NARAYANA GROUP OF SCHOOLS

Max. Time : 120 Min **Max. Marks : 320**

Instructions:

i. The test paper consists of **80** multiple choice questions numbered from **1 to 80,** each question followed by four alternatives 1, 2, 3 and 4.

ii. Mental Ability 1 to 20, Mathematics 21 to 35, Physics 36 to 50 and Chemistry 51 to 65, Biology 66 to 80.

iii. Each question has only one correct option.

iv. (a) Each correct answer carries **+4 Marks**.
(b) For each wrong answer **1 mark** will be **deducted.**

MAT (Q.NO.1 TO 20)

Directions (Q.No : 1-2): The sets of numbers given in the alternatives are represented by two classed of alphabets as in the two given matrices. The columns and rows of Matrix I are numbered from 0 to 4 and those of Matrix II from 5 to 9. A letter from these matrices can be represented first by its row and then the column number e.g., in the matrices for questions 1 to 4, M can be represented by 14,21, etc. ; O can be represented by 20, 32, etc.

Matrix I

	0	1	2	3	4
0	F	O	M	S	R
1	S	R	F	O	M
2	O	M	S	R	F
3	R	F	O	M	S
4	M	S	R	F	O

Matrix II

	5	6	7	8	9
5	A	T	D	I	P
6	I	P	A	T	D
7	T	D	I	P	A
8	P	A	T	D	I
9	D	I	P	A	T

1. MOST

1) 40,44,22,89 2) 33,20,11,79 3) 21,00,03,88 4) 02, 13,34,56

2. ROAD

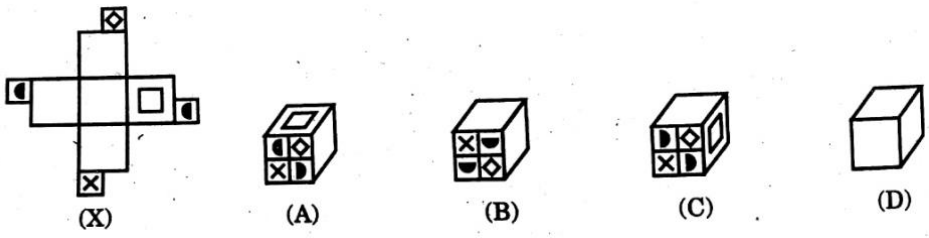
1) 42,32,79,58 2) 23,32,98,95 3) 11,13,67,69 4) 04,20,55,78

3. If 'train' is called 'bus', 'bus' is called 'tractor', 'tractor is called 'car', 'car' is

Called 'scooter', 'scooter' is called 'bicycle', is called 'moped', which is used to plough a field?

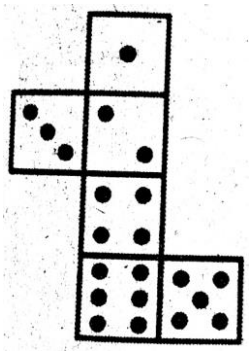
1) Train 2) Bus 3) Tractor 4) Car

4. Directions : The sheet of paper shown in the figure (X) Choose from amongst the alternatives the boxes that are similar to the box that will be formed.



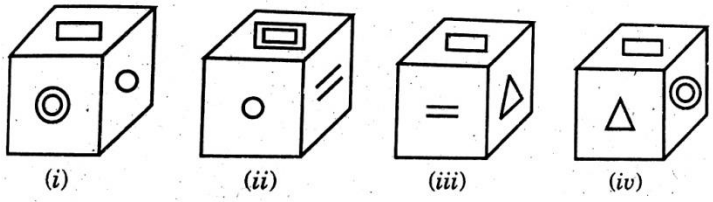
1) A, B and C only 2) B and C only 3) A, C and D only 4) B, C and D only

5. When the following figure is folded to forma cube, how many dots would lie opposite the face bearing five dots?

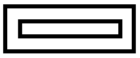


1) 1 2) 2 3) 3 4) 4

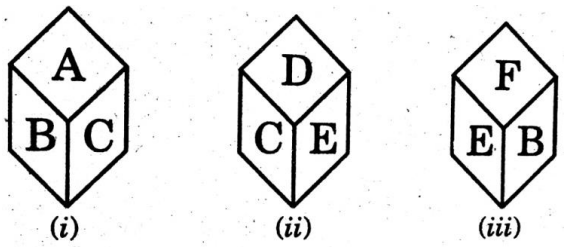
Directions (Q.No-6) : Below question based on the following illustrations, which are four views of a cube.



6. The symbol at the bottom of (iv) is

1)  2)  3)  4) 

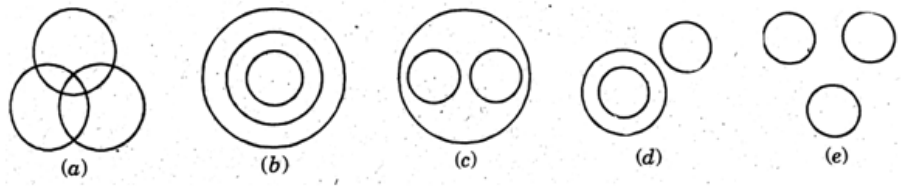
7. The six faces of a dice have been marked with alphabets A, B, C, D, E and F respectively. This dice is rolled down three times. The three positions are shown as:



Find the alphabet opposite A.

1) C 2) D 3) E 4) F

Directions (Q.No-8 to 11): Each of the following questions below contains three elements. These three elements may or not have some linkage. Each group of the elements may fit into one of the diagrams at (a), (b), (c), (d) and (e). You have to indicate groups of elements in each questions fit into which of the diagram given below. The letter indicating the diagram is the answer.



8. Iron, Lead, Nitrogen

1) a 2) e 3) c 4) d

9. Cabinet, Home Minister, Minister

1) a 2) b 3) c 4) e

10. Men, Rodents, Living beings

1) a 2) e 3) c 4) d

11. English, Latin, Greek

1) a 2) b 3) c 4) e

12. Find the next term in the alpha-numeric series Z1A, X2D, V6G, T21J, R88M, P445P,?

1) N2676S 2) N2676T 3) T2670N 4) T2676N

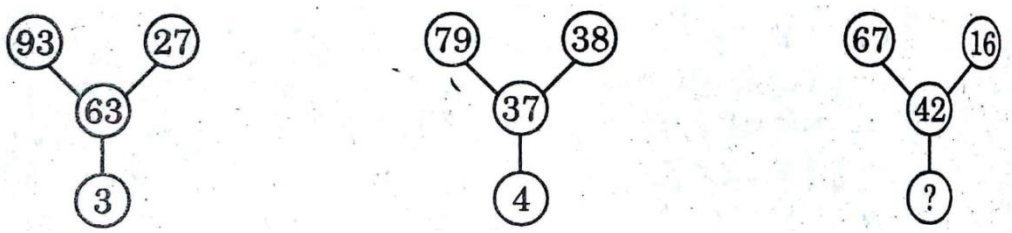
13. If the first and second digits in the sequence 5981327438 are interchanged, also the third and fourth digits, the fifth and sixth digits and so on, which digit would be the seventh counting to your left?

1) 1 2) 4 3) 7 4) 8

14. In a class, among the passed students, Amisha is twenty-second from the top and Sajal, who is 5 ranks below Amisha, is thirty-fourth from the bottom. All the students from the class have appeared for the exam. If the ratio of the students who passed in the exam to those who failed is 4 : 1 in that class, how many students are there in the class ?

1) 60 2) 75 3) 90 4) 95

15.



1) 5 2) 6 3) 8 4) 9

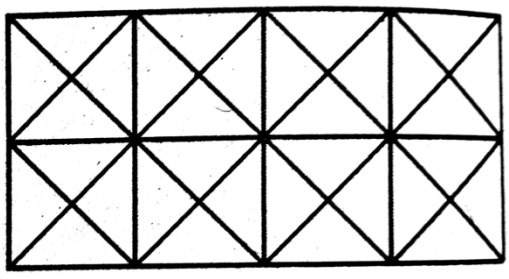
16. 'P-Q' means 'P is the mother of Q'; '$P \times Q$' means 'P is the father of Q' and '$P + Q$' means 'P is the daughter of Q'. Now if $M - N \times T + Z$, then which of the following is not true?

1) T is N's daughter 2) N is wife of Z

3) M is mother-in-law of Z 4) T is granddaughter of M

Directions (Q.No-17) : Count the number of squares in the following figures

17.



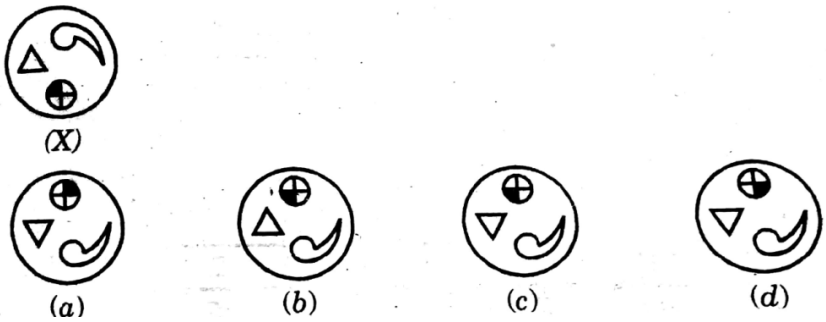
1) 11 2) 21 3) 24 4) 26

18. A clock seen through a mirror shows quarter to three. What is the correct time shown by the clock?

1) 9 : 45 2) 9 : 15 3) 8 : 45 4) 3 : 15

Directions (Q.No-19): Find out the water images

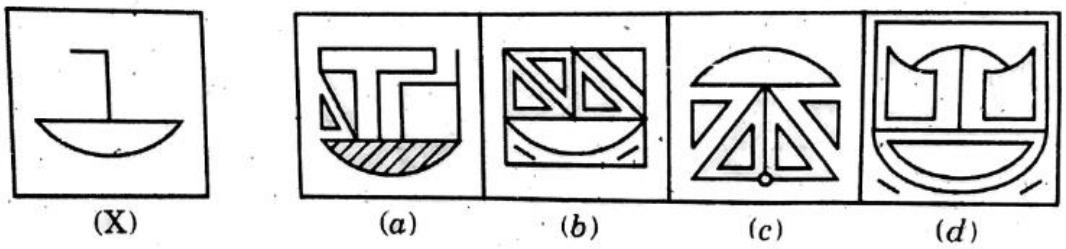
19.



1) a 2) b 3) c 4) d

Directions (Q. No: 20): Embedded Figure.

20.



1) a 2) b 3) c 4) d

MATHEMATICS (Q.NO.21 TO 35)

21. **If** $\sqrt{.04\times.4\times a}=.004\times.4\times\sqrt{b}$, **then** $\frac{a}{b}$ **is:**

1) 16×10^{-3} 2) 16×10^{-4} 3) 16×10^{-5} 4) None of these

22. **The largest four-digit number which is a perfect cube, is:**

1) 8000 2) 9261 3) 9999 4) None of these

23. **If** $x+y+z=0$, **then** x^2+xy+y^2 **equals:**

1) y^2+yz+z^2 2) y^2-yz+z^2 3) z^2-xy 4) z^2+zx+x^2

24. $\left\{\sqrt[4]{\left(\frac{1}{x}\right)^{-12}}\right\}^{-2/3}$ =_____

1) $\frac{1}{x^2}$ 2) $\frac{1}{x^4}$ 3) $\frac{1}{x^3}$ 4) $\frac{1}{x}$

25. $a^2-b^2-c^2+2bc+a+b-c$ **when factorized equals**

1) $(a-b-c)(a-b+c+1)$ 2) $(a+b-c)(a-b+c+1)$

3) $(a-b+c)(a-b+c+1)$ 4) $(a+b+c)(a-b+c+1)$

26. **The solution for** $\frac{2}{x+3}-\frac{4}{x-3}=\frac{-6}{x+3}$ **is:**

1) 9 2) -1 3) -3 4) 3

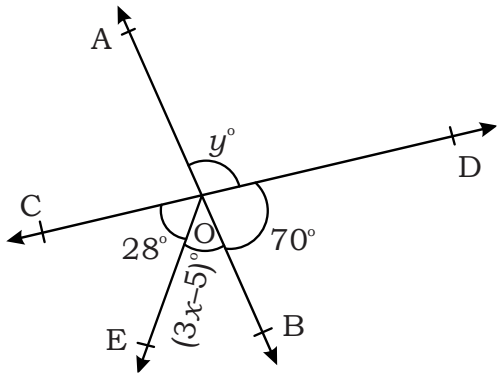
27. **The length of a rectangle is increased by 60%. By what percent would the width be decreased so as to maintain the same area?**

1) $37\frac{1}{2}\%$ 2) 60% 3) 75% 4) 120%

28. **The HCF of the polynomials** x^3-3x^2+x-3 **and** x^3-x^2-9x+9 **is:**

1) $x-3$ 2) $x-1$ 3) x^2+1 4) $(x-1)(x-3)$

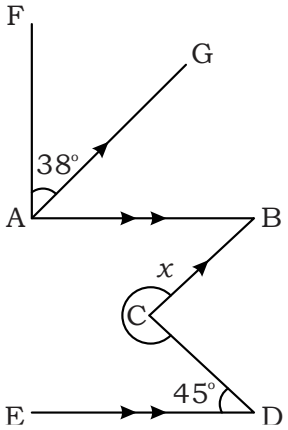
29. **In figure, if AOB and COD are straight lines, then**



1) $x=29, y=100$ 2) $x=110, y=29$

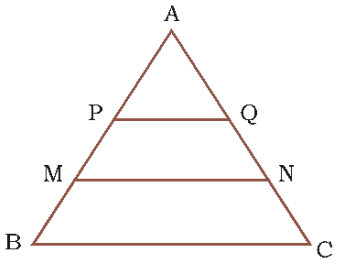
3) $x=29, y=110$ 4) $x=39, y=110$

30. **Given,** $AB \| ED, AG \| CB$ **and** $AF \perp AB$. $\angle FAG=38^\circ$, $\angle CDE=45^\circ$. **Find the value of *x*.**



1) 263° 2) 277° 3) 289° 4) 308°

31. In ΔABC, M & N are midpoints of AB and AC. P and Q are middle points of AM & AN and PQ = 1.6 cm then BC =



1) 6.2 cm 2) 6.4 cm 3) 6.6 cm 4) 5.4 cm

32. Sudhakar borrows Rs. 15000 from a bank to renovate his house. He barrows the money at 9% p.a. simple interest over 8 years. What are his monthly repayments?

1) Rs.265.75 2) Rs.268.75 3) Rs.262.75 4) Rs.264.75

33. If x + 1 men will do the work in x + 1 days, find the number of days that (x + 2) men can finish the same work?

1) (x + 2) days 2) $\frac{(x-1)^2}{x+2}$ days 3) (x + 1) days 4) $\frac{(x+1)^2}{x+2}$ days

34. ABCD is a quadrilateral in which $\angle A = 3x+20^0$, $\angle B = 5x+3^0$, $\angle C = 3x+10^0$, $\angle D = x+27^0$, then the value of x is

1) 25^0 2) 83^0 3) 43^0 4) 27^0

35. A number when divided by 296 leaves 75 as remainder. If the same number is divided by 37, the remainder obtained is

1) 2 2) 1 3) 11 4) 8

PHYSICS (Q.NO.36 TO 50)

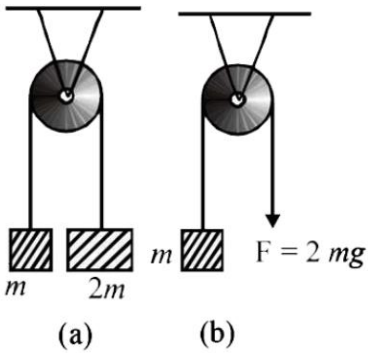
36. Mass m is divided into two parts xm and $(1-x)m$. For a given separation, the value of x for which the gravitational attraction between the two pieces becomes maximum is

1) $\frac{1}{2}$ 2) $\frac{3}{5}$ 3) 1 4) 2

37. Finger prints on a piece of paper may be detected by sprinkling fluorescent powder on the paper and then looking it into

1) Mercury light 2) sunlight 3) infrared light 4) ultraviolet light

38. The pulley arrangements shown in the figure are identical, the mass of the rope being negligible. In case (a) mass m is lifted by attaching a mass of 2m to the other end of the rope. In case (b) the mass m is lifted by pulling the other end of the rope with a constant downward force F = 2mg, where g is the acceleration due to gravity. The acceleration of mass m in case (a) is



1) Zero
2) More than that in case (b)
3) Less than that in case (b)
4) Equal to that in case (b)

39. Eardrum is a part of

1) Sound producing organ
2) Skeletal system
3) Hearing organ
4) Reproductive organ

40. What is the gap between the orbit of mars and Jupiter called?

1) Asteroids 2) Comets 3) Meteor 4) Meteorite

41. Identify the planet whose length of the days and tilt of its axis are almost identical to those of the earth

1) Uranus 2) Neptune 3) Saturn 4) Mars

42. The exact time taken by the earth to rotate one of its own axis is

1) 24 hours
2) 23 hours 51 minutes
3) 23 hours 48 minutes 46 seconds
4) 23 hours 56 minutes 4 seconds

43. A 60 kg man stands on a spring scale of a lift. At some instant he finds the scale reading has changed from 60 kg to 50 kg for a while and then comes back to the original mark. What should he conclude?

1) The lift was in uniform motion, upwards
2) The lift was in uniform motion, downwards
3) The lift while in accelerated motion upwards suddenly stopped
4) The lift while in accelerated motion downward suddenly stopped

44. A concave mirror of focal length 100cm is used to obtain the image of the sun which subtends an angle of 30^0. The diameter of the image of the sun will be

1) 1.74cm 2) 0.87cm 3) 0.435cm 4) 100cm

45. An object will continue moving uniformly until

1) The resultant force acting on it begins to decrease
2) The resultant force on it is zero
3) The resultant force is at right angle to its rotation
4) The resultant force on it is increased continuously

46. An object will continue to accelerate until

1) The resultant force begins to decrease
2) The resultant force on it is zero
3) The velocity changes direction.
4) The resultant force on it is increased continuously

47. Which has the greater momentum, a heavy truck at rest or a moving roller skate?

1) Cannot tell from the information given.
2) The heavy truck.
3) The roller skate
4) They are equal

48. Astronauts in space can't stand at one place, because

1) There is no gravity
2) Viscous forces of the atmosphere are very strong
3) Solar wind exert an upward force
4) Atmospheric pressure is very low

49. Name the world's first artificial Satellite?

1) Sputnik 1 2) INSAT-1B 3) Explorer 1 4) Aryabhata

50. If the mass of Earth were suddenly and magically reduced to half its present value, the magnitude of Earth's acceleration about the Sun would

1) Reduce by a factor of 4 2) reduce by a factor of 2
3) Remain the same 4) increase by a factor of 2

CHEMISTRY (Q.NO.51 TO 65)

51. **If 20g of rock salt is present in 100gr of solution then mass percentage of water is ___**

1) 20 2) 100 3) 80 4) 25

52. In solution the amount of solute present in more the solution is said to be ____

1) Diluted solution 2) Concentrated solution
3) Saturated solution 4) Unsaturated solution

53. The molecular formula of Magnetite is

1) $CaCO_3$ 2) KNO_3 3) $BaSO_4$ 4) Fe_3O_4

54. The Property by Virtue of which substance can be drawn into wires is called as

1) Malleability 2) Ductility 3) Conductivity 4) Lustier

55. _____is not attacked by water and alkalies.

1) Zn 2) Hg 3) Ca 4) Al

56. The density of water is maximum at

1) 0^0C 2) 100^0C 3) 277K 4) 373K

57. Brass is an alloy of

1) Iron and zinc 2) Copper and zinc

3) Iron and chromium 4) Copper and Iron

58. If 8g of ammonium chloride is present in 50gr of solution, then mass percentage of ammonium chloride & water _____

1) 8,50 2) 16,100 3) 8,92 4)16,84

59. Butter from curd is separated by

1) Distillation 2) Sublimation 3) Centrifugation 4) Filtration

60. Like fuel the sun also provides heat and light. The process taking place in the sun is called

1) Combustion 2) Nuclear process 3) Burning 4) All of these

61. Mass by Volume percentage of a solution= _____

1) $\frac{Mass\ of\ solution}{Volume\ of\ solute}\times 100$ 2) $\frac{Mass\ of\ solvent}{Volume\ of\ solution}\times 100$

3) $\frac{Mass\ of\ solute}{Volume\ of\ solution}\times 100$ 4) $\frac{Mass\ of\ solute}{Mass\ of\ solution}\times 100$

62. The coal obtained from the fire wood is usually_____

1) Coke 2) Charcoal 3) Coal tar 4) All

63. Naphthalene balls are obtained from coal tar and are used as

1) Mosquito repellent 2) Honey bee repellent 3) Moth repellent 4) Snake repellent

64. In India where the gas fields, were discovered_____

1) Tripura 2) Godavari Delta 3) Krishna 4) All

65. Good fuels have

1) Low ignition temperature and high calorific value.

2) Low ignition temperature and low calorific value.

3) High ignition temperature and high calorific value.

4) High ignition temperature and low calorific value.

BIOLOGY (Q.NO.66 TO 80)

66. Identify the mismatch among the following statements:

1) The flexibility in plants is due to the tissue - Collenchyma

2) A tissue which divides and re-divides - Meristematic tissues

3) Cartilage and bone are types of - Protective tissue

4) The size of the stem increases in the width due to-Cambium tissue

67. Which are the four types of animal tissues?

1) Epithelial, Squamous, Muscular, Connective

2) Epithelial, connective, Muscular, Cardiac

3) Connective, Muscular, Epithelial, Nervous

4) Cuboidal, Ciliated, Glandular, Columnar

68. Read the following definitions and identify the wrong definition

1) When a living cell loses water, there is shrinkage of contents of a cell away from the cell wall. This phenomenon is called as plasmolysis.

2) The cell engulfs food is called endocytosis and ejects solid is called exocytosis

3) The cell loses water, if the medium has lower water concentration (Hypertonic solution) than the cell.

4) Osmosis is the passage of water from the region of low water concentration to a region of high water concentration through a selective permeable membrane.

69. The nitrogen molecules present in air can be converted into nitrates and nitrites by

1) a biological process of nitrogen fixing bacteria present in soil

2) a biological process of carbon fixing factor present in soil

3) Any of the industries manufacturing nitrogenous compounds

4) The plants used as cereal crops in field

70. One of the following processes is not a step involved in the water-cycle operating in nature

1) Evaporation 2) Transpiration 3) precipitation 4) photosynthesis

71. The term "water-pollution" can be defined in several ways. Which of the following statements does not give the correct definition?

1) The addition of undesirable substances to water-bodies

2) The removal of desirable substances from water-bodies

3) **A change in pressure of the water bodies**

4) A change in temperature of the water bodies.

72. Plasmodium is found in

1) all mosquitoes 2) female anopheles 3) Aedes mosquito 4)white mosquito

73. Diarrhea, vomiting and sever abdominal cramps shows their sign in

1) Food poisoning 2) constipation 3) heart diseases 4) muscle cramps

74. Which of the following reproduces only inside a host cell?

1) Bacteria 2) Virus 3) Amoeba 4) Fungus.

75. Classify the following into friendly microorganisms Yeast, malarial parasite, Lactobacillus, bread mould, Rhizobium, Bacillus anthracis

1) Malarial parasite, Lactobacillus, bread mould, Rhizobium

2) Bacillus anthracis, Yeast, Lactobacillus, Rhizobium

3) Bread mould, Yeast, Lactobacillus, Rhizobium

4) Malarial parasite Yeast, Lactobacillus, Rhizobium

76. Which of the following shows budding?

1) Hydra 2) Paramecium 3) Amoeba 4) Spirogyra

77. Where does fertilisation take place in humans?

1) Vagina 2) Fallopian Tube 3) Cervix 4) Uterus

78. The process of release of an egg from the ovary is called.

1) Reproduction 2) menstruation 3) ovulation 4) menopause

79. Which of the following is a viviparous animal:

1) Bat 2) Cow 3) Monkey 4) All of these

80. Part of earth which supports the biodiversity is called

1) Biosphere 2) Sanctuary 3) Ecosystem reserve 4) Biotic community

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