters is located in Mumbai.

Q80. Answer: (c) Neecha Nagar

The correct answer is Neecha Nagar.

• Neecha Nagar was the first Indian film to win the ‘Palme d'Or’ at Cannes Film Festival.

Key Points

• Neecha Nagar is the first film that took Indian cinema on the global stage was directed by Chetan Anand.
• ‘Palme d'Or’ is considered the highest honor for cinema.
• Neecha Nagar had a strong theme that captures India in 1946.
• The film talks about the gulf between the rich and poor in society.

Additional Information

• Cannes film festival is an annual film festival held in Cannes, France which previews new films of all genres including documentaries from all around the world.
• It was founded in 1946.

Q81. Answer: (d) Godavari

The correct answer is the Godavari.

• Purna, Manjira and Pranhita are tributaries of Godavari.

Key Points

• Godavari is India's second-longest river after Ganga and the third largest in India.
• It originates in Trimbakeshwar, Nashik, Maharashtra, and empties into the Bay of Bengal.
• Geography of the river: Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, Odisha.
• Major Right bank tributaries: Pravara, Manjira, Manair,
• Major Left bank tributaries: Purna, Pranahita, Indravati, Sabari.

Additional Information

Rivers	Details
Indus	• The trans-Himalayan river originates in western Tibet. - Important tributaries: Gilgit, Beas, Chenab, Jhelum, Ravi, Sutlej, Zaskar, Shyok.

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Chambal	• Chambal is a part of the greater Gangetic drainage system. - It originates at Janapav, South of Mhow town on the south slope of the Vindhyan range in Madhya Pradesh. - It is a tributary of the Yamuna river. - Important tributaries: Parbati, Kali, Sindh, Shipra, Banas, Mej
Yamuna	• It originates in Yamunotri Glacier, Uttarakhand. - It is a tributary of the Ganga. - Important tributaries: Hindon, ken, Chambal, Sindh, Tons, Betwa, Sasur Khadheri.

Q82. Answer: (c) Mission Karmayogi

The correct answer is Mission Karmayogi.

• Mission Karmayogi is a capacity-building scheme that was launched in 2020 for civil servants aimed at upgrading the post-recruitment training mechanism of the officers and employees at all levels.

Key Points

• The biggest bureaucratic reform initiative of 'Mission Karmayogi' a National Program for Civil Services Capacity Building (NPCSCB) is to improve the human resource management practices of the government and use state-of-the-art infrastructure to enhance the capacity of civil servants.

• It is a Technical Aided (IGOT Karmayogi) scheme with comprehensive coverage of Central Government employees at all levels.

• Capacity building will involve civil servants in Indian culture while learning best practices across the globe.

• A Special Purpose Vehicle will be set up under Section 8 of the Companies Act 2013.

Additional Information

• Mission Rakshak is a campaign launched by ABPV to stop the spread of covid.

• Activities: Thermal screening, distribute masks, encourage people to get themselves vaccinated.

Q83. Answer: (b) Article 15

The correct answer is Article 15.

• Article 15 of the Constitution of India details 'Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth'.

Important Points

• Article 15 (Prohibition of Discrimination on the grounds of religion, race, caste, sex, or place of birth):

• (1) The State shall not discriminate against any citizen on grounds of religion, race, caste, sex, or place of birth.

• (2) No citizen shall be subject to any disability, liability, restriction, or condition on grounds of religion, race, caste, sex, or place of birth.

• (a) Access to shops, public restaurants, hotels, and places of public entertainment.

• (b) the use of dedicated wells, tanks, bathing ghats, roads, and places of public resort for the use of the general public.

• (3) Nothing in this article shall prevent the State from making any special provision for women and children.

• (4) Nothing in this article or clause (2) of Article 29 shall prevent the State from making any special provision for any socially or educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes.

Additional Information

Article	Details
Article 10	• Continuance of Rights of citizenship- Every citizen who is OR deemed to be a citizen of India or any of the foregoing provisions of this part shall subject to the provisions of any law that may be made by the parliament, continue to be a citizen.
Article 22	• It is a fundamental right that safeguards the rights of the individuals who have been arrested and detained for committing an offense.
Article 27	• Freedom as to payment of taxes for the promotion of any particular religion.

Q84. Answer: (a) 32

The correct answer is 32.

• An IP address consists of 32 bits.

Key Points

• An Internet Protocol address (IP address) is a numerical label such as 192.0.2.1 associated with a computer network that uses the Internet Protocol for communication. IP addresses perform two main functions: network interface identification and location addressing.

• Internet Protocol version 4 (IPv4) defines an IP address as a 32-bit number. However, due to the development of the Internet and the lack of available IPv4 addresses, a new version of IP (IPv6) was standardized in 1998, using 128 bits for the IP address. IPv6 deployment has been around since the mid-2000s.

• IP describes a set of standards and requirements for creating and transmitting the data packets or datagrams across networks.

• The two main functions include interface identification and location addressing.

• IP addresses are binary numbers but are typically expressed in decimal forms or Hexadecimal forms to make reading and using them easier for humans.

Q85. Answer: (d) Lemon - Lactic Acid

The correct answer is Lemon - Lactic Acid.

• Lemon juice and lime juice are rich sources of citric acid, containing 1.44 and 1.38 g/oz, respectively.

Key Points

• Lactic acid is an organic acid. Its molecular formula is CH3CHCOOH.

• It is white in solid-state and miscible with water.

• When in the dissolved state, it forms a colorless solution.

• Production involves both artificial syntheses as well as natural sources.

• It is often found in spicy foods, fermented soy products, salami, yogurt, etc.

Important Points

• Oxalic Acid is an organic acid.

• Uses: Acid rinse in laundries, Cleaning agent, tooth whitening process.

• Citric acid is a weak colorless organic acid.

• Uses: Antioxidant, emulsifying agent in ice creams, flavoring agent.

• Acetic acid is a colorless liquid and organic compound.

• Uses: Testing blood in clinical laboratory, treatment of outer ear infections, As a solvent for many industrial processes.

Q86. Answer: (b) Banawali

The correct answer is Banawali.

• Terracotta models of the plough were excavated in Banawali, Harappan civilization.

• Banawali is situated in Fatehabad district, Haryana.

Important Points

• The Indus Valley Civilization was established around 3300 BC. It flourished between 2600 BC and 1900 BC (the mature Indus Valley Civilization). It began to decline around 1900 BC and disappeared around 1400 BC.

• It is also called Harappan Civilization after the first excavated city Harappa (Punjab, Pakistan).

• Pre-Harappan civilization found at Mehrgarh in Pakistan shows the first evidence of cotton cultivation.

• Geographically, this civilization covered Punjab, Sindh, Balochistan, Rajasthan, Gujarat and western Uttar Pradesh. It extended from Sutkagengor (in Balochistan) in the west to Alamgirpur (Western Uttar Pradesh) in the east; and from Mandu (Jammu) in the north to Daimabad (Ahmednagar, Maharashtra) in the south. Some Indus Valley sites have also been found as far away as Afghanistan and Turkmenistan.

Q87. Answer: (d) Louise Glück

The correct answer is Louise Glück.

• Louise Glück was awarded the Nobel prize in Literature.

• She won Nobel Prize in Literature 2020 for "her unmistakable poetic voice that with austere beauty makes individual existence universal".

Additional Information

• The Nobel Prize in Physics 2020

• Roger Penrose

• “for the discovery, that black hole formation is a robust prediction of the general theory of relativity”

• Reinhard Genzel

• “for the discovery of a supermassive compact object at the center of our galaxy”

• Andrea Ghez

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• “for the discovery of a supermassive compact object at the center of our galaxy”
• The Nobel Peace Prize 2020
• World Food Programme (WFP)

Important Points

• The Nobel Prize in Physics 2021
• Syukuro Manabe
• “for the physical modelling of Earth’s climate, quantifying variability and reliably predicting global warming”
• Klaus Hasselmann
• “for the physical modelling of Earth’s climate, quantifying variability and reliably predicting global warming”
• Giorgio Parisi
• “for the discovery of the interplay of disorder and fluctuations in physical systems from atomic to planetary scales”

Q88. Answer: (a) Manika Batra

The correct answer is Manika Batra.

• Manika Batra is the first table tennis player to win the Rajiv Gandhi Khel Ratna Award.

Key Points

• Manika Batra an Indian table tennis player hails from Narain Vihar, Delhi.
• She is the top-ranked table tennis player in India and ranked 50th in the world as of February 2022.
• Other Awards: Dhyan Chand Khel Ratna Award.

Additional Information

• Poulomi Ghatak an Indian table tennis player hails from West Bengal India who won three national junior champions.
• Soumyajit Ghosh an Indian table tennis player hails from West Bengal India is the youngest player to qualify for London 2012 Olympics.
• Sharath Kamal an Indian table tennis player hails from Tamil Nadu was awarded Padma Shri in the year 2019.
• He was the first Indian table tennis player to become nine times senior national champion.
• He also received Arjuna Award in the year 2004.

Q89. Answer: (b) lachrymal

The correct answer is lachrymal.

• Onions produce the chemical irritant known as syn-propanethial-S-oxide; this stimulates the eyes' Lachrymal glands which release tears.

Important Points

• Onion is a vegetable that is mostly cultivated species of genius Allium.
• syn-propanethial-S-oxide is a volatile liquid, its aerosol stimulates nerves in the eyes.
• Chopping of onion causes damage to the cells, the breakdown of amino acid sulfoxides generates sulfenic acid.
• Propene sulfenic acid is rapidly acted on by lacrimatory factor synthase producing syn-propanethial-S-oxide, which diffuses and activates sensory neurons(in eyes).

Additional Information

Name	Details
Parotid	• The gland is present in mouth(upper part of cheek or beneath ears) and are the largest of salivary glands. - The ducts of this gland help empty saliva into the mouth.
lachrymal	• It is an almond-shaped structure. - They are paired exocrine glands one in each eye. - It is situated in the eye socket underneath the upper eyelid.
submandibular	• It is as the size of a walnut and second-largest salivary glands
Sublingual	• It is one among the salivary glands

Q90. Answer: (c) 1580

The correct answer is 1580.

• In 1580 Akbar analyzed the state revenue statistics of the last 10 years, which contained information on price fluctuations and land productivity and averaged crop yield and prices for different regions of his empire.

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Important Points

• Jalal-ud-din Muhammad Akbar was crowned in 1556 at the very young age of 13 years.

• Art and Architecture: Fatehpur Sikri, Jama Masjid(UP) and its Gateway Buland Darwaza.

• The land revenue system of Akbar was known as Zabti or Bandobasth system.

• The land was classified as Polaj, Parauti, Chachar, Banjar.

• Mansabdari system: The nobility and Army were organized by the system.

• Jagirdari system: Assigning the revenue of particular territory to nobles for their services to the states.

Q91. Answer: (b) Igor Stimac

The correct answer is the Godavari.

• Purna, Manjira and Pranhita are tributaries of Godavari.

Key Points

• Godavari is India's second-longest river after Ganga and the third largest in India.

• It originates in Trimbakeshwar, Nashik, Maharashtra, and empties into the Bay of Bengal.

• Geography of the river: Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, Odisha.

• Major Right bank tributaries: Pravara, Manjira, Manair,

• Major Left bank tributaries: Purna, Pranahita, Indravati, Sabari.

Additional Information

Rivers	Details
Indus	• The trans-Himalayan river originates in western Tibet. - Important tributaries: Gilgit, Beas, Chenab, Jhelum, Ravi, Sutlej, Zaskar, Shyok.
Chambal	• Chambal is a part of the greater Gangetic drainage system. - It originates at Janapav, South of Mhow town on the south slope of the Vindhyan range in Madhya Pradesh. - It is a tributary of the Yamuna river. - Important tributaries: Parbati, Kali, Sindh, Shipra, Banas, Mej
Yamuna	• It originates in Yamunotri Glacier, Uttarakhand. - It is a tributary of the Ganga. - Important tributaries: Hindon, ken, Chambal, Sindh, Tons, Betwa, Sasur Khadheri.

Q92. Answer: (c) Mumbai Indians

The correct answer is Mumbai Indians.

• Mumbai Indians has won the Indian Premier League (IPL) trophy five times as of November 2020.

Important Points

• Mumbai Indians are a franchise cricket team based in Mumbai, Maharashtra that competes in the Indian Premiere League.

• Chennai Super Kings is a franchise cricket team based in Chennai, Tamil Nadu that competes in the Indian Premiere League.

• Sunrisers Hyderabad are a franchise cricket team based in Hyderabad, Telangana that competes in Indian Premiere League.

• Rajasthan Royals are a franchise cricket team based in Jaipur, Rajasthan that competes in Indian Premiere League.

Additional Information

• Indian Premiere League was founded by BCCI in 2007.

• The Board of Control for Cricket in India is the governing body for cricket in India and is under the jurisdiction of the Ministry of Youth Affairs and Sports, Government of India.

• It is an autonomous organization and does not come under the National Sports Federation of India.

• Founded in December 1928.

Q93. Answer: (c) Qutb al-Din Aibak

The correct answer is Qutb al-Din Aibak.

Key Points

• Qutb al-Din Aibak began the construction of Qutub Minar, in honour of the famous Sufi Saint, Khwaja Qutubuddin Bakhtiyar Kaki.

• He also constructed two mosques, Quwwat-ul- Islam in Delhi and Adhai din ka Jhonpra in Ajmer.

• He patronized writers like Hasan-ul Nizami, author of Taj-ul-Massir, and Fakhruddin, author of Tarikh-i-Mubarak Shahi.

Additional Information

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• Akbar was one of the mightiest kings of the Mughal Era.
• He was crowned at a very young age at Kalanaur in Punjab.
• Art and Architecture: Fatehpur Sikri, Red sandstone fort at Agra, Jahangir Mahal.
• He founded Din-i-ilahi in the year 1582 to bridge the gap between all religions.
• Jahangir was the fourth Mughal emperor and the son of Akbar.
• Sir Thomas Roe an English man secured a permission letter from Jahangir to establish a factory in India.
• Qutb al-Din Aibak was the general of Muhammad Ghori.
• He started the construction of the first Islamic Monuments of North India Quwwat-ul-Islam.
• He was known as Lakh Bash (giver of Lakhs)
• Iltutmish was the son-in-law of Qutb al-Din Aibak.
• He is considered an effective founder of the Delhi Sultanate.
• He introduced the Iqtadari system where the kingdom was divided into iqtas and assigned to nobles in exchange for salaries.
• He completed the construction of Quwwat-ul-Islam and Qutub Minar.

Q94. Answer: (b) National Sample Survey Organisation

The correct answer is National Sample Survey Organisation.

Important Points

• National Sample Survey Organisation was the largest organization in India conducting periodic socio-economic surveys.
• It was established in the year 1950.
• It comes under the Ministry of Statistics of the Government of India.

Additional Information

Name	Details
National Council of Applied Economic Research	• It is a New Delhi-based non-profit think tank of economics. - Nandan Nilekani is the president of the governing body and Poonam Gupta is the current director-general of NCAER
Niti Aayog	• It is the apex Public Policy think tank of the Government of India. - Formed on 1 January 2015. - Its headquarters is in New Delhi.
National Institution of Economic and Social Research	• It is the British oldest independent economic research institute established in 1938 - Its headquarters is located in London, United Kingdom

Q95. Answer: (c) Principals of Liberty, Equality and Fraternity - Canadian Constitution

The correct answer is Principals of Liberty, Equality, and Fraternity - the Canadian Constitution.

Important Points

• Dr. Ambedkar the principal architect of the constitution of India recognizes liberty, equality, fraternity.
• He said" Liberty cannot be divorced from equality, and equality cannot be divorced by liberty and equality and Liberty cannot be divorced from fraternity.
• The principles were borrowed from the French constitution.

Additional Information

• Fundamental Rights: They are known as the Magna Carta of India Constitution.
• The Charter of Fundamental Rights is borrowed from the Constitution of the United States.
• They are enshrined in part 3 of the Indian Constitution.
• Article (12-35) constitute Fundamental Rights.
• The six fundamental rights include Right to Equality (Articles 14-18), Right to Freedom (Articles 19-22), Right against Exploitation (23-24), Right to Freedom of Religion (25-28), Cultural and Educational Rights 29-30), Right to Constitutional Remedies (Article 32).
• Directive Principles of State Policy: The Source of DPSP originates from Spanish Constitution, Indian Consitution borrowed them from Irish Constitution.
• They are Enshrined in Part 4 of the Indian Consitution.
• Article (36-51) constitutes DPSP.
• They are classified as Socialist principles, Gandhian principles, Liberal and Intellectual principles.
• Rule of Law: It was borrowed from British Constitution.

• It is nowhere defined in the Indian Constitution.

• Rule of Law states that Law is supreme, All citizens are equal before the law, no one can be above the law.

Q96. Answer: (b) INS Himgiri

The correct answer is INS Himgiri.

• INS Himgiri was launched on 14 December 2020 in Kolkata.

• INS Himgiri is the second ship of the Nilgiri class stealth-guided missile frigates being built for the Indian Navy by Garden Reach Shipbuilders and Engineers.

• The ship was laid down on 10 November 2018 and was launched on 14 December 2020.

• The ship is expected to be commissioned by August 2023.

Important Points

• INS Kolkata is the leadership of the Kolkata-class stealth guided-missile destroyers of the Indian Navy.

• It was constructed at Mazagon Dock Limited.

• INS Jalashwa is an amphibious transport dock in service with the Indian Navy.

• INS Shardul is the lead ship of the Shardul-class amphibious warfare vessels of the Indian Navy.

• It was built by Garden Reach Shipbuilders and Engineers.

Q97. Answer: (d) Alkap

The correct answer is Alkap.

• Alkap is a dance form of West Bengal where there is a confluence of dancing, singing, drama and recital.

Important Points

Dances	Details
Hudo	• It is one of the folk dances of Gujarat. - It is a dance of the Bharwad Tribe.
Tippani	• It is one of the folk dances of Gujarat. - It is originated from the Chorwad and Veraval region of Saurashtra.
Bhavai	• It is one of the folk theatres of Gujarat. - It is originated in the 14th century. - Asaita Thakur is credited for its origin.
Alkap	• It is a Bengali folk popular in West Bengal. - Kaap means Kavya and Aal means part of the verse.

Q98. Answer: (a) Silent Valley

The correct answer is Silent Valley.

• Silent Valley is NOT located in Himachal Pradesh.

Key Points

• Silent Valley National park is located in Kerala.

• It is located in Niligiri Hills.

• It is located in the Palakkad district of Kerala and the Niligiri district of Tamil Nadu.

• Kuntipuzha river drains for 15 km in the park from north to south.

• Mudugar and Irula tribal are indigenous people.

• The Chumbi Valley, called Dromo or Tromo in Tibetan, is a valley in the Himalayas that projects southwards from the Tibetan plateau, intervening between Sikkim and Bhutan.

• Malana is an ancient Indian village in the state of Himachal Pradesh.

Q99. Answer: (d) Loni

The correct answer is Loni.

• India's longest LPG pipeline is from Jamnagar to Loni.

Key Points

• The LPG pipeline is the longest in the world.

• It is India's first cross-country pipeline.

• It passes through Gujarat, Rajasthan, Haryana, Delhi, UP.

Additional Information

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• Hazira-Vijaipur-Jagsishpur (HVJ) is India's first cross-state gas pipeline.
• The project was started in 1986.
• States: Gujarat, Rajasthan, Haryana, Delhi, UP, Madhya Pradesh
• Namrup is a small town situated close to Patkai hills in the extreme southeastern part of Assam, India.
• Namrup Thermal Power Plant is situated in Assam.

Q100. Answer: (b) transistors

The correct answer is transistors.

• Second-generation computers (1955-1964) were made of transistors.

Key Points

• Vacuum tube – an electronic device that controls the flow of electrons in a vacuum. It is used as a switch, amplifier, or display screen in many older model radios, televisions, computers, etc.

• Transistor – an electronic component that can be used as an amplifier or as a switch. It is used to control the flow of electricity in radios, televisions, computers, etc.

• Integrated circuit (IC) – a small electronic circuit printed on a chip (usually made of silicon) that contains many its own circuit elements (e.g. transistors, diodes, resistors, etc.).

• Microprocessor – an electronic component held on an integrated circuit that contains a computer's central processing unit (CPU) and other associated circuits.

Important Points

Five Generations of Computers

Generations of computers	Evolving hardware
First-generation	Vacuum tube
Second generation	Transistor
Third generation	Integrated circuit
Fourth generation	Microprocessor
Fifth-generation	Artificial intelligence

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