

VISTO-2015 - 16

(VELAMMAL INTER SCHOOL SCIENCE TALENT OLYMPIAD)

SEASON – II

CLASS - VI

Duration: 2hrs.

Max. Marks: 100

INSTRUCTIONS TO THE CANDIDATE

- Write your **NAME** and **CLASS** in the space provided on **OMR** Response sheet.
 - You have to mark the answers on the **OMR** Response sheet only.
 - You have to handle the **OMR** Response sheet with utmost care.
 - Do not fold/mutilate or make any unnecessary markings on the **OMR** Response sheet.
 - Use **BLUE** or **BLACK BALL POINT PEN** only to darken the appropriate circles in **OMR** Response sheet.
- Answers marked with **PENCIL** will not be considered for evaluation.
- This Question Paper consists of **100 QUESTIONS**, under four subject heads, **MATHEMATICS (40 Questions)**, **PHYSICS (20 Questions)**, **CHEMISTRY (20 Questions)** and **BIOLOGY (20 Questions)**.
- Each question has four alternative responses marked a, b, c, d. You have to darken the appropriate circle provided in the OMR Response sheet against each question.
- 1 MARK** will be awarded for every correct response for all the questions in **ALL THE FOUR SUBJECTS**.
- NO** mark will be deducted for incorrect response.
- Usage of Calculators, Log tables and Electronic gadgets is strictly prohibited in the examination hall.
- Return the OMR Response sheet to the Invigilator at the end of Examination, before leaving the examination hall.

***** All the best *****

MATHEMATICS

1. The number of positive integers between -5 and 0 is
a) 5 b) 0 c) 10 d) 7
2. Identify the correct descending order of 0, 7, -3, -9, -132, 36 among the following:
a) 36, 7, 0, -3, -9, -132 b) 36, 7, 0, -132, -9, -3
c) -3, -9, -132, 0, 7, 36 d) -132, -9, -3, 0, 7, 36
3. The smallest among the fractions $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{12}$ and $\frac{2}{3}$ is
a) $\frac{2}{3}$ b) $\frac{7}{12}$ c) $\frac{5}{6}$ d) $\frac{3}{4}$
4. Three cans contain 23.261ml, 60.5ml and 71.486ml of kerosene respectively. What should be the minimum capacity of a can that can hold the total quantity of kerosene?
a) 160l b) 155l c) 150l d) 170l
5. The total cost of flooring a room at Rs.8.50 per sq. meter is Rs.510. If the length of the room is 8m then the breadth is
a) 5.7m b) 7.5m c) 6.7m d) 7.6m
6. If $\frac{2}{3}p - 2\frac{1}{2} = 3\frac{1}{2}$ then p =
a) -9 b) 6 c) 9 d) 0
7. A fraction is equivalent to $\frac{5}{8}$. Its denominator and numerator add up to 91. What is the difference between the denominator and numerator of this fraction?
a) 21 b) 33 c) 13 d) 19
8. The length of a rectangle is 4 times as long as its breadth. If the length is 8cm shorter and breadth is 4cm longer, a square will be formed, then the area of the rectangle is
a) 16cm² b) 32cm² c) 64cm² d) 80cm²
9. The ratio of 250ml to 2 litres is
a) 250 : 2 b) 250 : 200 c) 1 : 8 d) 125 : 1
10. The ratio of two numbers is 3 : 4 and their H.C.F is 4 then their LCM is
a) 12 b) 16 c) 24 d) 48
11. Among the following the correct sequence in increasing order is
a) $\frac{223}{71}, \pi, \frac{22}{7}$ b) $\pi, \frac{223}{71}, \frac{22}{7}$ c) $\frac{22}{7}, \pi, \frac{223}{71}$ d) $\frac{223}{71}, \frac{22}{7}, \pi$
12. Sumeet purchased a book costing Rs.24.75 and a pencil box. He got back Rs.32.75 when he gave a Rs.100 note. The cost of the pencil box is
a) Rs.24.75 b) Rs.42.75 c) Rs.42.50 d) Rs.45.20
13. If Rs.66666 is divided in the ratio 1 : 2 then the smaller amount is
a) Rs.11111 b) Rs.22222 c) Rs.33333 d) Rs. 44444
14. If 9, x, x, 49 are in proportion then x =
a) 7 b) 14 c) 21 d) 35

22. **Statement A:** The algebraic expression for the statement “6 less than the quotient of x and 3 equals 2” is $\frac{3}{x} - 6 = 2$

Statement B: The solution of $x - \frac{3}{2} = 1\frac{1}{2}$ is $\frac{3}{2}$

- a) Both A and B are true
- b) A is true and B is false
- c) A is false and B is true
- d) Both A and B are false

23. **Statement A:** If $24ab - 10b - 18a$ subtracted from $30ab + 12b + 14a$ then the result is $6ab + 22b + 32a$

Statement B: The value of the expression $n^3 + 5n^2 + 5n - 2$; when $n = -2$ is 0.

- a) Both A and B are true
- b) A is true and B is false
- c) A is false and B is true
- d) Both A and B are false

24. **Statement A:** The cost of fencing a rectangular park of length 250m and breadth 175m at the rate of Rs.12 per metre is Rs.12,000

Statement B: The perimeter of a regular pentagon with each side measuring 3cm is 15cm

- a) Both A and B are true
- b) A is true and B is false
- c) A is false and B is true
- d) Both A and B are false

25. **Statement A:** The ratios 15cm to 2m and 10sec to 3 minutes form a proportion

Statement B: If the cost of 6 cans of juice is Rs.210 then the cost of 4 cans of juice is Rs.140

- a) Both A and B are true
- b) A is true and B is false
- c) A is false and B is true
- d) Both A and B are false

Read the following paragraph and answer the questions from 26 to 30:

There are 1800 students in a school. 800 choose football, 750 choose basket ball and the remaining did not choose any of the games. A student can choose only one game.

26. The ratio of the number of students who chose atleast one game to the total number of students in the school is

- a) 750 : 1800
- b) 36 : 31
- c) 31 : 36
- d) 800 : 1800

27. The ratio of the number of students who chose basket ball to the number of students who chose foot ball is

- a) 5 : 16
- b) 16 : 15
- c) 16 : 3
- d) 15 : 16

28. The ratio of number of students who choose foot ball and who did not choose any game is ...

- a) 16 : 5
- b) 16 : 20
- c) 16 : 15
- d) 800 : 250

29. The ratio of total number of students to the number of students who choose basket ball is ...

- a) 1 : 5
- b) 12 : 5
- c) 5 : 12
- d) 12 : 1

30. Which of the following ratios represents the ratio of number of students who chose basket ball to the number of students who chose atleast one game?

- a) 15 : 51
- b) 31 : 15
- c) 15 : 31
- d) 13 : 15

Read the following paragraph and answer the questions from 31 to 32:

The weights of Raj and Suraj are 69.725kg and 69.45kg respectively.

31. What is their total weight in kg?

- a) 193.715
- b) 139.715
- c) 139.175
- d) 139.751

32. By how many kg does Raj weigh more than that of Suraj ?

- a) 0.752
- b) 0.725
- c) 0.527
- d) 0.275

Read the following paragraph and answer the questions from 33 to 36:

On a certain day, the temperatures recorded in a few cities are given in the table:

33. In which city was the temperature maximum?

- a) Darjeeling b) Ooty
c) Kashmir d) Hyderabad

| Place | Temperature |
|------------|-------------|
| Hyderabad | 35°C |
| Ooty | 17°C |
| Kashmir | -2°C |
| Darjeeling | -5°C |
| Shimla | -4°C |

34. In which city was the temperature least?

- a) Ooty b) Darjeeling
c) Shimla d) Kashmir

35. What is the difference of temperatures in Ooty and Shimla?

- a) 21°C b) 13°C c) -13°C d) -21°C

36. Which of the following gives the correct order of the cities in the increasing order of their temperatures?

- a) Ooty, Hyderabad, Darjeeling, Kashmir b) Ooty, Hyderabad, Kashmir, Darjeeling
c) Darjeeling, Kashmir, Ooty, Hyderabad d) Ooty, Hyderabad, Kashmir, Shimla

37. **Assertion (A):** The value of x in $12 : 3 :: x : 1$ is 4.

Reason (R): If $a : b = c : d$ then a, b, c, d are said to be in proportion and $ad = bc$

- a) Both A and R are true and R is correct explanation of A
b) Both A and R are true and R is not correct explanation of A.
c) A is true and R is false d) A is false and R is true

38. **Assertion (A):** The area of a rectangle is 630 sqcm and its breadth is 15cm then its length is 55cm

Reason (R): The area of a rectangle is given by $A = \text{length} \times \text{breadth}$

- a) Both A and R are true and R is correct explanation of A
b) Both A and R are true and R is not correct explanation of A.
c) A is true and R is false d) A is false and R is true.

39. If x and y vary directly and k is a constant then

- a) $xy = k$ b) $\frac{x}{y} = k$ c) $x + y = k$ d) None

40. The predecessor of 80808080 is.....

- a) 80808 99 b) 80808081 c) 80808080 d) 80808079

PHYSICS

41. The direction of conventional current in a circuit is from

- a) Negative terminal to positive terminal of a cell, outside the cell
b) Positive terminal to negative terminal of a cell, outside the cell
c) Negative terminal to positive terminal of a cell, inside of the cell
d) Both b and c

42. emf of a cell is a

- a) Force b) Work c) Current d) None

43. A good conductor of electricity has,

- a) More number of free electrons b) Zero number of free electrons
c) More number of free protons d) more number of free neutrons

44. In a conductor 4C of charge flows for 2 second then the value of electric current will be

- a) 4V b) 4A c) 2A d) 2V

54. When the length and area of cross – section both are doubled then the resistance of the wire will
- a) become half
 - b) be doubled
 - c) become four times
 - d) remain the same
55. **Assertion (A):** Diamagnetic materials can exhibit magnetism
Reason (R): Diamagnetic materials have permanent magnetic dipole moment
- a) Both A and R are true and R is correct explanation of A
 - b) Both A and R are true and R is not correct explanation of A.
 - c) A is true and R is false
 - d) A is false and R is true
56. A permanent magnet
- a) Attracts all substances
 - b) Attracts only magnetic substances
 - c) Repels magnetic substances
 - d) All the above
57. Current is a
- a) Vector
 - b) Tensor
 - c) Scalar
 - d) All
58. An example of a diamagnetic substance is
- a) Nickel
 - b) Cobalt
 - c) Iron
 - d) Copper
59. Device used to measure the amount of current
- a) Ammeter
 - b) Voltmeter
 - c) Electroscope
 - d) Potentiometer
60. When an electrical appliance is switched on, it responds almost immediately, because
- a) The electrons in the connecting wires move with the speed of light
 - b) The electrical signal is carried by electromagnetic waves moving with the speed of light
 - c) The electrons move with speed which is close to, but less than speed of light
 - d) The electrons are stagnant

CHEMISTRY

61. Generally the percentage of water in a human body is
- a) 90%
 - b) 50%
 - c) 70%
 - d) 80%
62. The process of collecting rain water in huge pits is called:
- a) Storing of water
 - b) Conservation of water
 - c) Rainwater harvesting
 - d) Transportation of water
63. Water can exist in all the three states at a temperature of
- a) 0°C
 - b) 100°C
 - c) 25°C (Room temperature)
 - d) At all temperatures
64. A substance used for removal of harmful bacteria in water is
- a) Lime
 - b) Potassium dichromate
 - c) Chlorine
 - d) All the above
65. The alternate evaporation and condensation of water builds a natural balance. It is called
- a) Condensation cycle
 - b) Water cycle
 - c) Evaporation cycle
 - d) All
66. The atmosphere extends to an altitude of
- a) 200km
 - b) 500km
 - c) 320km
 - d) 600km
67. Which of the following will result in a chemical change?
- a) Mixing of milk and sugar
 - b) Mixing of milk and curd
 - c) Mixing of milk and water
 - d) Mixing of water and salad

68. Which of the following change is wrongly identified?
- a) Eating of dosa in breakfast – Chemical change
 b) Cutting of wood to make furniture - Chemical change
 c) Making fruit custard from milk – Chemical change
 d) Baking a cake - Chemical change
69. The ratio of oxygen and nitrogen in the atmosphere respectively is
 a) 2 : 4 b) 4 : 2 c) 4 : 1 d) 1 : 4
70. Aquatic animals and plants:
 a) Breath through the water b) Have to come out of water to breathe
 c) Use the oxygen dissolved in water to breathe d) Do not breathe at all
71. The gas used in filling weather balloons is
 a) Oxygen b) Helium c) Nitrogen d) Water vapour
72. One fifth part of air is
 a) Nitrogen b) Hydrogen c) Helium d) Oxygen
73. Which gas is released during respiration?
 a) NO c) CO c) CO₂ d) SO₂
74. Which of the following are transparent materials?
 a) Glycerine b) Water c) Milk d) Both 'a' and 'b'
75. Select the one that is different from others
 a) PVC pipe b) GI pipe c) Plastic basket d) Plastic toy
76. Generally metals are shining but some of them lose their shine and appear dull when exposed to the atmosphere. It is due to the
 a) action of air on their surface b) action of water
 c) Both (a) and (b) are correct d) Neither (a) nor (b) are correct
77. NO₂ in air can cause
 a) Respiratory problem b) Acid rain
 c) Better living conditions d) All the above
78. Which of the following are not green house gases
 a) CO₂ and CH₄ b) Ozone and water vapour
 c) Methane and water vapour d) NH₃ and CO
79. Liquid oxygen is in colour.
 a) Yellow b) Pale green c) Pale blue d) Brown
80. The formula of rust is
 a) Fe₂O₃ b) Fe₂O₃.xH₂O c) FeO.2H₂O d) Fe₃O₄

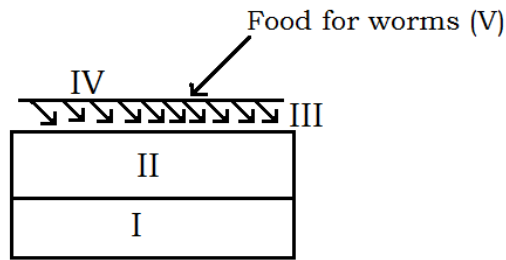
BIOLOGY

81. In some cities, municipalities provide separate dust bins for collecting two kinds of garbage. Usually one is coloured green and the other blue. How do you segregate the waste given below into two bins? Which one can be used as the compost?

Husk(1), Tea leaves (2) , broken glass (3), Vegetable peels(4), Old Shoes(5), Nails (6)

| | Green Bin | Blue bin | Compost |
|----|------------------|-----------------|----------------|
| a) | 1, 2, 4, 6 | 3, 5 | Green bin |
| b) | 1, 3, 4, 5 | 2, 6 | Blue bin |
| c) | 1, 2, 4 | 3, 5, 6 | Blue bin |
| d) | 1, 2, 4 | 3, 5, 6 | Green bin |

82. The following diagram represents the setup for vermi composting



I, II, III, IV and V in the above set up are

| | I | II | III | IV | V |
|---|---------------------|--------------------|----------------|---------------------|--------------------|
| a | Sand (1-2 cm thick) | Chicken mesh | Sprinkle water | Earth worms | Pickles, oil |
| b | Chicken mesh | Sand (1-2cm thick) | Sprinkle water | Earth worms | Vegetable waste |
| c | Chicken mesh | Vegetable waste | Sprinkle water | Earth worms | Coffee/tea remains |
| d | Chicken mesh | Earth worms | Sprinkle water | Sand (1-2 cm thick) | Coffee/tea remains |

83. Which among the following is **correct** regarding earthworms?

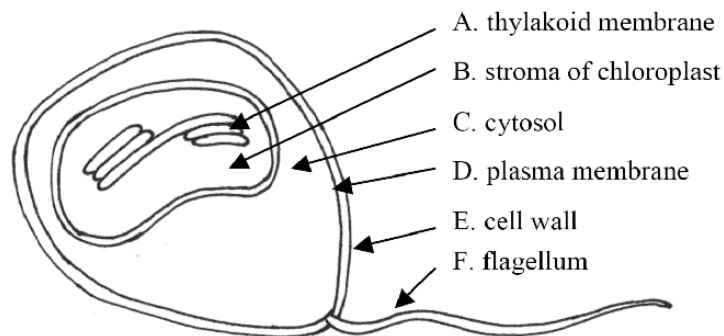
- I. They are known as farmer's friends as they are useful in control of weeds
- II. They do not have teeth, therefore, gizzard helps in grinding of their food.
- III. They can reduce the cost of buying expensive fertilizers

- a) Only I b) Both I & II c) Both II & III d) I, II, III

84. Endoplasmic reticulum 'does not' perform

- a) Manufacture of fat
- b) Digestion of foreign materials
- c) Biogenesis of membranes
- d) Detoxification of toxins

85. The diagram shows a single celled green alga. Its chloroplast and several other components are labelled



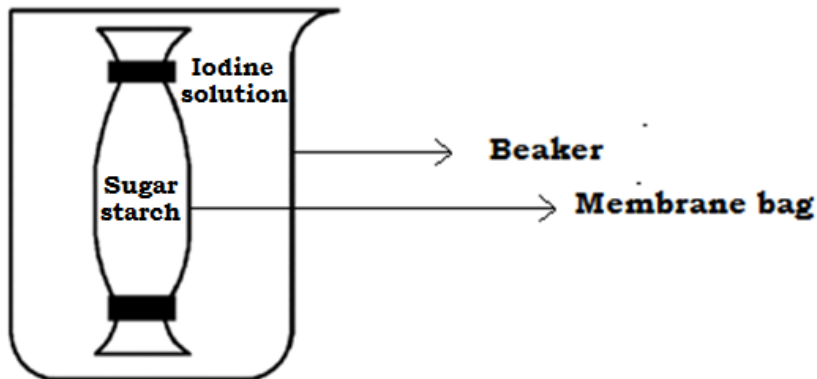
The components that consist the following are

- 1) Photosynthetic pigments
- 2) Starch
- 3) Ribosomes
- 4) Macromolecular polymers that prevent the cell from bursting

Now match the components with the structured mentioned above

| | 1 | 2 | 3 | 4 |
|----|---|---|-----|---|
| a) | A | B | B/C | E |
| b) | B | A | A/C | D |
| c) | A | E | C | F |
| d) | A | B | B | F |

86. The organelles of eukaryotic cells, involved in energy conversions, are
- a) Ribosomes, Mitochondria b) Mitochondria and Chloroplasts
 c) Chloroplasts only d) Mitochondria only
87. The figure shows an experiment with a membrane bag in a beaker with diluted iodine solution (orange – brown).



Which colour would you expect in the beaker and the membrane bag after several hours?

- | In the Beaker | in the membrane bag |
|----------------------|----------------------------|
| a) Orange – brown | Orange – brown |
| b) Colourless | Colourless |
| c) Blue – black | Blue – black |
| d) Orange – Brown | Blue – black |
88. Mismatched combination(s) in the following is/are
- | Column –A | Column – B |
|----------------------|-------------------------|
| I. Lysosome | Digestive enzymes |
| II. Nucleus | Genetic information |
| III. Plasma membrane | Nucleic acids (DNA/RNA) |
- a) I only b) II only c) III only d) All of the above
89. There are different ways for getting rid of wastes in our surroundings. Suggest the best ways of treating the following wastes
 P= Plastics, Q= Medical waste, R= Agricultural waste
- a) P → Burning; Q → Recycle; R → Composting
 b) P → Recycle; Q → Burning; R → Composting
 c) P → Reuse; Q → Burning; R → Burning
 d) P → Recycle; Q → Reuse; R → Composting
90. Which of the following is not a proper waste management practice?
- a) Using fruit wastes in vermi composting
 b) Using paper and rice husk for making articles
 c) Burning dried leaves and broken plastic toys
 d) Carrying a jute bag while shopping
91. The locomotory structures in majority of insects
- a) 3 pairs of legs and 3 pairs of wings
 b) 2 pairs of legs and 2 pairs of wings
 c) 3 pairs of legs and 2 pairs of wings
 d) 2 pairs of legs and 3 pairs of wings
92. The elbow joint is similar to this joint in its structure and movement
- a) Joint between upper jaw and rest of the head
 b) Joint between the bones of skull
 c) Knee joint d) Joint between the vertebrae in back bone

93. Study the following statements

- I. snakes move forward very fast and in a straight line
- II. The streamlined body of a fish helps in easy movements in water
- III. Tiny bristles (setae) present under the body help in providing the grip on the ground during its movements in earthworm
- IV. The shell helps in moving from place to place in snails
- V. A muscle can push and pull during the body movements

How many of the above statements are true and correct?

- a) Two only b) Three only c) Four only d) All are correct

94. **Assertion (A):** Locomotion is a movement but all movements are not locomotions.

Reason (R): In locomotion, the organism moves from one place to the other for the sake of food/shelter/reproduction/protection but all movements may not result in moving place to place

- a) Both A and R are correct and R is the correct explanation of A
- b) Both A and R are correct and R is not the explanation of A
- c) A is true but R is false d) A is false & R is true

95. Three plants F, G and H of different habitats and their adaptations(r, s, t, u, v and w) are tabulated below where

- r= well developed root system
- s= well developed shoot system
- t= reduced rate of transpiration
- u= sunken stomata (leaf pores)
- v= reduced shoot system
- w= reduced root system

| Plant | Adaptations |
|-------|-------------|
| F | r & s |
| G | r & v |
| H | s & w |

Which among these is a xerophyte (desert plant) and which another adaptation can be noticed in it, in addition to the existing one?

- a) F → u b) G → t c) H → u d) F → t

96. Observe the following events noticed during various metabolic activities of green plants

- P = Oxygen is released, mostly during the day time
- Q = pollen grains are transferred during the day/ night time
- R = Carbon-di-oxide is released both during the day and night time
- S = water vapour is released mostly during the day time

Pick out the correct option from the below

| | Photosynthesis | Transpiration | Reproduction | Respiration |
|---|----------------|---------------|--------------|-------------|
| a | P | Q | R | S |
| b | Q | R | S | P |
| c | S | P | P | Q |
| d | P | S | Q | R |

97. Following are the characteristic features observed in birds

- (i) Jaws are modified into beak or bill
- (ii) Breast bones are modified to hold the flight muscles
- (iii) Web is seen between the toes of hind limbs
- (iv) Fore limbs are modified into wings
- (v) Hind limbs have scales and toes are with claws.

Which of the above, do you feel, best suited for flying?

- a) i & v b) ii & iv c) iii & v d) i & iii

98. Find the aquatic organism which has no gills but possesses blow holes which allow it to breath

- a) Prawn b) Fish c) Sea gull d) Dolphin

99. Which adaptation of deer does not help it to protect itself from its predators?

- a) Long ears b) Eyes located on sides of head
c) Speed running d) Strong teeth

100. Which of the following can be quoted as the most defining property of living things, applicable to all the organisms, without any exception?

- a) Reproduction b) Locomotion
c) Growth d) Response to the external stimuli

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VISTO - 2015 - 16
SEASON - II ANSWER KEY
TO
CLASS - VI

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