

For Class VII students (7th)

CODE: VIDWAN-LAVA-F1-02-0003

Time Allotted: 2 Hrs.

Maximum Marks : **240**

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

INSTRUCTIONS

A. General Instructions

1. This booklet is your Question paper containing **60 questions**. All questions are compulsory.
2. The question paper having Scientific Aptitude, Maths & General Science.

Marking Scheme :

+4 for correct answer **NO NEGATIVE MARKS FOR WRONG ANSWER.**

3. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers, and electronic gadgets in any form are not allowed to be carried inside the examination hall.
4. Fill in the boxes provided below on this page and also write your **Name & Enrollment No.** In the space provided.
5. The answer sheet, a machine-readable (OMR), is provided separately.
6. **DO NOT TAMPER WITH/ MUTILATE THE OMR OR THE BOOKLET.**
7. Do not open the question-paper booklet before being instructed to do so by the invigilators.

B. Filling the OMR

8. On the Response sheet, write in Black Ball Point Pen, your name, your Enrollment No. and Name of the Centre. **Do not write these anywhere else.**
9. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
10. Use Only **Black Ball Point Pen** to Darken the OMR Sheet

FORMULA ONE TEST

Date.:20- 11 - 2016

2nd EDITION

Name of the Candidate	-----
Father's Name	-----
Enrollment No.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



SCIENTIFIC APTITUDE

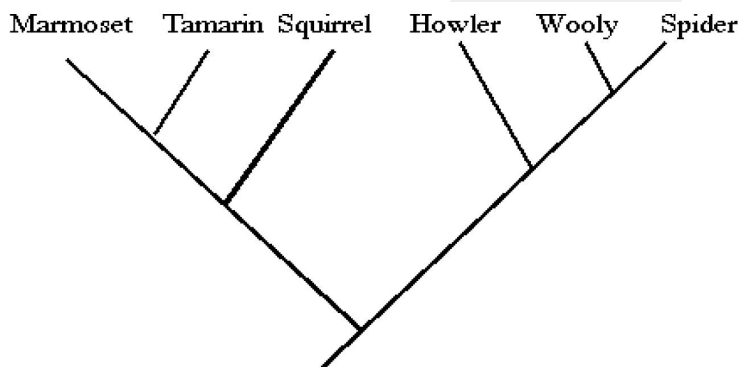
01. Scientists have determined that three classes of genes (named A, B, and C) control development of the four flower parts: Sepals, Petals, Stamen, and Carpels. Genes A and C mutually repress each other. Gene B is not regulated by either Genes A or C. The expression pattern of these genes in wild-type flowers is shown below, where +++ indicates gene activity.

Flower Formation				
	Sepals	Petals	Stamen	Carpels
Gene A	+++	+++		
Gene B		+++	+++	
Gene C			+++	+++

A mutation in Gene C, which prevents its expression, will result in which of the following floral patterns?

- (a) Sepals-Petals-Stamen-Carpels
 - (b) Sepals-Petals-Petals
 - (c) Sepals-Petals-Petals-Sepals
 - (d) Sepals-Petals-Petals-Carpels
02. An inbred strain of plants has a mean height of 24 cm. A second strain of the same species also has a mean height of 24 cm. When these plants are crossed, the F₁ are also 24 cm. However, when the F₁ plants are crossed, the F₂ plants show a wide range of heights; the majority of F₂ are like P₁ and F₁, but approximately 4 of 1000 are only 12 cm tall and 4 of 1000 are 36 cm tall. What fraction of the F₂ plants will be 27 cm in height? [Assume that for the genes involved in determining plant height, each allele contributes the same amount.]

- (a) 3/4
- (b) 9/16
- (c) 56/256
- (d) None

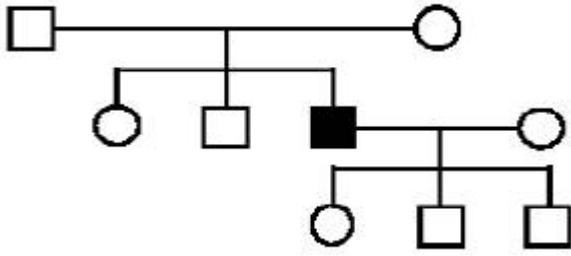


03.

A valid taxonomic group for this cladogram [above] would include:

- (a) Tamarin + Squirrel
- (b) Tamarin + Squirrel + Howler
- (c) Squirrel + Howler + Woolly
- (d) Woolly + Spidere

04. Given the following pedigree:



What is (are) the possible mode(s) of inheritance?

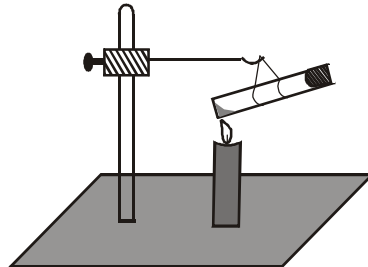
- I. Autosomal dominant
- II. Autosomal recessive
- III. X-linked dominant
- IV. X-linked recessive

- (a) II only
- (b) I or III only
- (c) II or IV only
- (d) All four modes of inheritance (I, II, III and IV)

05. Color-blindness is a recessive, X-linked trait. A couple, who are both blood type A and who both have normal vision, have a son who is blood type O and colorblind. What is the probability that their next child will be a daughter who is blood type O and has normal vision?

- (a) 1/2
- (b) 1/4
- (c) 1/8
- (d) 1/16

06. The mouth of test tube having small quantity of water is fitted with a cork. This test tube is suspended freely with the help of a stand as shown in figure. Test tube is heated so that the water in it is converted into steam. We observe that .



- (a) Both test tube and cork move to the right side to conserve linear momentum
- (b) Both test tube and cork move to the left side to conserve linear momentum
- (c) Test tube moves to the left side and the cork moves to the right side to conserve linear momentum
- (d) Test tube remains in its position but the cork moves to the right side to conserve linear momentum

07. **40% of 1640 + ? = 35% of 980 + 150% of 850**
 (a) 372
 (b) 842
 (c) 962
 (d) 1052
08. **In terms of percentage profit, which is the best transaction ?**
- | | <u>C.P. (in Rs.)</u> | <u>Profit (in Rs.)</u> |
|-----|----------------------|------------------------|
| (a) | 36 | 17 |
| (b) | 50 | 24 |
| (c) | 40 | 19 |
| (d) | 60 | 29 |
09. **If $(4x^2 - 3y^2) : (2x^2 + 5y^2) = 12 : 19$, then $(x : y)$ is :**
 (a) 2 : 3
 (b) 1 : 2
 (c) 3 : 2
 (d) 2 : 1
10. **If $x^2 + 4y^2 = 4xy$, then $x : y$ is :**
 (a) 2 : 1
 (b) 1 : 2
 (c) 1 : 1
 (d) 1 : 4
11. **A man can do a job in 15 days. His father takes 20 days and his son finishes it in 25 days. How long will they to complete the job if they all work together ?**
 (a) Less than 6 days
 (b) Exactly 6 days
 (c) Approximately 6.4 days
 (d) More than 10 days
12. **A man can do a piece of work in 5 days, but with the help of his son, he can do it in 3 days. In what time can the son do it alone ?**
 (a) $6\frac{1}{2}$ days
 (b) 7 days
 (c) $7\frac{1}{2}$ days
 (d) 8 days
13. **A, B, C enter into a partnership investing Rs. 35,000, Rs. 45,000 and Rs. 55,000 respectively. The respective shares of A, B, C in an annual profit of Rs. 40,500 are :**
 (a) Rs. 10,500, Rs. 13,500, Rs. 16,500
 (b) Rs. 11,500, Rs. 13,000, Rs. 16,000
 (c) Rs. 11,000, Rs. 14,000, Rs. 15,500
 (d) Rs. 11,500, Rs. 12,500, Rs. 16,500

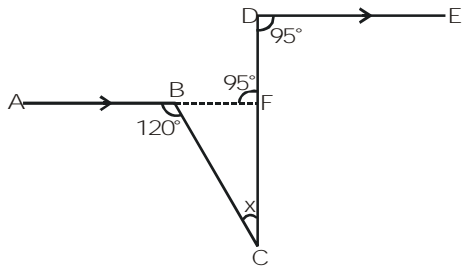
14. Shekhar started a business investing Rs. 25,000 in 1999. In 2000, he invested an additional amount of Rs. 10,000 and Rajeev joined him with an amount of Rs. 35,000. In 2001, Shekhar invested another additional amount of Rs. 10,000 and Jatin joined them with an amount of Rs. 35,000. What will be Rajeev's share in the profit of Rs. 1,50,000 earned at the end of 3 years from the start of the business in 1999 ?
- (a) Rs. 45,000
 (b) Rs. 50,000
 (c) Rs. 70,000
 (d) Rs. 75,000
15. **Assertion** : A quadrilateral is a parallelogram if its opposite sides are equal.
Reason : If the diagonals of a quadrilateral bisect each other, then the quadrilateral is a parallelogram.
- (a) If both Assertion and Reason are true and the Reason is correct explanation of the Assertion.
 (b) If both Assertion and Reason are true but Reason is not correct explanation of the Assertion.
 (c) If Assertion is true but the Reason is false .
 (d) If Assertion is false but Reason is true.

MATHEMATICS

16. If the mean of numbers 27, 31, 89, 107, 156 is 82, then the mean of 130, 126, 68, 50, 1 is-
- (a) 75
 (b) 157
 (c) 82
 (d) 80
17. The correct formula is :
- (a) Median + A.M. = 2 × Mode
 (b) Median – A.M. = Mode
 (c) 3(A.M.) – 2(Median) = Mode
 (d) 3(Median) – 2(A.M.) = Mode
18. A card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a spade or a king ?
- (a) $\frac{4}{13}$
 (b) $\frac{3}{13}$
 (c) $\frac{2}{13}$
 (d) $\frac{1}{13}$

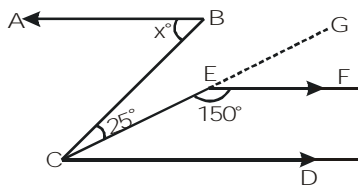
19. In a simultaneous throw of two dice, what is the probability of getting a total of 7 ?
- (a) $\frac{1}{6}$
 (b) $\frac{7}{12}$
 (c) $\frac{7}{36}$
 (d) $\frac{1}{4}$
20. The value of $23.\overline{43} + 5.\overline{2}$ is :
- (a) $\frac{2395}{990}$
 (b) $\frac{2527}{99}$
 (c) $\frac{5169}{990}$
 (d) $\frac{2837}{99}$
21. For any two rational numbers A and B, which of the following properties are correct?
- (i) $A < B$ (ii) $A = B$ (iii) $A > B$
- (a) Only (i) and (ii) are correct.
 (b) Only (ii) and (iii) are correct.
 (c) Only (ii) is correct.
 (d) All (i), (ii), (iii) are correct.
22. $\frac{1}{1+a^{(n-m)}} + \frac{1}{1+a^{(m-n)}} = ?$
- (a) 0
 (b) $\frac{1}{2}$
 (c) 1
 (d) a^{m+n}
23. $\frac{1}{1+x^{(b-a)} + x^{(c-a)}} + \frac{1}{1+x^{(a-b)} + x^{(c-b)}} + \frac{1}{1+x^{(b-c)} + x^{(a-c)}} = ?$
- (a) 0
 (b) 1
 (c) x^{a-b-c}
 (d) None of these

24. From the adjoining figure $AB \parallel DE$. Then the value of x° is :-



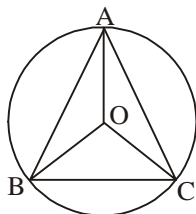
- (a) 25°
- (b) 35°
- (c) 45°
- (d) 55°

25. In figure, find x if $AB \parallel CD$.



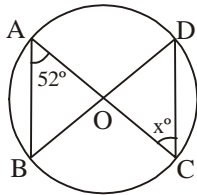
- (a) 45°
- (b) 55°
- (c) 60°
- (d) 70°

26. In the adjoining figure, O is the centre of the circle. If $\angle OBC = 25^\circ$, then $\angle BAC$ is equal to-



- (a) 25°
- (b) 30°
- (c) 65°
- (d) 150°

27 In fig. O is the centre of the circle. If $\angle BAC = 52^\circ$, then $\angle OCD$ is equal to–

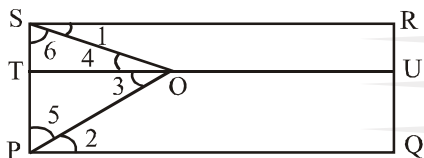


- (a) 52°
- (b) 104°
- (c) 128°
- (d) 76°

28. If two sides of a triangle are 6 cm and 8 cm, then the length of the third side is -

- (a) 7 cm
- (b) 2 cm
- (c) Greater than 2 cm and less than 14 cm
- (d) None of these

29. In this figure, $PQ \parallel TU \parallel SR$. Which of the following is true -



- (a) $\angle 1 + \angle 2 = \angle 3 + \angle 4$
- (b) $\angle 1 + \angle 2 = \angle 5 + \angle 6$
- (c) $\angle 1 + \angle 3 = \angle 2 + \angle 4$
- (d) All are true

30. The value of $\frac{6^{n+3} - 32 \cdot 6^{n+1}}{6^{n+2} - 2 \cdot 6^{n+1}}$ is equal to

- (a) 36
- (b) $1/6$
- (c) 2
- (d) None of these

GENERAL SCIENCE

31. Which of the following changes are caused by heat energy ?

- (A) Ice changing to water
- (B) Iron melting
- (C) Corpse decomposing
- (a) A,B,C are correct
- (b) A and B only are correct
- (c) B and C only are correct
- (d) A only is correct

32. The table below shows melting points and the boiling points of three substances.

Substance	Melting point ($^{\circ}\text{C}$)	Boiling point ($^{\circ}\text{C}$)
1	10	90
2	65	120
3.	24	78

At which temperature will all the substances be in the same state?

- (a) 25°C
 (b) 80°C
 (c) 75°C
 (d) 100°C
33. Given that 1 cal (about 4.2 J) of heat is required to raise the temperature of 1 g of water by 1°C , what will be the final temperature when 25.0 calories of heat are added to 5 g of water at 23°C ?
- (a) 28.0°C
 (b) 18.0°C
 (c) 21.8°C
 (d) 24.2°C
34. Water at 35°C is mixed with an equal mass of water at 90°C . If there are no heat losses to the surroundings, then what is the final temperature of the water mixture ?
- (a) 35°C
 (b) 90°C
 (c) 125.0°C
 (d) 62.5°C
35. Heat capacity has units as
- (a) J/kg.K
 (b) J/mol.K
 (c) J.ohm/sec.K²
 (d) W/m.K
36. Acceleration due to gravity of a body during free fall does not depend upon the
- (a) Mass of earth
 (b) Mass of body
 (c) Universal gravitational constant
 (d) Radius of earth
37. When an object is accelerated
- (a) Its direction must be constant
 (b) Its velocity is necessarily changing
 (c) Its velocity is constant
 (d) Its speed is necessarily changing

38. **When wind speed increase,air pressures**
- Increase
 - Decrease
 - Remains constant
 - None of these
39. **A person moves a certain distance in a certain time .If 1/3 of the distance is covered in 2/3 of the time with speed V_1 and the rest of the 2/3 distance in 1/3 of the time in speed V_2 then V_1/V_2 is:**
- 1/2
 - 1/4
 - 4/9
 - 2/9
40. **A car travels at a speed of 80 km/hr for 15 minutes and then at a speed of 40 km/hr for the next 15 minutes. The average speed of the car is:**
- 15.7 m/s
 - 16.7 m/s
 - 17.7 m/s
 - 18.7 m/s
41. **Which of the following are true about the characteristics of incomplete combustion?**
- Insufficient oxygen is used to oxidise the carbons
 - Insufficient heat is supplied to burn the coals
 - Only one final product can be obtained, namely carbon dioxide.
- A,B,C are correct
 - A and B only are correct
 - B and C only are correct
 - A only is correct
42. **The flesh of some fruits, such as apples, will turn brown sometime after their waxy skin is cut. What is the role of the skin of the fruit?**
- Prevents exposure of carbon dioxide to the flesh
 - Prevents exposure of nitrogen to the flesh
 - Prevents exposure of oxygen to the flesh
 - Prevents exposure of water to the flesh
43. **It is observed that when a saturated glass of salt water is heated, it can take in more salt. How do you explain this?**
- The solubility of salt in water increases with temperature
 - The salt already present in the water decomposes with heat therefore water can dissolve more salt.
 - The salt already present in the water reacts with the water and changes the property of the water which enables it to dissolve more salt.
 - None of the above

44. Which of the following is an example of a solution?
- Milk
 - Blood
 - Mayonnaise
 - None of the above
45. What are the characteristics of electrophile molecules?
- Rich in electrons surrounding the atom
 - Poor in electrons surrounding the atom
 - More attracted to electron rich atoms
- A,B,C are correct
 - A and B only are correct
 - B and C only are correct
 - A only is correct
46. Which of the following are categorised as acids?
- Gastric juice in the stomach
 - Soap in water
 - Reaction of carbonate ions in water
- A,B,C are correct
 - A and B only are correct
 - B and C only are correct
 - A only is correct
47. Which of the statements below best describes salt water?
- Element
 - Compounds
 - Heterogenous mixture
 - Homogeneous mixture
48. Oil and water do not mix with each other. Which processes is suitable to separate the two insoluble liquids?
- Distillation
 - Evaporation
 - Filtration
 - Separating funnel
49. Which of the following is an example of chemical changes of a substance?
- Water boils at 100 Celsius
 - An iron nail rusting
 - Oil floating on water
 - None of the above

50. Which of the substances below can help increase the rate of chemical reaction?
- (a) Reactant
 - (b) Catalyst
 - (c) Inhibitor
 - (d) Radical initiator
51. Which of the following statements about non-flowering plants are correct?
- (A) They are structurally more complex than flowering plants
 - (B) They carry out photosynthesis.
 - (C) They reproduce by spores
- (a) A,B,C are correct
 - (b) A and B only are correct
 - (c) B and C only are correct
 - (d) A only is correct
52. What glycolytic product is shuttled to the mitochondria in aerobic respiration?
- (a) Acetyl-CoA
 - (b) Fumarate
 - (c) Succinyl-CoA
 - (d) Pyruvate
53. Which group of plants has vascular tissue but does not produce seeds?
- I. Mosses
 - II. Ferns
 - III. Gymnosperms
- (a) I
 - (b) II
 - (c) III
 - (d) II & III
54. Which of the following is true for transport in xylem?
- (a) The primary force involved is osmotic pressure
 - (b) Xylem is the primary site for transport of sucrose
 - (c) Movement through xylem depends mainly on transpiration
 - (d) All of the above
55. In the fern life cycle, the dominant generation is the:
- (a) Haploid gametophyte
 - (b) Diploid gametophyte
 - (c) Haploid sporophyte
 - (d) Diploid sporophyte

56. **Transport of which nutrient across the intestinal epithelium is by passive diffusion?**
- (a) Alanine
 - (b) Fructose
 - (c) Glucose
 - (d) Glutamine
57. **Which two brain centers control mammalian respiration?**
- (a) Medulla oblongata and substantia nigra
 - (b) Medulla oblongata and pons
 - (c) Medulla oblongata and red nucleus
 - (d) Substantia nigra and red nucleus
58. **You are trying to isolate glyoxysomes and peroxisomes from a mixture of cellular organelles using differential centrifugation. After a few centrifugation steps, you think you may have a relatively pure suspension. How might you determine that your suspension does indeed include these organelles?**
- (a) Do an assay for the enzyme catalase
 - (b) Do an assay for the enzyme succinate dehydrogenase
 - (c) Do an assay for the presence of nucleic acids
 - (d) Examine microscopically for a double membrane bound organelle
59. **An animal experiences an acid-base imbalance in the arterial blood that results in acidosis. To increase pH toward normal, which direction would the ventilation rate be changed and what would be the corresponding change in arterial P_{CO_2} ?**
- (a) Ventilation rate increases, arterial P_{CO_2} increases
 - (b) Ventilation rate increases, arterial P_{CO_2} decreases
 - (c) Ventilation rate decreases, arterial P_{CO_2} increases
 - (d) Ventilation rate decreases, arterial P_{CO_2} decreases
60. **In plant cells grown in the presence of a metabolic poison that specifically inhibits mitochondrial F_1ATP synthase, one would expect:**
- (a) The overall pH difference across the cristae to be altered
 - (b) The electron transport chain to become inoperative
 - (c) Photosynthesis efficiency to be improved
 - (d) oxygen consumption to cease

" Dream, Dream Dream, Dreams transform into thoughts.

And thoughts result in action "

— Dr. A.P.J. Abdul Kalam



