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Railway Recruitment Boards (RRBs)

Assistant Loco Pilot & Technician

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STAGE-I

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Authors

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Deepali, Shweta Bhargava

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SUCCESS AND NOTHING LESS

(RRBs) Assistant Loco Pilot (ALP) and Technician

Key Features

Coverage of Papers of 2018 to 2010 Years

This book contains Loco Pilot & Technician related papers from 2018 to 2010 years as conducted by Railway Recruitment Boards (RRBs).

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Authentic answer key issued by the Board, is provided at the end of each paper.

Detailed Explanation for All Papers

A detailed explanation for all MCQs asked in papers, have been provided so that the students can get the accurate information related to answers.

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Railway Recruitment Boards (RRBs)

Assistant Loco Pilot (ALP)

COMPUTER BASED TEST 2024

Opening date of application	20.01.2024
Closing date for Submission of Application	19.02.2024 (23.59 hours)
Dates for Modification window for corrections in application form with payment of modification fee (Please Note: Details filled in 'Create an Account form and Chosen RRB cannot be modified)	20.02.2024 to 29.02.2024

Post	Pay Level in 7th CPC	Initial pay (Rs.)	Medical Standard	Age as on 01.07.2024	Total Vacancies (All RRBs)
Assistant Loco Pilot (ALP)	Level-2	19900	A-1	18-30 years	5696

RRB WISE RAILWAY WISE SUMMARY OF VACANCIES

S. No.	RRB	Rly	UR	SC	ST	OBC	EWS	Total	EXSM
1	AHMEDABAD	WR	95	37	17	65	24	238	24
2	AJMER	NWR	86	32	13	72	25	228	22
3	BENGALURU	SWR	186	72	35	127	53	473	47
4	BHOPAL	WCR	145	25	19	21	9	219	22
		WR	35	5	0	18	7	65	7
5	BHUBANESWAR	ECoR	104	42	51	65	18	280	28
6	BILASPUR	CR	57	0	13	44	10	124	12
		SECR	483	179	89	322	119	1192	119
7	CHANDIGARH	NR	42	2	4	12	6	66	6
8	CHENNAI	SR	57	33	15	29	14	148	15
9	GORAKHPUR	NER	18	7	3	11	4	43	4
10	GUWAHATI	NFR	26	9	4	17	6	62	6
11	JAMMU-SRINAGAR	NR	15	6	3	11	4	39	4
12	KOLKATA	ER	155	37	19	23	20	254	26
		SER	30	11	23	20	7	91	9
13	MALDA	ER	67	19	20	25	30	161	16
		SER	23	8	4	15	6	56	6
14	MUMBAI	SCR	10	4	2	7	3	26	3
		WR	41	16	8	30	15	110	11
		CR	179	58	37	95	42	411	41
15	MUZAFFARPUR	ECR	15	5	3	11	4	38	4
16	PATNA	ECR	15	6	3	10	4	38	4
17	PRYAGRAJ	NCR	163	13	10	27	28	241	25
		NR	21	7	3	12	2	45	5
18	RANCHI	SER	57	32	10	38	16	153	16
19	SECUNDERABAD	ECoR	80	30	15	54	20	199	20
		SCR	228	85	40	151	55	559	56
20	SILIGURI	NFR	27	10	5	18	7	67	7
21	THIRUVANANTHAPURAM	SR	39	14	14	1	2	70	7
			2499	**804**	**482**	**1351**	**560**	**5696**	**572**

RECRUITMENT PROCESS & SYLLABUS

RECRUITMENT PROCESS

(a) A candidate can apply to only one RRB and only ONE ONLINE application has to be submitted.

(b) The recruitment process shall comprise of the following stages
   (i) First Stage CBT (CBT-1)
   (ii) Second Stage CBT (CBT-2)
   (iii) Computer Based Aptitude Test (CBAT)
   (iv) Document Verification (DV) and
   (v) Medical Examination (ME)

(c) Information on examination schedule and venues will be given in due course through officers RRB websites, SMS and email.

(d) Request for postponement of any of the stages or for change of venue, date and shift will not be entertained under any circumstances.

FIRST STAGE CBT (CBT-1)

(a) CBT-1 will only be a screening exam for shortlisting eligible candidates for CBT-2 based on their normalised marks and merit.

(b) The marks of CBT-1 shall not be counted while preparing the final panel.

(c) Candidates belonging to OBC/SC/ST who are shortlisted for CBT-2 by availing relaxed standards of age shall continue to be treated as candidates of their respective reserved communities only for all subsequent stages of this recruitment process.

(d) **Pattern & Syllabus of CBT-1**
   (i) Duration: 60 minutes
   (ii) Number of questions: 75, Maximum marks: 75 (@1 mark per question)
   (iii) There shall be negative marking @1/3rd marks for each wrong answer.
   (iv) Normalisation of marks will be done for CBTs held in multiple shifts.
   (v) Minimum pass percentage for eligibility: UR & EWS-40%, OBC (NCL)-30%, SC-30% ST- 25%
   (vi) The standard of questions for CBT-1 will generally be in conformity with the educational standards and/or minimum technical qualifications prescribed for the post. Questions will be of objective type with multiple choice answers and are likely to cover topics pertaining to the following syllabus.
      (A) **Mathematics**: Number system, BODMAS, Decimals, Fractions, LCM, HCF, Ratio and Proportion, Percentages, Mensuration, Time and Work, Time and Distance, Simple and Compound Interest, Profit and Loss, Algebra, Geometry and Trigonometry, Elementary Statistics, Square Root, Age Calculations, Calendar & Clock, Pipes & Cistern etc.
      (B) **Mental Ability**: Analogies, Alphabetical and Number Series, Coding and Decoding. Mathematical operations, Relationships, Syllogism, Jumbling, Venn Diagram, Data Interpretation and Sufficiency, Conclusions and Decision Making, Similarities and Differences, Analytical reasoning, Classification, Directions, Statement-Arguments and Assumptions etc.
      (C) **General Science**: The syllabus under this shall cover Physics, Chemistry and Life Sciences of 10th standard level.
      (D) **General Awareness**: Current affairs, Science & Technology, Sports, Culture, Personalities, Economics, Politics and other subject of importance.

SOLVED PAPER 2018

31st August (Shift I)

Railway Recruitment Boards (RRBs)

Assistant Loco Pilot (ALP) & Technician

DIRECTIONS

1. This question paper consists of 75 objective type questions, to be completed in 60 min.
2. This paper will consist questions related to Mathematics, Intelligence, General Science and General Awareness.

1. A section of DNA that provides information for one protein is called the ..... .
(a) lysosome (b) gene
(c) chromosome (d) nucleus

2. Which actor plays the role of social activist Arunachalam Muruganantham in the biopic movie 'Pad Man'?
(a) Irrfan Khan
(b) Nana Patekar
(c) Mohanlal
(d) Akshay Kumar

3. Using the sequence VWY9PONI5FSLUDTG61AJ, find the term missing from the following series.
YP,....., 5S, LD
(a) PN (b) OI
(c) OT (d) N5

4. Acids that contain hydrogen and other non-metallic element(s), except oxygen, are called
(a) Hydracids (b) Dilute acids
(c) Strong acids (d) Weak acids

5. What is the percentage of methane in biogas?
(a) 90% (b) 80%
(c) 60% (d) 75%

6. Solve the following.
$196 - 19.6 - 1.96 - 0.196 = ?$
(a) 173.254 (b) 173.234
(c) 174.234 (d) 174.244

7. Which of the following is an anthropology museum that presents an integrated story of the evolution of man and culture with special reference to India?
(a) The Indira Gandhi Sangrahalaya (IGS)
(b) The Indira Gandhi Jantu Sangrahalaya (IGJS)
(c) The Indira Gandhi Pustak Sangrahalaya (IGPS)
(d) The Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS)

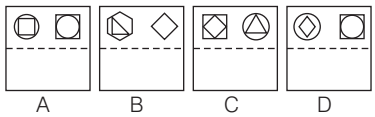
8. Which of these rivers primarily flows in South Africa?
(a) Nile River (b) Orange River
(c) Niger River (d) Congo River

9. Among the following which is a rational number?
(a) $\sqrt[2]{32}$ (b) $\sqrt[5]{32}$
(c) $\sqrt[4]{32}$ (d) $\sqrt[6]{32}$

10. Select the option that depicts the following transparent sheet (problem figure) when folded at the dotted line shown.

Problem Figure

Answer Figures



(a) C (b) B (c) D (d) A

11. Which part of the brain regulates breathing?
(a) Cerebellum
(b) Medulla
(c) Fore-brain
(d) Mid-brain

12. Consider the given statement and decide which of the given assumptions is (are) implicit in the statement.

Statement

During an exam, an invigilator said, "if anyone tries to copy, I will cancel their exam."

Assumptions

I. Some students copy during exams.

II. Students will not copy during exams.

(a) Only Assumption II is implicit.
(b) Only Assumptions I is implicit.
(c) Either Assumption I or II is implicit.
(d) Both Assumptions I and II are implicit.

13. Who is the CEO of Cognizant Technology Solutions as of February 2018?

(a) Francisco D'Souza
(b) Azim Premji
(c) Nandan Nilekani
(d) Vishal Sikka

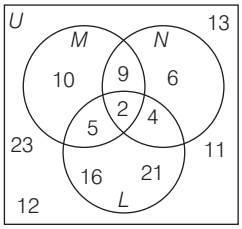
14. Primary growth in plants occurs by

A. vertical meristem
B. lateral meristem
C. intercalary meristem
D. apical meristem

(a) C and D (b) A, B and D
(c) A, B, C and D (d) B, C and D

15. In the given diagram, Set *U* is the universal set and Set *L*, *M* and *N* represent students studying History, Geography and Language, respectively.

What is the total number of students studying History and Geography but not Language?



(a) 7 (b) 2 (c) 5 (d) 12

16. Name the Indian golfer who won the Royal Cup Pattaya on 31st December, 2017. This was his third Asian Tour title of 2017.

(a) Khalin Joshi
(b) Jyoti Randhawa
(c) Shiv Kapur
(d) Gaganjeet Bhullar

17. Name the former world silver medallist representing Manipur who claimed gold in the 48 kg category at the 2018 National Women's Boxing Championships in Rohtak.

(a) Sravanthi Naidu
(b) Sarjubala Devi
(c) Shobha Pandit
(d) Mithali Raj

18. Select the option that correctly matches the contents of the first column with the contents of the second column.

A.	Elements combine in fixed ratio	I.	Dalton's atomic theory
B.	Atoms are indivisible	II.	The same number of molecules
C.	Sulphate and oxalate ions are anions, whereas magnesium and	III.	Law of constant proportions
D.	Gram atomic mass of an element and the gram molecular mass of a compound contain	IV.	Ammonium ions are cations

(a) A-III, B-II, C-IV, D-I
(b) A-III, B-I, C-IV, D-II
(c) A-III, B-IV, C-I, D-II
(d) A-I, B-III, C-IV, D-II

19. The following table gives the details of the number of students in Class 10. Sections A and B, who had taken their mid-term and final exams.

Result	Section A	Section B
Total number of students who failed in both the exams	28	23
Number of students who failed in the mid-term but passed in the final exam	14	12
Number of students who passed in the mid-term but failed in the final exams	6	17
Number of students who passed in both the exams	64	55

Based on the given data, the percentage of Section A students who passed the annual exam is ..... .

(a) 69.69
(b) 69.54
(c) 69.70
(d) 69.64

20. Which of the below given fractions is not equal to $\frac{9}{17}$?

(a) $\frac{153}{289}$ (b) $\frac{108}{221}$
(c) $\frac{63}{119}$ (d) $\frac{27}{51}$

21. In a class, 60% of children like Mathematics, 45% like Science and 25% like both Mathematics and Science. What is the percentage of children who like at least one subject?

(a) 70% (b) 80% (c) 45% (d) 55%

22. Name the character in Mahabharata who was blessed with the 'divine vision' to see the Mahabharata battle and explain it scene by scene to the blind king Dhritarashtra.

(a) Sanjaya (b) Dussala
(c) Vidura (d) Balarama

23. Which of the following statements is wrong with regard to strong acids?

(a) Strong acids react very rapidly with other substances (such as metal carbonates and metal hydrogen carbonates).
(b) Hydrochloric acid, sulphuric acid and nitric acid are strong acids.
(c) Acids are those chemical substances that have a salty taste.
(d) All minerals acids are strong acids.

24. The denominator of a rational number exceeds its numerator by 10. If the numerator is increased by 4 and the denominator is reduced by 3, the number obtained is $\frac{5}{6}$. The original rational number is

(a) $\frac{11}{21}$ (b) $\frac{7}{17}$ (c) $\frac{9}{19}$ (d) $\frac{13}{23}$

25. Consider the given statement to be true and decide which of the suggested courses of action logically follow(s) on the basis of the information given in the statement.

Statement

The pollution and air quality in Delhi is beyond the acceptable level. This is due to industrial and automobile exhaustion.

Courses of Action

I. Automobiles should be divided into groups to be run only on odd and even days, respectively.

II. The government should stop the registration of new factories and vehicles.

(a) Only II follows.
(b) Both I and II follow.
(c) Neither I nor II follow.
(d) Only I follows.

26. The Dhola-Sadiya Bridge, dedicated to the nation by Prime Minister Narendra Modi, is built across which river?
(a) Narmada River
(b) Yamuna River
(c) Lohit River
(d) Ganges River

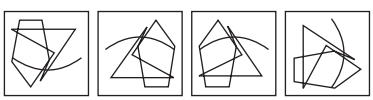
27. The latest issued bank notes in the denomination of ₹ 50 by RBI have what motif on their reverse side?
(a) Sanchi Stupa
(b) Red Fort
(c) Mangalyaan
(d) Stone chariot of Hampi

28. An element A forms an oxide with formula A_3O_4. What is the valency of element A?
(a) 3 (b) 2
(c) 1 (d) 4

29. If a rod of length $208\frac{4}{5}$ is cut into equal pieces of length $23\frac{1}{5}$, then the total number of rods obtained is
(a) 5 (b) 8
(c) 9 (d) 7

30. The centre of the reflecting surface of a spherical mirror is a point called the ……. .
(a) pole (b) focus
(c) radius (d) aperture

31. Select the option that depicts the correct mirror image of the following figure.



(a) (b) (c) (d)

32. Select the missing number based on the given related pair of numbers.
158 : 384 : : 140 : ……
(a) 347 (b) 346
(c) 348 (d) 349

33. What will be the 20th term in the given sequence?
–50,–47,–44, ……
(a) –10 (b) 10
(c) –7 (d) 7

34. The distance between two places can be covered in $3\frac{1}{2}$ hours at a speed of 62 km/hr. If the speed is increased by 8 km/hr, how much time would be saved?
(a) 20 min (b) 24 min
(c) 15 min (d) 30 min

35. By selling an item for ₹ 696 Unnati incurred a loss of 13%. By how much should she have raised the price to gain a profit of 10%?
(a) ₹ 160.08 (b) ₹ 104
(c) ₹ 84 (d) ₹ 184

36. Select the incorrect set of Molecular Formula – IUPAC Name – Common Name from the following options.
(a) C_4H_9OH - Butanol - Butyl Alcohol
(b) C_2H_3OH - Methanol - Methyl Alcohol
(c) C_2H_5OH- Ethanol - Ethyl Alcohol
(d) C_3H_7OH-Propanol- Propyl Alcohol

37. If $\Delta ABC \cong \Delta XYZ$ and angle BAC = 55°, then angle ZXY = ?
(a) 67.5° (b) 135° (c) 65° (d) 55°

38. Three triangles are marked out of a bigger triangle at the three vertices such that each side of each of the smaller triangles is one-fourth as long as each corresponding side of the bigger triangle. The ratio of the area of the three small triangles taken together to that of the rest of the bigger triangle is
(a) 4 : 15 (b) 3 : 13
(c) 3 : 16 (d) 1 : 5

39. The sum of the lengths of the edges of a cube is equal to four times the perimeter of a square. If a quarter of the numerical value of the volume of the cube is equal to the numerical value of the area of the square, then the length of one side of the square is
(a) $\frac{27}{16}$ units
(b) 10.5 units
(c) $\frac{9}{4}$ units
(d) 27 units

40. The maximum number of electrons that can be accommodated in a shell is indicated by the formula
(a) $2n^{-2}$ (b) $2n^3$
(c) $2n$ (d) $2n^2$

41. If a person bought an item for ₹ 96 and sold it at a profit of 12.5%, the selling price of the item was
(a) ₹ 105 (b) ₹ 110
(c) ₹ 108 (d) ₹ 112

42. 35% of an alloy was silver. If in the quantity of alloy there was 119 g of silver, what was the quantity of the other elements in the alloy?
(a) 273 g (b) 204 g
(c) 221 g (d) 340 g

43.

The above figure is embedded in any of these four figures. The correct figure containing the above figure is

A B C D

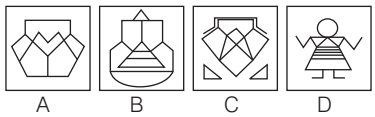
(a) C (b) A
(c) D (d) B

44. Facing North, X turns 205° clockwise and then 160° anti-clockwise. Which direction is X facing now?
(a) North-West (b) South - East
(c) South-West (d) North-East

45. The given problem figure is embedded in one of the given answer figures. Which is that answer figure?

Problem Figure

Answer Figures



A B C D

(a) D (b) A (c) C (d) B

46. Pinaki is 9 yr younger than Bhaswati. 13 yr hence Bhaswati will be 1.2 times as old as Pinaki. Find Pinaki' present age.
(a) 28 yr (b) 32 yr
(c) 33 yr (d) 30 yr

47. Sunil started his journey at 2 : 33 : 34 p.m. and reached the destination at 4 : 43 : 45 p.m. Anil started the journey 45 min 27 sec after Sunil and reached the destination 37 min 16 sec after him. How long did Anil take to complete his journey?
(a) 1 h 59 min
(b) 2 h 2 min
(c) 2 h 1 min 12 sec
(d) 2 h 2 sec

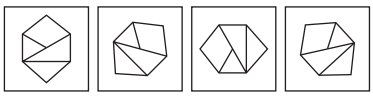
48.

Stu/Sub	P	C	B	M
W	70	90	50	85
X	55	80	95	60
Y	60	20	90	40
Z	90	80	40	65

The given table represents the marks obtained by four students W, X, Y and Z in four subjects P,C,B and M, with the maximum marks in each subject being 100.
Based on the given data, the student who got the lowest percentage in P, C, M and B, combined is
(a) Y (b) X
(c) Z (d) W

49. $4+\frac{1}{6}\times[\{-12\times(24-13-3)\}\div(20-4)\}=?$
(a) 4 (b) 6
(c) 5 (d) 3

50. Select the figure that does not belong in the following group.



A B C D
(a) D (b) A (c) C (d) B

51. A 145 m long train crosses a 655 m long bridge in 36 sec. What is the speed of the train?
(a) 70 km/h (b) 80 km/h
(c) 60 km/h (d) 75 km/h

52. Match the following with the correct response.

1.	W	A	N-m
2.	kW	B	3.6×10^6 J
3.	1 kWh	C	1000 W
4.	1 HP	D	746 W

(a) 1-D, 2-B, 3-C, 4-A
(b)1-A, 2-B, 3-C, 4-D
(c) 1-A, 2-C, 3-D, 4-B
(d) 1-A, 2-C, 3-B, 4-D

53. Consider the given question and decide which of the following statements is sufficient to answer the question.
X took a loan from Y on compound interest. Find the rate per annum.
Statements
I. After 3 yr, X paid ₹ 500 as interest.
II. After 3yr X paid ₹ 1500 to clear his loan with Y.
(a) II alone is sufficient while I alone is not sufficient to answer the question.
(b) I alone is sufficient while II alone is not sufficient to answer the question.
(c) Both I and II are sufficient to answer the question.
(d) Either I or II is sufficient to answer the question.

54. What is the value of acceleration due to gravity on the surface of the earth?
(a) 9.6 m/s^2
(b) 9.8 m/s^2
(c) 10.8 m/s^2
(d) 9.7 m/s^2

55.

Stu/Sub	P	C	B	M
W	70	90	50	85
X	55	80	95	60
Y	60	20	90	40
Z	90	80	40	65

The given table represents the marks obtained by four students W, X, Y and Z in four subjects P, C, B and M, with the maximum marks in each subject being 100.
The average marks of the four students in M is
(a) 62 (b) 62.5
(c) 62.25 (d) 62.75

56. Which of the following elements was the last element in Newland's Law of Octaves?
(a) Thorium (b) Hydrogen
(c) Rubidium (d) Bromine

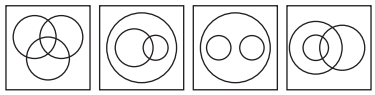
57. Given below are the ages (in years) of a group of children. What is the median age?
7, 9, 8, 6, 5, 3, 9, 2.
(a) 6.5 (b) 5
(c) 6.125 (d) 6

58. … is the most ductile metal.
(a) Ph (b) C
(c) Au (d) Ag

59. Which of the following is not a constituent of biogas?
(a) Carbon Dioxide
(b) Hydrogen Sulphide
(c) Methane
(d) Carbon Monoxide

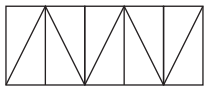
60. ..... present in the centre of a flower, forms the female reproductive part.
(a) Sepals (b) Petals
(c) Carpels (d) Stamens

61. Which of the following diagrams represent the relationship between Male, Husband and Model?



(a) (b) (c) (d)

62. Select the option that represents the number of triangles in the given figure.



(a) 12 (b) 15 (c) 14 (d) 10

63. In the given sequence, if every letter beginning from position 8 from the left is replaced by its next letter in the English alphabet, and Z is replaced by A, then how many Vs will be there in the resulting sequence?
ZUDJKNCXVCSLLIEBSFJVATWQK
(a) 0 (b) 3 (c) 2 (d) 1

64. The forces between two bodies are always equal and opposite. This idea is stated in the form of Newton's
(a) first and second law of motion
(b) first law of motion
(c) third law of motion
(d) second law of motion

65. Consider the given statement to be true and decide, which of the following courses of action logically follow(s) from the statement.
Statement
The manufacturing companies in Tamil Nadu are facing acute power shortage.
Courses of Action
I. Government should take steps to solve the power crisis.
II. Government should shut down manufacturing companies to save power.

(a) Only II follows.
(b) Neither I nor II follow.
(c) Both I and II follow.
(d) Only I follows.

66. The value of
$16-[5-2\{14 \text{ of } 2-(8\div 4\times 2-1+3\}]$ is
(a) -12 (b) -9
(c) 55 (d) -14

67. Select the option that can replace the question mark (?) in the following equation.

$$\frac{(0.2)^3-(0.1)^3}{(0.2+0.1)^2}=?$$

(a) $\frac{1}{18}$ (b) $\frac{3}{40}$
(c) $\frac{-7}{90}$ (d) $\frac{7}{90}$

68. The value of
$14\div\{(5 \text{ of } 2-3)\}\times 4(7-2)$ is
(a) 44
(b) 40
(c) $\frac{1}{10}$
(d) $\frac{14}{19}$

69. Calculate the work done by the force of gravity when a satellite moves in an orbit of radius 40,000 km around the earth.
(a) 8,000 J
(b) 4,00,000 J
(c) 0 J
(d) 4,000 J

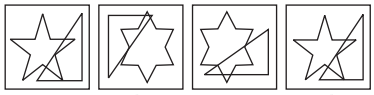
70. Consider the given statement to be true and decide which of the following courses of action logically follow(s) from the statement.

Statement
Due to heavy rain in Bangalore, the normal lives of the citizens are paralysed.

Course of Action
I. Government should take measures to help people and avoid life and property.
II. Government should provide free treatment in all the hospitals of Bangalore.

(a) Both I and II follow.
(b) Neither I nor II follow.
(c) Only II follows.
(d) Only I follows.

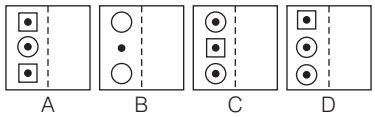
71. Select the option that depicts the correct mirror image of the following figures if the mirror is held at the AB line.


(a) (b) (c) (d)

72. Select the option that depicts the following transparent sheet (Problem Figure) when folded at the dotted line shown.

Problem Figure

Answer Figures


A B C D

(a) A (b) D
(c) B (d) C

73. Bipul is 16 yr younger than Saibal. 12 yr hence, Saibal's age will be 1.5 times that of Bipul. Saibal is now …… yr old.
(a) 36 (b) 42
(c) 45 (d) 40

74. Which ex-cricketer has acted in the movies 'Team 5' and 'Aksar 2'?
(a) S. Sreesanth
(b) Salil Ankola
(c) Zaheer Khan
(d) Mohammad Azharuddin

75. An object of 1.2 cm height is placed 30cm before a concave mirror of focal length of 20 cm to get a real image at a distance of 60 cm from the mirror.
What is the height of the image formed?
(a) –3.6 cm
(b) – 2.4 cm
(c) 1.2 cm
(d) 2.4 cm

Answers

1	*(b)*	2	*(d)*	3	*(b)*	4	*(a)*	5	*(d)*	6	*(d)*	7	*(d)*	8	*(b)*	9	*(b)*	10	*(c)*
11	*(b)*	12	*(d)*	13	*(a)*	14	*(a)*	15	*(c)*	16	*(c)*	17	*(b)*	18	*(b)*	19	*(d)*	20	*(b)*
21	*(b)*	22	*(a)*	23	*(c)*	24	*(a)*	25	*(d)*	26	*(c)*	27	*(d)*	28	*(b)*	29	*(c)*	30	*(a)*
31	*(c)*	32	*(c)*	33	*(d)*	34	*(b)*	35	*(d)*	36	*(b)*	37	*(d)*	38	*(b)*	39	*(a)*	40	*(d)*
41	*(c)*	42	*(c)*	43	*(c)*	44	*(d)*	45	*(a)*	46	*(b)*	47	*(b)*	48	*(a)*	49	*(d)*	50	*(a)*
51	*(b)*	52	*(d)*	53	*(c)*	54	*(b)*	55	*(b)*	56	*(a)*	57	*(a)*	58	*(c)*	59	*(d)*	60	*(c)*
61	*(d)*	62	*(c)*	63	*(a)*	64	*(c)*	65	*(d)*	66	*(c)*	67	*(d)*	68	*(b)*	69	*(c)*	70	*(d)*
71	*(d)*	72	*(d)*	73	*(a)*	74	*(a)*	75	*(b)*										

Hints & Solutions

1. (b) A section of DNA that provides information for one protein is called the gene. A gene is the basic physical and functional unit of heredity.

2. (d) Akshay Kumar plays the role of social activist Arunachalam Muruganantham in the biopic movie 'Pad Man'. Muruganantham Arunachalam designed a small sanitary-pad-making machine. And with it, he scripted a big change in the lives of women across India and many parts of the world.

3. (b) Here, the sequence

V W Y 9 P O N I 5 F S L U D T G 6 I A J

the Pattern is

Y 9 P O N I 5 F S L U D

∴ 'O I' will come in blank place.

4. (a) Acids that contain hydrogen and other non-metallic elements (s) except oxygen are called hydracids. It produces a conjugate base by loss of positive hydrogen ion.

5. (d) The percentage of methane in biogas is 75%. Biogas consists mainly of methane and carbon dioxide. It can also include small amounts of hydrogen sulphide, and some moisture.

6. (d) $196 - 19.6 - 1.96 - 0.196$

$= 196 - (19.6 + 1.96 + 0.196)$

$= 196 - 21.756 = 174.244$

7. (d) The Indira Gandhi Rashtriya Manav Sangrahalaya (IGRMS) is an anthropology museum that presents an integrated story of the evolution of man and culture with special reference to India. It is located in Bhopal, Madhya Pradesh. The museum spread over an area of about 200 acres on Shymala Hill in the city.

8. (b) The Orange river is the longest river (about 2,500 km) in South Africa. It originates from the Drakensberg mountains in Lesotho and flows West and finally drains into the Atlantic Ocean at Alexander Bay. The Orange river extends into Namibia and Botswana.

9. (b) $\sqrt[5]{32} = 2$

Hence, $\sqrt[5]{32}$ is a rational number.

10. (c) Given figure,

When this figure folded at the dotted line, then

Hence, option (c) is correct answer.

11. (b) Medulla oblongata regulates breathing as it is the primary respiratory control center located in hind brain. Its main function is to send signals to the muscles that control respiration to cause breathing occur.

12. (d) "If anyone tries to copy, I will cancel their exam" it means some students copy during exams and students will not copy during exam.

Hence, both assumptions I and II are implicit.

13. (a) Francisco D'Souza was the CEO of Cognizant Technology Solutions as of February 2018. Ravi Kumar S was appointed CEO of Cognizant in January 2023.

14. (a) Primary growth in plants occurs by intercalary meristem and apical meristem. Apical meristems is found at the shoot and root tips of plants and intercalary meristem are found at the base of internodes. Both meristems increase the length of plant by primary growth.

15. (c) From the Venn diagram,

Total number of students studying History and Geography but not Language = 5

16. (c) Shiv Kapur is an Indian golfer who won the Royal Cup at Pattaya on 31st December, 2017. This was his third Asian Tour title of 2017. He shot a bogey-free 68 to share the lead with Prom Meesawat of Thailand after the second round of the USD 5,00,000 Royal Cup. As for the other Indians, Kahlin Joshi (67) moved to T4 and 5-under and at the same position was Gaganjeet Bhullar (71) while Jyoti Randhawa shot 73 and slipped to T35.

17. (b) Sarjubala Devi, the former world silver medallist representing Manipur who claimed gold in the 48kg category at the 2018 National Women's Boxing Championships in Rohtak. Sarjubala Devi also represented India at the 2016 Rio Olympics.

18. (b) Correct match is A-III, B-I, C-IV, D-II.

Elements combine in fixed ratios is called Law of constant proportions.

Atoms are indivisible according to Dalton's atomic theory.

Sulphate and oxalate ions are anions, whereas magnesium and ammonium ions are cations.

Gram atomic mass of an element and the gram molecular mass of a compound contain the same number of molecules.

19. (d) Total number of students in section A

$= 28 + 14 + 6 + 64 = 112$

Total number of students in section A who passed the final exam $= 14 + 64 = 78$

∴ Required percentage $= \frac{78}{112} \times 100$

Here, $= 69.64\%$

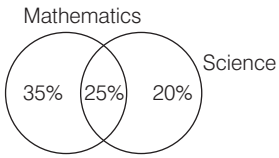
20. (b) $\frac{153}{289} = \frac{9}{17}$

$\frac{108}{221} \neq \frac{9}{17}$

$\frac{63}{119} = \frac{9}{17}, \frac{27}{51} = \frac{9}{17}$

It is clear from the above that $\frac{108}{221}$ is not equal to $\frac{9}{17}$.

21. (b) According to the question,



∴ Percentage of children who like at least one subject= 35 + 25 + 20 = 80%

22. (a) Sanjaya was blessed with the 'divine vision' to see the Mahabharata battle and explain it scene by scene to the blind king Dhritarashtra. The Kurukshetra War is a war described in the Hindu-epic, Mahabharata. The conflict arose between two groups of cousins, the Kauravas and the Pandavas, due to the struggle for dynastic succession to the throne of Hastinapura, in an Indian kingdom called Kuru.

23. (c) Statement (c) is wrong with regard to strong acid.

Acide are those chemical substance that have sour taste because of their hydrogen ion concentration. While testing the tongue gains ions and it registers the flavour as sour.

24. (a) Let numerator = x

∴ Denominator = $x + 10$

According to the question,

$$\frac{x+4}{x+7} = \frac{5}{6}$$

$\Rightarrow \quad 6x + 24 = 5x + 35$

$\therefore \quad x = 11$

∴ Original rational number $= \frac{x}{x+10} = \frac{11}{21}$

25. (d) As per the given statements,

The Automobiles should be divided into groups to be run only an odd and even days. It will be good idea to make the better condition of poor air quality.

And the government should stop the registration of new factories and vehicles. So that, the idea will be proven to reduce the pollution. And improve air quality.

But new factories will be stopped. So, this will be not better decision.

So, only I follows.

26. (c) The Dhola-Sadiya Bridge, dedicated to the nation by Prime Minister Narendra Modi, is built across Lohit river. The Bhupen Hazarika Setu, also referred to as the Dhola-Sadiya Bridge, is a beam bridge in India, connecting the north-east states of Assam and Arunachal

Pradesh. The bridge spans the Lohit river, a major tributary of the Brahmaputra river, from the village of Dhola (Tinsukia district) in the south to Sadiya to the north.

27. (d) The latest issued bank notes in the denomination of ₹ 50 by RBI, have stone chariot of Hampi motif on their reverse side depicting the country's cultural heritage. The base colour of the note is fluorescent blue.

28. (b) An element *A* forms an oxide with formula A_3O_4. Valency of element, *A* is 2.

For example

$$Fe_3O_4 \rightarrow FeO + Fe_2O_3$$

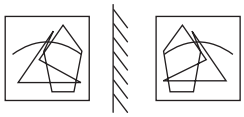
Valency of A(Fe) is 2.

29. (c) Required total number of rods obtained

$$= 208\frac{4}{5} \div 23\frac{1}{5}$$
$$= \frac{1044}{5} \div \frac{116}{5}$$
$$= \frac{1044}{116} = 9$$

30. (a) The centre of the reflecting surface of a spherical mirror is a point called the pole and the principal axis pierces the mirror at this point. It is denoted by the letter P.

31. (c) The correct mirror image of the figure is as follows.



32. (c) As, $158 \times 2 + 68 = 384$

Similarly, $140 \times 2 + 68 = \boxed{348}$

33. (d) Here, $d = -47 + 50 = 3$

$a = -50$

$n = 20$

$T_{20} = ?$

$\therefore \quad T_{20} = a + (n-1)d$

$= -50 + (20-1) \times 3$

$= -50 + 57 = 7$

Hence, 20th term will be 7 in the given sequence.

34. (b) Distance between two places = 62×3.5

$= 217$ km

New time = $\frac{217}{62 + 8} = 3.1$ h

$\therefore$ Saved time = $3.5 - 3.1$

$= 0.4$ h

$= 0.4 \times 60$

$= 24$ min

35. (d) $\therefore$ Cost price of item = $\frac{696}{87} \times 100 =$ ₹ 800

and New selling price = $\frac{800 \times 110}{100} =$ ₹ 880

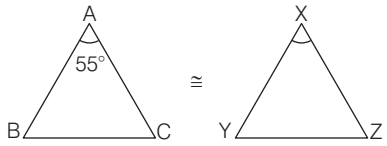
Hence, raised price = $880 - 696 =$ ₹ 184

36. (b) Option (b) is the incorrect set.

Correct set of Molecular Formula-IUPAC Name-Common Name

CH_3OH – Methanol-Methyl Alcohol

37. (d) Given, $\Delta ABC \cong \Delta XYZ$



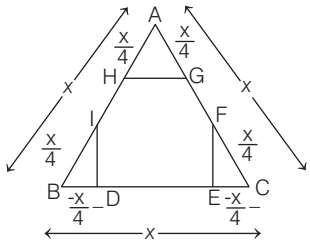
$\Rightarrow \quad \angle A = \angle X, \angle B = \angle Y$ & $\angle C = \angle Z$

So, $\quad \angle A = \angle X = 55°$

$\Rightarrow \quad \angle BAC = \angle ZXY = \boxed{55°}$

38. (b) Let the side of the bigger triangle = x cm

$\therefore$ The side of the smaller triangle = $\frac{x}{4}$ cm



$$\frac{\text{The area of three smaller triangles}}{\text{The area of the rest of bigger traingle}}$$

$$= \frac{3 \times \frac{\sqrt{3}}{4} \times \left(\frac{x}{4}\right)^2}{\left[\left(\frac{\sqrt{3}}{4} \times (x)^2\right) - \left(3x\frac{\sqrt{3}}{4} \times \left(\frac{x}{4}\right)^2\right)\right]}$$

$$= \frac{3 \times \frac{x^2}{16}}{x^2 - 3\left(\frac{x^2}{16}\right)}$$

$$= \frac{\frac{3}{16}}{1 - \frac{3}{16}} = \frac{\frac{3}{16}}{\frac{13}{16}} = \frac{3}{13}$$

$= 3 : 13$

39. (a) Let side of cube = a unit

and side of square = b unit

Sum of length of the edges of cube

= 4 × Perimeter of square

$\Rightarrow \quad 12a = 16b$

$\therefore \quad a = \frac{4}{3}b \quad \ldots(i)$

$\because \quad \frac{\text{Volume of cube}}{4} = \text{Area of square}$

$$\frac{a^3}{4} = b^2$$

Put the value of a, we get

and the principal are/is pierces the mirror at this point. It is denoted by the letter *P*.

$$\frac{\left(\frac{4}{3}b\right)^3}{4} = b^2$$

$\therefore \quad b = \frac{27}{16}$ unit

Hence, the length of one side of square is $\frac{27}{16}$ unit.

40. (d) The maximum number of electron that can accommodate in a shell is given by the formula $2n^2$, e.g. for *M*-shell, $n = 3$, hence *M* can accommodate 18 electrons.

41. (c) $\therefore$ Required selling price = $\frac{96 \times 112.5}{100}$

$=$ ₹ 108

42. (c) Quantity of silver in alloy = 35%

$\therefore$ Quantity% of other elements in alloy = $100 - 35$

$= 65\%$

$\therefore$ Required quantity of other elements

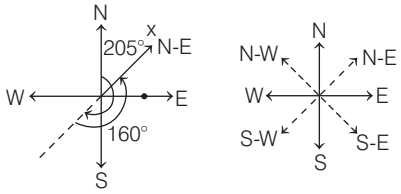
$= \frac{119}{35} \times 65$

$= 221$ g

43. (c)

Hence, question figure is embedded in figure (D).

44. (d) As per the given information, on making the direction figure,



$\therefore X$ is facing now 45° clockwise direction.

45. (a)

Hence, problem figure is embedded in figure (D).

46. (b) Let age of Pinaki = x yr

$\therefore$ Age of Bhaswati = $(x + 9)$ yr

According to the question,

$x + 22 = 1.2(x + 13)$

$\Rightarrow \quad x + 22 = 1.2x + 15.6$

$\therefore \quad 0.2x = 22 - 15.6 = 6.4$

$x = 32$ yr

Hence, present age of Pinaki is 32 yr.

47. (b) Journey time of Sunil

$= 4 : 43 : 45 - 2 : 33 : 34$

$= 2 : 10 : 11$

Difference of journey time of Sunil and Anil

= 45 min 27 sec – 37 min 16 sec

$= 8$ min 11 sec

$\therefore$ Time taken to complete his journey by Anil

$= 2 : 10 : 11 - 0 : 8 : 11$

$= 2$ h 2 min

48. (a) Total marks of W = $70 + 90 + 50 + 85$

$= 295$

Total marks of X = $55 + 80 + 95 + 60 = 290$

Total marks of Y = $60 + 20 + 90 + 40 = 210$

Total marks of Z = $90 + 80 + 40 + 65 = 275$

$\therefore$ Required answer = Y (lowest marks or percentage)

49. (d) Simple expression:

$$4+\frac{1}{6}\times[\{-12\times(24-13-3)\}\div(20-4)]$$
$$=4+\frac{1}{6}\times[\{-12\times8)\}\div16]$$
$$=4+\frac{1}{6}\times[-96\div16]$$
$$=4+\frac{1}{6}\times(-6)=4-1=3$$

50. (a) Expept figure (D), all shapes are moving in clock-wise direction while shape (D) is moving in anti-clockwise direction.

51. (b) Speed of train $=\frac{145+655}{36}=\frac{800}{36}$

$$=\frac{400}{18}\times\frac{18}{5}\text{ km/h}=80\text{ km/h}$$

52. (d) The correct match is 1-A, 2-C, 3-B, 4-D.
i.e. The SI unit of work is N-m or joule and it is denoted by W.

$1\text{ kW}=1000\text{ W}$
$1\text{ kWh}=3.6\times10^6\text{ J}$
$1\text{ HP}=746\text{ W}$

53. (c) From statements I and II,
Given, CI = ₹ 500
Amount (A) = ₹ 1500
∴ Principal (P) = 1500 − 500 = ₹ 1000

$$\left[\frac{A}{P}=\left(1+\frac{r}{100}\right)^3\right]$$

Then, $\frac{1500}{1000}=\left(1+\frac{r}{100}\right)^3$

$\Rightarrow\quad 1.5=\left(1+\frac{r}{100}\right)^3$

$\Rightarrow\quad 1+\frac{r}{100}=\sqrt[3]{1.5}$

$\therefore\quad r=(\sqrt[3]{1.5}-1)\times100\%$

Hence, both statements are sufficient to answer question.

54. (b) The value of acceleration due to gravity is 9.8 m/s^2. It is denoted by g which is known as the acceleration of freely falling bodies due to the force of attraction of the otherbody.

55. (b) ∵ Required average

$$=\frac{85+60+40+65}{4}=62.5$$

56. (a) Thorium element was the last element in Newland's law of octaves.
According to Newland's law of octave, if the chemical elements are arranged according to increasing atomic weight, those with similar physical and chemical properties occur after each interval of seven elements.

57. (a) On write ages of children in ascending order 2, 3, 5, 6, 7, 8, 9, 9
Here, n = 8 (even number)
Required median

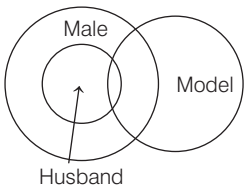
$$=\frac{\frac{n}{2}\text{th term}+\left(\frac{n}{2}+1\right)\text{th term}}{2}$$
$$=\frac{6+7}{2}=6.5$$

58. (c) The most ductile metal is gold (Au) one gram of gold may produce a wire with a length of around 2 kilometers. Metals may be shaped into various shapes depending on our demands due to their malleability and ductility.

59. (d) Carbon monoxide is not a constituent of biogas. Biogas is the mixture of different gases (e.g. H_2S,CH_4,CO_2 etc.) produced by the break down of organic matter in the absence of oxygen.

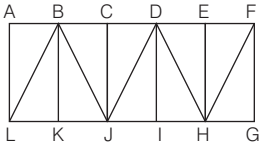
60. (c) Carpels present in the centre of a flower, forms the female reproductive part. It is made up of three parts; stigma, style and ovary. Ovary contains embryo sac (megaspore) in ovule.

61. (d) According to the question,



Hence, option (d) is correct answer.

62. (c)



Triangles are as follow,
ΔABL, ΔBCJ, ΔLBK, ΔBKJ, ΔLBJ, ΔBJD, ΔCDJ, ΔDHI, ΔJDI, ΔDIH, ΔDJH, ΔEFH, ΔFHG & ΔDHF
Hence, the total number of triangle = 14

63. (a) According to the question,
Z U D J K N C X W D T M M J F C T G K W Z U X R L
It is clear from the above that number of Vs will be zero.

64. (c) The forces between two bodies are always equal and opposite. This law is known as Newton's third law. These action-reaction forces acts on two different bodies. For example, when some one fires a gun, the action force pulls the bullets outside the gun and the reaction force pushes the gun backward.

65. (d) As per the given statements, the government should take steps to solve the power crisis. So that, these companies can't face the acute power shortage. While shutdown of the companies is not a solution of the problem. So, only I follows.

66. (c) $16-[5-2\{14\text{ of }2-(8\div4\times2-1+3\}]$
$=16-[5-2\{28-(2\times2-1+3\}]$
$=16-[5-2\{28-6\}]$
$=16-[5-44]=16+39=55$

67. (d) Simple expression : $\frac{(0.2)^3-(0.1)^3}{(0.2+0.1)^2}$

$$=\frac{(0.2-0.1)\{(0.2)^2+(0.2)+(0.1)+(0.1)^2\}}{(0.2+0.1)^2}$$
$$=\frac{(0.1)[0.04+0.02+0.01]}{(0.3)^2}$$
$$=\frac{(0.1)(0.07)}{(0.09)}=\frac{7}{90}$$

68. (b) $14\div\{(5\text{ of }2-3)\}\times4(7-2)$

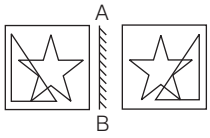
$$=\frac{14}{7}\times4\times5=2\times4\times5=40$$

69. (c) Given, radius of the earth = 40000 km
Work done, $W=F\cdot s\cos\theta$
Since, the direction of satellite is perpendicular to the satellite. The angle between the satellite and the gravitational force $\theta=90°$

$W=F\times40000\times\cos90°$
$\Rightarrow\quad W=F\times40000\times0\qquad(\because\cos90°=0)$
$\Rightarrow\quad W=0\text{ J}$

70. (d) If due to heavy rain in Bangalore, the normal lives of the citizens are paralysed, then government should take measures to help people and avoid life and property.
Hence, only I follows.

71. (d)



Hence, figure of option (d) is correct mirror image of given question figure.

72. (d) Answer figure (C) is correct folded image of given problem figure.
Hence, option (d) is correct answer.

73. (a) Let present age of Bipul = x yr
∴ Present age of Saibal = $(x+16)$ yr
According to the question,

$$x+16+12=1.5(x+12)$$
$\Rightarrow\quad x+28=1.5x+18$
$\Rightarrow\quad 0.5x=10$
$\therefore\quad x=\frac{10}{0.5}=20\text{ yr}$

Hence, present age of Saibal = $x+16$
$=20+16=36$ yr

74. (a) S. Sreesanth, ex cricketer has acted in the movies 'Team 5' and 'Aksar 2'. He was a right-arm fast-medium-pace bowler and a right-handed tail-ender batsman. In first-class cricket, he played for Kerala and in the Indian Premier League, he played for Rajasthan Royals.

75. (b) Given, height of object, h_o = 12 cm
Distance of object from the mirror, (v) = 60 cm
Focal length, (f) = 20 cm
Mirror formula, $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$

$\Rightarrow\quad \frac{1}{20}=\frac{1}{60}-\frac{1}{u}$
$\Rightarrow\quad \frac{1}{u}=\frac{1}{60}-\frac{1}{20}$
$\Rightarrow\quad u=30\text{ cm}$

Linear magnification, $m=\frac{v}{u}$
Height of image, $h_i=-2\times h_o$
$=-2\times12$
$=-2.4\text{ cm}$

SOLVED PAPER 2018

31st August (Shift II)

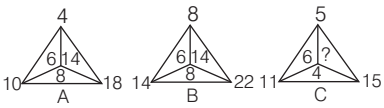
Railway Recruitment Boards (RRBs)

Assistant Loco Pilot (ALP) & Technician

DIRECTIONS

1. This question paper consists of 75 objective type questions, to be completed in 60 min.
2. This paper will consist questions related to Mathematics, Intelligence, General Science and General Awareness.

1. Assuming that the numbers in each of the following figures follow a similar pattern, select the option that can replace the question mark (?) in figure C.



(a) 14 (b) 10
(c) 6 (d) 8

2. ……. is the liquid part of the blood of which 92% is water and the remaining 8% is proteins, minerals, hormones, enzymes and so on.
(a) RBC (b) Plasma
(c) Blood platelet (d) WBC

3. Select the missing word based on the given related pair of words.
Butter : Milk : : Book : .....
(a) Printing (b) Chapter
(c) Author (d) Paper

4. If the frequency of a sound wave of given velocity is increased, how will it affect its wavelength?
(a) Its wavelength will increase.
(b) The wavelength will not be affected.
(c) Its wavelength will decrease.
(d) Wavelength will keep increasing and decreasing alternately.

5. When a number of resistance are connected in …… their combined resistance is less than the smallest individual resistance.
(a) parallel (b) horizontal
(c) series (d) box

6. Who launched 'Shramdaan movement' as part of Swachh Bharat and Swachh Puducherry initiative at Seliamedu village in Puducherry?
(a) Rajiv Bansal
(b) Prakash Javdekar
(c) Nitish Kumar
(d) Lt Governor Kiran Bedi

7. In the modern periodic table, elements present in the same period will have the same
(a) atomic weight
(b) number of shells
(c) atomic number
(d) valence electrons

8. When iron is exposed to moist air, a reddish brown coating of Hydrated iron (III) oxide (Fe_2O_3) is deposited on its surface. This reddish brown coating is called
(a) alloy (b) dust (c) rust (d) iron

9. Consider the given statement to be true and decide which of the courses of action logically follow(s) from the statement.
Statement
Teachers in India still teach using traditional methods and are not aware of modern methods of teaching.

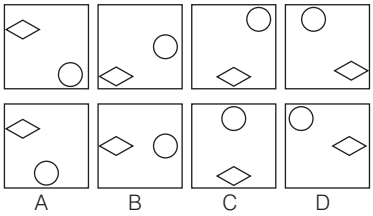
Courses of Action

I. Orientation should be done for teachers to change their method of teaching.

II. There should be a pay hike for teachers who teach in modern methods.

(a) Only II follows
(b) Both I and II follow
(c) Only I follows
(d) Neither I nor II follow

10. Select the figure that will come next in the following series.

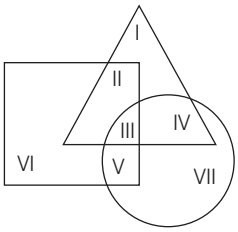


(a) C (b) B (c) D (d) A

11. Arzoo was born on 25th January, 2015, while Aastha was born 554 days later. On which date was Aastha born?

(a) 2nd August, 2016
(b) 31st July, 2016
(c) 1st August, 2016
(d) 3rd August, 2016

12.



In the given diagram, the triangle represents the set of people who possess a car, the square represents the set of people who possess a house; and the circle represents the set of people who possess gold. What is the total number of people who possess a house and gold but do not have a car?

(a) V (b) V+VI (c) V+III (d) V+VII

13. The sum of the lengths of the edges of a cube is equal to half the perimeter of a square. If the numerical value of the volume of the cube is equal to one-sixth of the numerical value of the area of the square, the length of one side of the square is

(a) 31.5 units (b) 36 units
(c) 27 units (d) 18 units

14. Pipe *A* can fill an empty cistern in 4 hours while along with Pipe *B* it can fill it up in 3 hours. Only Pipe *A* is turned on for an hour after which Pipe *B* is also turned on. How much total time will it take to fill up the cistern?

(a) 3 hours 20 minutes
(b) 3 hours 25 minutes
(c) 3 hours 15 minutes
(d) 3 hours

15. In the word ACCUMUATES, if the 1st letter is interchanged with the 2nd, 3rd letter with the 4th, 5th with the 6th, 7th with the 8th and 9th with the 10th, then the 6th letter from the left will be

(a) U (b) M (c) L (d) A

16. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement

The class teacher announced in the class that those who are going to the museum should deposit ₹ 200 by tomorrow 3 pm.

Assumptions

I. It is mandatory to go to the museum.

II. All students should deposit ₹ 200.

(a) Neither Assumption I nor II is implicit.
(b) Only Assumption II is implicit.
(c) Only Assumption I is implicit.
(d) Both Assumption I and II are implicit.

17. Name the only US President who also served as the Chief Justice of the US Supreme Court.

(a) John Quincy Adams
(b) William Howard Taft
(c) Lyndon B. Johnson
(d) Zachary Taylor

18. A right angled triangle *ABC* is right angled at *B* and $\tan A = \frac{4}{3}$.

If *AC* = 25 cm, the length of *BC* is

(a) 33.3 cm (b) 24 cm
(c) 20 cm (d) 18.75 cm

19. A train crosses a 550 m long platform in 36 sec. How long was the train if it was travelling at the speed of 70 km/h?

(a) 160 m (b) 140 m
(c) 150 m (d) 525 m

20. According to Ohm's Law, which of the following is true?

(a) The current flowing through a wire is directly proportional to the potential difference applied across it ends.
(b) The current flowing through a wire is directly proportional to its resistance.
(c) The current flowing through a wire is indirectly proportional to its length.
(d) The current flowing through the wire is indirectly proportional to the potential difference applied across it ends.

21.

Stu/Sub	P	C	B	M
W	70	90	50	85
X	55	80	95	60
Y	60	20	90	40
Z	90	80	40	65

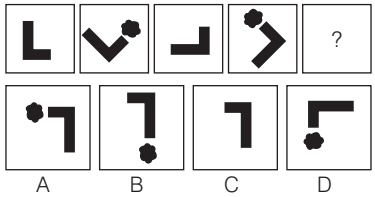
The given table represents the marks obtained by four students W, X, Y and Z in four subjects P, C, B and M, with the maximum marks in each subject being 100.
Based on the given data, W's marks percentage in P,C and B combined is

(a) 70 (b) 75
(c) 68 (d) 72

22. Which male cricketer has been appointed as the UNICEF and Cricket for Good ambassador for the ICC Women's Cricket World Cup 2017?

(a) Sachin Tendulkar
(b) Shane Warne
(c) Clive Lloyd
(d) Brian Lara

23. Select the option that will come next in the following figure series.



(a) C (b) B
(c) A (d) D

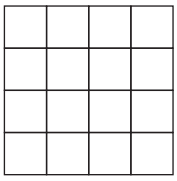
24. What percentage of 1 day is 18 minutes?

(a) 7.5% (b) 1.25%
(c) 12.5% (d) 1.8%

25. Which international tyre company has recently appointed ace badminton queen PV Sindhu as their brand ambassador?
(a) Pirelli (b) Michelin
(c) Continental (d) Bridgestone

26. The study of human evolution indicates that all of us belong to a single species that evolved in
(a) West Asia (b) Central Asia
(c) Africa (d) America

27. Select the option that represents the number of squares in the following figure.



(a) 30 (b) 64
(c) 16 (d) 32

28. In the series 5442673314884743581, the number of 4s that are completely divisible by the number on their right but not divisible by the number on their left is
(a) 3 (b) 1
(c) 0 (d) 2

29. Who was the first Indian to win the 52nd Capablanca Memorial Chess tournament at Cuba?
(a) Adhiban Baskaran
(b) Pentala Harikrishna
(c) K. Srikanth
(d) Krishnan Sasikiran

30. How many three digit whole numbers are there between 75 and 405?
(a) 305 (b) 307
(c) 304 (d) 306

31. Which Malayalam actress won the National Film Award for the Film 'Minnaminungu' in 2017?
(a) Amala Paul
(b) Surabhi Lakshmi
(c) Gopika
(d) Mamta Mohandas

32. Roshan Lal, who won the Guru Dronacharya Award for 2017, is associated with which stream of sport?
(a) Volleyball (b) Hockey
(c) Wrestling (d) Football

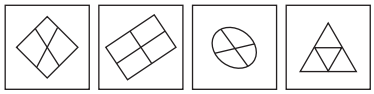
33. The radius of curvature of a concave mirror is 130 cm. Following Cartesian Sign Convention, its focal length is expressed as
(a) –30 cm (b) –15 cm
(c) +30 cm (d) +15 cm

34. When large quantities of ..... are consumed, it tends to show metabolic processes and to depress the central nervous system.
(a) butanol (b) propanol
(c) methanol (d) ethanol

35. If the momentum of a body is tripled, its KE will
(a) become three times its original value
(b) remain the same
(c) become six times its original value
(d) become nine times its original value

36. The Brownian Motion was discovered by
(a) Robert Brown
(b) Mandel Brown
(c) Isaac Newton
(d) John Brown

37. Select the figure that does not belong in the following group.



A B C D

(a) A (b) D
(c) B (d) C

38. Five angles of a hexagon measure 116° each. What is the measure of the remaining angle?
(a) 152° (b) 116° (c) 140° (d) 126°

39. An unbalanced chemical equation is called a
(a) rough chemical equation
(b) natural chemical equation
(c) complex chemical equation
(d) skeletal chemical equation

40. The total percentage of illiterates in all the four cities is ……(round to one decimal place).

City	Population	Literate	Illiterate	% of literate
A	200	150	50	–
B	–	200	100	66.6
C	150	50	100	–
D	120	–	90	25

(a) 44.5 (b) 44.3 (c) 44.2 (d) 44.1

41. The element with the highest electron affinity among halogens is
(a) F (b) I
(c) Cl (d) Br

42. There are 15 protons and 22 neutrons in the nucleus of an element. What is its mass number?
(a) 22 (b) 7
(c) 37 (d) 15

43. The selling price of an item inclusive of a 16% profit was ₹ 435. What would be the percentage loss if the item was sold for ₹ 330?
(a) 13 (b) 12
(c) 12.5 (d) 12.25

44. By selling a table for ₹ 16870, a shopkeeper suffers a loss of ₹ 1080. His loss percentage (rounded off to one decimal place) is
(a) 6.4% (b) 6.1% (c) 6.2% (d) 6.0%

45. Consider the given statement to be true and decide which of the conclusions logically follow(s) from the given statement.
Statements
All fruits are tree.
Some trees are birds.
Conclusions
I. Some birds are trees.
II. Some trees are fruits.
(a) Only Conclusion I follows
(b) Either Conclusion I or II follow
(c) Both Conclusions I and II follow
(d) Only Conclusion II follows

46. If $3x^2 + kx + k = 0$ has no solution, then the value of k will satisfy
(a) $k > -12$ (b) $k > 12$
(c) $k < 12$ (d) $0 < k < 12$

47. Which of the following is NOT an example of potential energy?
(a) Running water
(b) Water stored in a dam
(c) A raised hammer
(d) A compressed spring

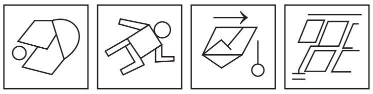
48. What is the difference between the place value and face value of 3 in 273965?
(a) 2997 (b) 2035
(c) 0 (d) 3962

49. Which of these two water bodies are connected by the Suez Canal?
(a) Mediterranean Sea and Black Sea
(b) Black Sea and Red Sea
(c) Mediterranean Sea and Red Sea
(d) Pacific Ocean and Atlantic Ocean

50. The given Problem Figure is embedded in one of the given Answer Figures. Which is that Answer Figure?

Problem Figure

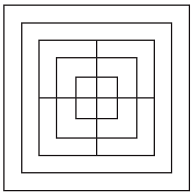
Answer Figures



A B C D

(a) D (b) C
(c) A (d) B

51. Select the option that represents the number of squares in the given figure.



(a) 13 (b) 15
(c) 14 (d) 17

52. A high jumper runs for a while before taking a high jump so that the inertia of .... helps him take the long jump.

(a) rest
(b) shape
(c) motion
(d) direction

53. Which of the following statements is/are incorrect?

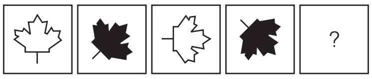
I. Bleaching powder is a pale yellow powder.
II. Dry NH_3gas turns red litmus blue.
III. The pH of rainwater is nearly 7.
IV. The pH of acid rain is nearly 5.6.

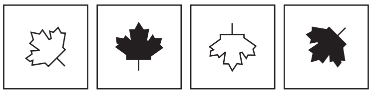
(a) I, II and IV
(b) I, II and III
(c) All of the above statements are correct
(d) Only II

54. The interest earned on ₹ 3675 at the rate of 4% simple interest per annum for 2 years will be

(a) ₹ 294
(b) ₹ 289.50
(c) ₹ 292
(d) ₹ 288.50

55. Select the option that will come next in the following figure series.





A B C D

(a) B (b) D
(c) A (d) C

56. A body has a weight W on the surface of Earth. What is its weight on a planet whose mass is 15 times that of Earth and a radius that is 4 times that of the Earth?

(a) $\frac{15}{4}W$ (b) $\frac{16}{9}W$
(c) $\frac{16}{7}W$ (d) $\frac{15}{16}W$

57. $0.296 + 2.96 + 29.6 + 296 = ?$

(a) 327.856 (b) 328.756
(c) 328.856 (d) 327.756

58. Which of the following numbers is divisible by 12?

(a) 73412 (b) 63412
(c) 83412 (d) 93412

59. What is the least number consisting of five digits that is exactly divisible by 12, 18, 20 and 25?

(a) 10800 (b) 11250
(c) 10000 (d) 10680

60. Who among the following is the Vice- Chairman of NITI Aayog?

(a) Narendra Modi
(b) Ajit Tyagi
(c) Rajiv Kumar
(d) Arvind Panagariya

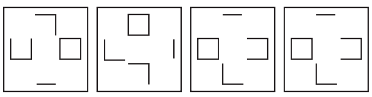
61. What is the process of production of ovum in the females called?

(a) Adolescence (b) Menarche
(c) Oogenesis (d) Menstruation

62. What is the square root of 5041?

(a) 79 (b) 81
(c) 71 (d) 69

63. Select the figure that does not belong in the following series.



A B C D

(a) C (b) D
(c) B (d) A

64. Consider the given statement to be true and decide which of the given courses of action logically follow(s) from the statement.

Statement

Many private schools in Bangalore charge more fees than the government-prescribed limits.

Courses of Action

I. Strict action should be taken against such schools.
II. Such schools should be shut down.

(a) Neither I nor II follow
(b) Only I follows
(c) Only II follows
(d) Both I and II follow

65. Which state organised India's first Tribal Entrepreneurship Summit in November 2017?

(a) Jharkhand
(b) Chhattisgarh
(c) West Bengal
(d) Odisha

66. If the second half of the given series is reversed, then what will be the fifth term to the left of the ninth term from the right?

9$YX8N6OLBUJZT@IQED%

(a) Q (b) O
(c) 6 (d) T

67. Pramod can paint a wall red in 12 hours while Brajen can whitewash the wall completely in 16 hours. If Pramod and Brajen work alternatively for an hour each starting when the wall has just cement on it till when it is completely painted red, how many hours will it take to paint the entire wall red?

(a) 89 (b) 96 (c) 48 (d) 95

68. Select the option that depicts the correct mirror image of the given word when the mirror is placed horizontally below the word.

POSITIVE

(a) ƎΛIꓕISOԀ (b) ԀOSIꓕIΛƎ
(c) ƎVITIƧOԀ (d) EVITISOP

69. Two pipes *X* and *Y* can individually fill a tank in 48 and 72 min, respectively. If they are opened simultaneously, how long will it take for the tank to fill?

(a) 39.4 min (b) 28.8 min
(c) 24 min (d) 60 min

70. Read the following question and decide which of the given statements is/are sufficient. Are women emotionally stronger than men.

Statements

I. Women think men' thinking cannot change any problem

II. Women are equal to men in all issues.

(a) Both I and II together are sufficient to answer the question.
(b) Neither I nor II is sufficient to answer the question.
(c) II alone is sufficient while I alone is not sufficient to answer the question.
(d) I alone is sufficient while II alone is not sufficient to answer the question.

71. Select the option that can replace the question mark (?) in the following equation.

$$\frac{(0.3)^3+(0.2)^3}{(0.3-0.2)^2}=?$$

(a) $\frac{5}{2}$ (b) 2 (c) $\frac{7}{2}$ (d) $\frac{3}{2}$

72. The length of one side of a rhombus is 17 cm and one of the diagonals was 16 cm. Find the length of the other diagonal.

(a) 30 cm (b) 16 cm
(c) 20 cm (d) 32 cm

73. A tendon is made up of

(a) inelastic connective tissue fibres
(b) inelastic and elastic connective tissue fibres
(c) only collagen fibres
(d) elastic connective tissue fibres

74. Select the missing term based on the given related pair of terms.

COULD : BNTKC : MOULD : .....

(a) CHMFI (b) LNKTC
(c) NITKH (d) LNTKC

75. Consider the given statement to be true and decide which of the following assumptions is/are implicit.

Statement

A leading school in Mumbai has increased its fees by 150% from the next academic year.

Assumptions

I. Students may change school due to more fees.

II. The school may still have the same demand among the students.

(a) Only Assumption I is implicit
(b) Either Assumption I nor II is implicit
(c) Only Assumption II is implicit
(d) Both Assumptions I and II are implicit

Answers

1	*(b)*	2	*(b)*	3	*(d)*	4	*(c)*	5	*(a)*	6	*(d)*	7	*(b)*	8	*(c)*	9	*(c)*	10	*(c)*
11	*(c)*	12	*(a)*	13	*(b)*	14	*(c)*	15	*(b)*	16	*(a)*	17	*(b)*	18	*(c)*	19	*(c)*	20	*(a)*
21	*(a)*	22	*(a)*	23	*(a)*	24	*(b)*	25	*(d)*	26	*(c)*	27	*(a)*	28	*(b)*	29	*(d)*	30	*(a)*
31	*(b)*	32	*(c)*	33	*(b)*	34	*(d)*	35	*(d)*	36	*(a)*	37	*(b)*	38	*(c)*	39	*(d)*	40	*(c)*
41	*(c)*	42	*(c)*	43	*(b)*	44	*(d)*	45	*(c)*	46	*(d)*	47	*(a)*	48	*(a)*	49	*(c)*	50	*(d)*
51	*(d)*	52	*(c)*	53	*(d)*	54	*(a)*	55	*(d)*	56	*(d)*	57	*(c)*	58	*(c)*	59	*(a)*	60	*(c)*
61	*(c)*	62	*(c)*	63	*(c)*	64	*(b)*	65	*(b)*	66	*(c)*	67	*(b)*	68	*(b)*	69	*(b)*	70	*(b)*
71	*(c)*	72	*(a)*	73	*(c)*	74	*(d)*	75	*(b)*										

Hints & Solutions

1. (b) The pattern followed here is
Figure A,

$10 - 4 = 6$
$18 - 4 = 14$
$18 - 10 = 8$

Figure B,

$14 - 8 = 6$
$22 - 8 = 14$
$22 - 14 = 8$

Similarly,
Figure C,

$11 - 5 = 6$
$15 - 11 = 4$
$15 - 5 = \boxed{10}$

2. (b) Plasma is the liquid part of the blood of which 92% is water and the remaining 8% is proteins, minerals, hormones, enzymes and so on.
Plasma in blood cells contains proteins like immunoglobulin, clotting factors and fibrinogen. Blood plasma helps in the transportation of glucose and other nutrients as well as nitrogenous waste materials to different parts of the body.

3. (d) As, butter is made from the milk. Similarly, a book consists of page and pages are made of paper.

4. (c) If the frequency of a sound wave of given velocity is increased, then the wavelength will decrease. Because frequency in inversely proportional to the wavelength

i.e. $\text{Frequency} = \frac{\text{Wave velocity}}{\text{Wavelength}}$

5. (a) When a number of resistance are connected in parallel, their combined resistance is less than the smallest individual resistance.
Let two resistances $R_1 = 2\Omega$ and $R_2 = 4\Omega$ are connected in parallel, then equivent resistance,

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$$

$$R_{eq} = \frac{4}{3} = 1.33\,\Omega$$

i.e. $1.33\,\Omega < 2\,\Omega$

6. (d) Lt Governor Kiran Bedi has launched 'Shramdaan movement' as part of Swachh Bharat and Swachh Puducherry initiative at Seliamedu village in Puducherry. Shramdaan is a habit and a movement in which everyone irrespective of status should be involved in the drive against garbage.
The slogan "Ek Tareekh Ek Ghanta Ek Saath" to clean our neighbourhood areas under the Swachhata Hi Seva campaign.

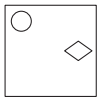
7. (b) In modern periodic table, elements present in the same period will have the same number of shells.
In the modern periodic table, elements are arranged in a series of rows. Elements of the same period have the same number of electron shells.

8. (c) When iron is exposed to moist air a reddish brown coating of hydrated iron (III) oxide (Fe_2O_3) is deposited on its surface.This reddish brown coating is called rust.

$$O_2 + Fe + H_2O \rightarrow \underset{\text{Rust}}{Fe_2O_3 \cdot H_2O}$$

9. (c) In order to make the teachers in India aware of modern methods of teaching. Orientation programs should be conducted to teach them the various method through which they can improve their teaching ability. Just paying more to the teachers who teach using modern methods cannot be the suitable course of action as the existing teachers are need to be brought up to the new standards.
Hence, only I course of action follows.

10. (c) In the given series, both the figures are moving with certain pattern in anti-clockwise direction.



Hence, Figure D is the correct answer.

11. (c) Let's count the number of months from 25th January
2015+(6 + 28 + 31 + 30 + 31 + 30 + 31+31 +30+31+30+31+31+29+31+30+31 +30+31+1) = 554
Hence, Aastha was born on 1st August 2016

12. (a) According to the given diagram, total number of people who possess a house and gold but do not have a car is represented by V.

13. (b) Let side of the square a units.
So, perimeter of the square = $4a$
Sum of the lengths of the edges of a cube
= 12 × Length of one edge of a cube
According to the question,
12× Length of one edge of a cube
$$= \frac{1}{2} \times 4a = 2a$$
Length of one edge of a cube
$$= \frac{2a}{12} = \frac{a}{6}$$
Given, volume of the cube = One-sixth of the area of the square
$$\Rightarrow \left(\frac{a}{6}\right)^3 = \frac{1}{6}a^2$$
$$\Rightarrow \frac{a^3}{216} = \frac{a^2}{6}$$
$$\Rightarrow a = 36 \text{ units}$$
Hence, the length of one side of the square is 36 units.

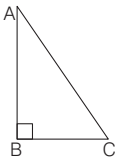
14. (c) Let the total work = 12 units
According to the question,
Efficiency of $A = \frac{12}{4} = 3$
Efficiency of $(A + B) = \frac{12}{3} = 4$
Efficiency of $B = 4 - 3 = 1$
Pipe A filled the cistern in 1h
$= 3 \times 1 = 3$ units
Remaining part = 12 − 3 = 9 units
Now, time taken by both pipes to fill the remaining cistern $= \frac{9}{4}$ h = 2 h + 15 min
Hence, time taken to fill the cistern
= 1 h + 2 h 15 min
= 3 h 15 min

15. (b) Given word, ACCUMUATES
After interchanging the letters in word, we get CAUCU[M]TASE
Hence, the 6th letter from the left will be M.

16. (a) **Assumption** I. 'It is mandatory to go to the museum' is not implicit in the given statement.
Assumption II 'All students should deposit ₹ 200' is not implicit in the given statement.
Hence, both the assumption are not implicit in the given statement.

17. (b) William Howard Taft is the only US President who also served as the Chief Justice of the US Supreme Court. He was the 27th President of the United States and the 10th Chief Justice of the United States. During his tenure, he oversaw the construction of the Panama Canal and served as provisional Governor of Cuba.

18. (c) Given, $\tan A = \frac{4}{3} = \frac{BC}{AB}$
and $AC = 25$ cm
Let $BC = 4x$ and $AB = 3x$



By Pythagoras theorem,
$$AC^2 = AB^2 + BC^2$$
$$\Rightarrow (25)^2 = (3x)^2 + (4x)^2$$
$$\Rightarrow 625 = 9x^2 + 16x^2$$
$$\Rightarrow 25x^2 = 625$$
$$\Rightarrow x^2 = 25$$
$$\Rightarrow x = 5$$
Hence, length of $BC = 4x = 4 \times 5 = 20$ cm

19. (c) Let length of the train = x m
Given speed of the train = 70 km/h
$$= 70 \times \frac{5}{18} \text{ m/s}$$
Length of the platform = 550 m
According to the question,
$$\frac{(550 + x) \times 18}{70 \times 5} = 36$$
$$\Rightarrow 550 + x = \frac{36 \times 70 \times 5}{18}$$
$$\Rightarrow 550 + x = 700$$
$$\Rightarrow x = 150 \text{ m}$$
Hence, the length of the train is 150 m.

20. (a) According to Ohm's law, if the physical state of a conductor (like temperature, voltage etc.) remains constants, then the current flowing through a wire is directly proportional to the potential difference applied across its end and inversely proportional to the resistance *i.e.*
$$I \propto \frac{V}{R}$$

21. (a) According to the question,
W's marks percentage in P,C and B,
combined $= \frac{(70 + 90 + 50)}{300} \times 100$
$= \frac{210}{300} \times 100 = 70\%$

22. (a) Sachin Tendulkar has been appointed as the UNICEF and Cricket for Good ambassador for the ICC Women's Cricket World Cup 2017.UNICEF and the ICC under the aegis of Cricket for Good aims to support in building a discourse around gender equality and the importance of empowering girls through sports.Sachin Tendulkar's engagement to promote the Women's World Cup would use innovative cricket-based messages to engage with girls and their families to encourage them to be a part of sports.

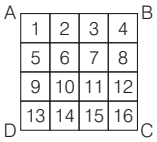
23. (a) The L-shaped figure is rotated in the 45° in the anti-clockwise direction and the star shape is attached with the alternate L- shaped figure.
Hence, Figure C will come next in the following figure series.

24. (b) 1 day = 24 × 60 min
$$\therefore \text{ Required percentage} = \frac{18}{24 \times 60} \times 100$$
$$= 1.25\%$$

25. (d) Bridgestone international tyre company has recently appointed ace badminton queen PV Sindhu as their brand ambassador. Sindhu's journey is an epitome of perseverance and determination and is a setting example to the youth to chose your Dream' which echoes with Bridgestone's global association with the Olympic Games.

26. (c) The study of human evolution indicates that all of us belong to a single species (*homo sapiens*) that evolved in Africa.
The scientific study of humans evolution is called Paleoanthropology. Current data suggest that modern humans evolved from archaic humans primarily in East Africa.

27. (a)



There are total 30 squares in the given figure
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16,
(1+2+5+6), (2+3+7+6), (3+4+8+7),
(5+6+10+9), (6+7+11+10), (7+8+12+11),
(9+10+14+13), (10+11+15+14),
(11+12+16+15),
(1+2+3+5+6+7+9+10+11),
(2+6+10+3+7+11+4+8+12),
(5+6+7+9+10+11+13+14+15),
(6+7+8+10+11+12+14+15+16), ABCD

28. (b) The number of 4s that are completely divisible by the number on their right but not divisible by number on their left is
[544] 2673314884743581
Hence, the correct answer is 1

29. (d) Indian Grandmaster Krishnan Sasikiran earned 6.5 points from 10 rounds to become the

first Indian to win the 52nd Capablanca Memorial Chess tournament at Varadero, Cuba.
He won the Indian Chess Championship for the first time in 1999 and won it repeatedly in 2002, 2003 and 2013. He won gold medal and bronze medal in Doha and Guangzhou, in the year 2006 and 2010 in mined team respectively.

30. (a) Between 100 to 200, there are 101 whole number.
Between 201 to 300, there are 100 whole number.
Between 301 to 400, there are 100 whole numbers.
Between 401 to 404, there are 4 whole numbers.
Hence, the total whole number between 75 and 405 = 101 + 100 + 100 + 4 = 305

31. (b) Malayalam actress Surabhi Lakshmi won the National Film Award for the film 'Minnaminungu' in 2017.
Surabhi's win is very significant because she is the first Malayalam actress to bag the award in this category after a gap of 14 years.

32. (c) Roshan Lal, who won the Guru Dronacharya Award for 2017, is associated with Wrestling. Government instituted the Dronacharya Award to recognise the efforts of coaches and trainers who dedicate their lives to enhancing the performance of athletes. The Dronacharya Award,officially known as Dronacharya Award for Outstanding Coaches in Sports and Games in sports coaching honour of the Republic of India.

33. (b) According to the question,
the radius of curvature (R) of a concave mirror is 30 cm. So, in Cartesian sign convention is –30 cm.

$$\text{Since, focal length } (f) = \frac{R}{2}$$
$$= -\frac{30}{2}$$
$$= -15 \text{ cm}$$

34. (d) When large quantities of ethanol are consumed, it tends slow metabolic processes and to depress the central nervous system. Ethanol or alcohol makes it harder for the brain areas controlling balance memory, speech and judgment to do their jobs.

35. (d) According to the question,
$\because$ Kinetic Energy (KE)

$$= \frac{\text{momentum } (p)^2}{2m}$$

If the momentum of the body is triple than kinetic energy

$$KE' = \frac{(3p)^2}{2m}$$
$$KE' = 9KE$$

Hence, if the momentum of a body is tripled, its KE will became nine times its original value.

36. (a) Brownian motion was discovered by Robert Brown.
Brownian motion refers to the random movement displayed by small particles that are suspended in fluids.

37. (b) Except figure D, in all other figures in the lines are intersecting.
Hence, figure D is the odd one out.

38. (c) Given, five angles of a hexagon measures 116°.
$\therefore$ Sum of internal each angle of any regular polygon = $(n-2)\times180°$
$\therefore$ Sum of internal angles in a hexagon ($n = 6$)
$= (6-2)\times180°$
$= 720°$
According to the question,
Five angles is $116°\times5 = 580°$
Remaining angle = $720°-580°$
$= 140°$
Hence, the measure of the remaining angle is 140°.

39. (d) An unbalanced chemical equation is called a skeletal chemical equation. In an unbalanced equation, there are unequal number of each type of atom on the reactant side compared with the product side.

40. (c) According to the question, total population in city B = 200 + 100 = 300
Total population in all the four cities
$= 200 + 300 + 150 + 120$
$= 770$
Total population of illiterates in all the four cities
$= 50 + 100 + 100 + 90 = 340$
Hence, the total percentage of illiterates in all the four cities $= \frac{340}{770}\times100 = 44.155\% \approx 44.2\%$

41. (c) The element with the highest electron affinity among halogens is chlorine. Chlorine the group 17th element has the highest electron affinity order Cl > F > Br > I

42. (c) There are 15 protons and 22 neutrons in the nucleus of an element. Its mass number is 37.
Mass number = Number of protons
+ Number of neutrons
$= 15 + 22 = 37$

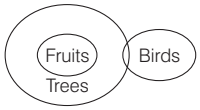
43. (b) According to the question,

$$\text{Cost price of an item} = 435\times\frac{100}{116} = ₹\,375$$
Loss = 375 – 330 = ₹ 45
$$\text{Hence, loss percentage} = \frac{45}{375}\times100 = 12\%$$

44. (d) According to the question,
Cost price of a table = 16870 + 1080
= ₹ 17950

$$\text{Hence, loss percentage} = \frac{1080}{17950}\times100$$
$$= 6.01\% \approx 6\%$$

45. (c) According to the given statement,



Conclusions
I. II.
Hence, both Conclusions I and II follow.

46. (d) Given, $3x^2 + kx + k = 0$ has no solution.
For the equation to have no solution,
$b^2 - 4ac < 0$
Here, $a = 3, b = k$ and $c = k$
Now $k^2 - 4\times3\times k < 0$
$\Rightarrow$ $k^2 - 12k < 0$
$\Rightarrow$ $k(k-12) < 0$
$\therefore$ $0 < k < 12$

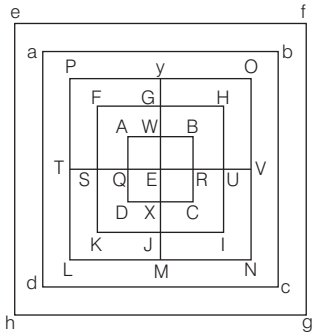
47. (a) Running water is the example of kinetic energy, not a potential energy. While water stored in a dam, a raised hammer and a compressed spring are the examples of potential energy. Because it is the energy that an object or body possesses due to its position or configuration.

48. (a) Place value of 3 in 273965 = 3000
and face value of 3 in 273965 = 3
Hence, required difference = 3000 – 3 = 2997

49. (c) The Suez Canal connects the Mediterranean Sea to the Red Sea through the Isthmus of Suez and divides Africa and Asia. The Suez Canal Authority officially opened the new side channel in 2016. This side channel, at the Northern side of the East extension of the Suez Canal, serves the East Terminal for berthing and unberthing vessels from the terminal.

50. (d) The given problem figure is embedded in the answer figure (B).

51. (d) Naming of the figure,



There are total 17 squares in the given figure
□AQEW, □ WERB, □QDXE, □EXCR, □ABCD, □FSEG, □GEUH, □SKJE, □EJIU, □FKIH, □PTEY, □YEVO, □DTLME, □EMNV, □PLNO, □abcd, □efgh

52. (c) A high jumper runs for a while before taking a high jump, in order to allow him to transition from inertia of rest to inertia of motion that will assist him in performing the long jump.

53. (d) Only (II) is incorrect.
Dry NH_3 gas not produce OH^- ion thats why red litmus does not convert in blue. Dry ammonia had no action on Litmus Paper.

54. (a) Given, principle (P) = ₹ 3675,
rate (R) = 4% and time (T) = 2 yr
According to the formula,

$$SI = \frac{P\times R\times T}{100}$$
$$= \frac{3675\times4\times2}{100}$$
$$= ₹\,294$$

55. (d) The leaf is rotating in clockwise direction by 45° in each step and alternate leaf is shaded.

Hence, figure (C) will come next in the given figure series.

56. (d) According to the question,

If mass of earth is M and mass of body is m, Radius of earth is r and the gravitational constant is G.

Then, weight $(w) = \frac{GMm}{r^2}$

On other planet, where mass is 15 M and the radius is $4r$.

Then, weight $(w') = \frac{G \times 15M \times m}{(4r)^2} = \frac{15}{16}\frac{GMm}{r^2}$

$$w' = \frac{15}{16}w$$

57. (c) $0.296 + 2.96 + 29.6 + 296 = ?$

$\Rightarrow$ $? = 328.856$

58. (c) The number which is completely divisible by 4 and 3 will be divisible by 12.

Divisibility rule of 4

If the last two-digit of number is divisible by 4, the number will be divisible by 4.

Divisibility rule by 3

If the sum of digits is divisible by 3, then the number will be divisible by 3.

As, from the options we can say that all the numbers are divisible by 4.

Checking the divisibility of 3 from options.

Option (a) 73412

$\Rightarrow$ $7 + 3 + 4 + 1 + 2 = 17$

17 is not divisible by 3.

Option (b) 63412

$\Rightarrow$ $6 + 3 + 4 + 1 + 2 = 16$

16 is not divisible by 3.

Option (c) 83412

$\Rightarrow$ $8 + 3 + 4 + 1 + 2 = 18$

18 is divisible by 3.

Option (d) 93412

$\Rightarrow$ $9 + 3 + 4 + 1 + 2 = 19$

19 is not divisible by 3.

Hence, 84312 is divisible by 12.

59. (a) LCM of 12, 18, 20 and 25 = 900

Smallest number of five digits = 10000

Now, when divide 10000 by 900. So, we get remainder = 100

$\therefore$ [10000 + (900 – 100)] = 10800 is the least 5-digit number.

60. (c) Rajiv Kumar is the Vice-Chairman of NITI Aayog replacing Arvind Panagariya. The NITI Aayog (National Institution for Transforming India) was established on 1st January, 2015 by the NDA Government. The main motto of this policy is to achieve sustainable development goals and to enhance cooperative federalism.

61. (c) Oogenesis is the process of production of ovum in females. It occurs in ovaries. During oogenesis, a diploid oogonium (egg mother cell) increases in size and gets transformed into a diploid primary oocyte, which divide by meiosis to form haploid ovum or secondary oocyte.

62. (c) Square root of 5041 $= \sqrt{5041} = 71$

63. (c) Except figure B, in all others figures contains same elements.

Hence, option (c) is the correct answer.

64. (b) If many private schools is Bangalore charge more fees than the government - prerscribed limits than strict action should be taken against such schools.

Hence, only course of action I follows.

65. (b) India's first Tribal Entrepreneurship Summit was held at Dantewada district of Chhattisgarh in November 2017. It was organised by NITI Aayog in partnership with the Government of the United States of America. The event is a part of 8th Global Entrepreneurship Summit being held in India. The summit was inaugurated by Minister of State for Science and Technology YS Chowdhary. The purpose of the summit is to inspire, nurture and promote the spirit of entrepreneurship in tribal youth.

66. (c) Given series, 9$YX8N60LBUJZT @ 1QF D%

After reversing the 2nd half of the given series

9$4X8N6 0LB%DFQ1@TZJU

Hence, the fifth term to the left of the ninth term from the right = 14th term from the right = 6

67. (b) According to the question,

Pramod can paint the wall $= \frac{1}{12}$ hour

Brajen can white wash the wall $= \frac{1}{16}$ hour

They work alternatively,

So, in the 1st hour the $\frac{1}{16}$ of the wall is painted white wash in the 2nd hour $\frac{1}{12}$ is painted red.

In 2 h, the wall painted red is

$$= \frac{1}{12} - \frac{1}{16} = \frac{1}{48}$$

So, in 2 h, $\frac{1}{48}$ of the wall is painted red,

$\therefore$ Entire wall painted red in $= \frac{48}{1} \times 2 = 96$

68. (b) Option (b) is the correct mirror image of the given question.

69. (b) Two pipes X and Y can individually fill a tank in 48 and 72 min, respectively.

Part of tank filled by X and Y together in 1 h

$$= \frac{1}{48} + \frac{1}{72}$$

$$= \frac{3+2}{144} = \frac{5}{144}$$

Hence, the time taken by both the pipe to fill the tank $= \frac{144}{5} = 28..8$ min

70. (b) First statement depicts the view point of women about men's thinking whereas second statement states the equality between men and women.

Hence, neither I nor II is sufficient to answer the question.

71. (c) $\frac{(0.3)^3 + (0.2)^3}{(0.3 - 0.2)^2} = ?$

$\Rightarrow$ $\frac{0.027 + 0.008}{(0.1)^2} = ?$

$\Rightarrow$ $\frac{0.035}{0.01} = ?$

$\Rightarrow$ $\frac{35}{10} = \frac{7}{2}$

72. (a) Given, side of the rhombus = 17 cm and $d_1 = 16$ cm

Let $d_2 = x$ cm

Since, diagonals of the rhombus bisect each other at right angle.

From Pythagoras theorem,

$$(\text{Side})^2 = \left(\frac{d_1}{2}\right)^2 + \left(\frac{d_2}{2}\right)^2$$

$\Rightarrow$ $(17)^2 = \left(\frac{16}{2}\right)^2 + \left(\frac{x}{2}\right)^2$

$\Rightarrow$ $289 = 64 + \frac{x^2}{4}$

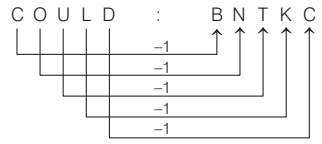
$\Rightarrow$ $\frac{x^2}{4} = 225$

$\Rightarrow$ $x^2 = 225 \times 4$

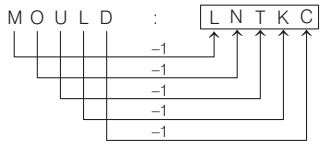
$\Rightarrow$ $r = 30$ cm

73. (c) Tendon is made up of only collagen fibres. Tendons are made up of dense fibrous connective tissue primarily composed of collagenous fibres. Collagen fibers are flexible strong and resistant to damage. Tendons attach muscles to the bones of skeleton.

74. (d) As



Similarly,



75. (b) Either Assumptions I or II follows because those who cannot afford to pay might leave the school and join another one or if the school manages to maintain its reputation even after fee increment, then it will still be in demand among students.

Hence, either Assumption I or II is implicit.