

For Class VIII students (8th)

CODE: VIDWAN-LAVA-F1-02-0004

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="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>



SCIENTIFIC APTITUDE

01. Of the following sets of data the only one that does not determine the shape of a triangle is:

- (a) The ratio of two sides and the included angle
- (b) The ratios of the three altitudes
- (c) The ratios of the three medians
- (d) The ratio of the altitude to the corresponding base

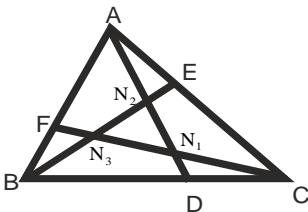
02. $\left(\frac{(x+1)^2(x^2-x+1)^2}{(x^3+1)^2} \right)^2 \cdot \left(\frac{(x-1)^2(x^2+x+1)^2}{(x^3-1)^2} \right)^2$ equals

- (a) $(x+1)^4$
- (b) $(x^3+1)^4$
- (c) 1
- (d) $[(x^3+1)(x^3-1)]^2$

03. In the figure, \overline{CD} , \overline{AE} and \overline{BF} are one-third of their respective sides. It follows that

$\overline{AN_2} : \overline{N_2N_1} : \overline{N_1D} = 3 : 3 : 1$, and similarly for lines BE and CF

Then the area of triangle $N_1N_2N_3$ is:



- (a) $\frac{1}{10} \Delta ABC$
- (b) $\frac{1}{9} \Delta ABC$
- (c) $\frac{1}{7} \Delta ABC$
- (d) None of these

04. A circular piece of metal of maximum size is cut out of a square piece and then a square piece of maximum size is cut out of the circular place. The total amount of metal wasted is:

- (a) 1/4 the area of the original square
- (b) 1/2 the area of the original square
- (c) 1/2 the area of the circular piece
- (d) 1/4 the area of the circular piece

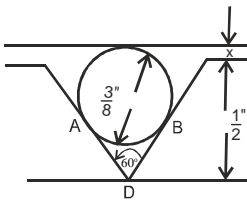
05. The logarithm of $27\sqrt[4]{9} \sqrt[3]{9}$ to the base is 3 is:

- (a) $8\frac{1}{2}$
- (b) 5
- (c) 3
- (d) None of these

06. The expression $\frac{2x^2 - x}{(x + 1)(x - 2)} - \frac{4 + x}{(x + 1)(x - 2)}$ cannot be evaluated for $x = -1$ or $x = 2$, since division by zero is not allowed. For other values of x :

- (a) The expression takes on many different values.
- (b) The expression has only the value 2
- (c) The expression has only the value 1
- (d) The expression always has a value between -1 and $+2$

07. In the diagram if points A, B, C are points of tangency, then x equals:

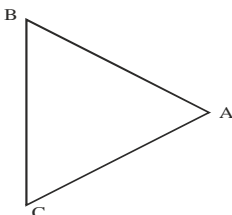


- (a) $\frac{3''}{16}$
- (b) $\frac{1''}{8}$
- (c) $\frac{1''}{32}$
- (d) $\frac{1''}{16}$

Direction-(Q.No. 08 & 09):- Answer the question based on the following information.

A cow is tethered at point A by a rope. Neither the rope nor the cow is allowed to enter the triangle ABC.

$$\angle BAC = 30^\circ, AB = AC = 10\text{m}$$



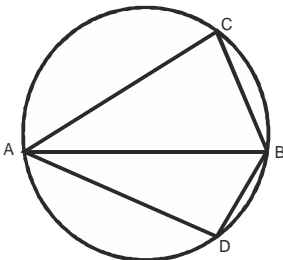
08. What is the area that can be grazed by the cow if the length of the rope is 8m?

- (a) $134\pi\frac{1}{3}$ sq.m
- (b) 121π sq.m
- (c) 132π sq.m
- (d) $\frac{176\pi}{3}$ sq.m

09. What is the area that can be grazed by the cow if the length of the rope is 12m?

- (a) $134\pi\frac{1}{3}$ sq.m
- (b) 121π sq.m
- (c) 132π sq.m
- (d) $\frac{176\pi}{3}$ sq.m

10. AB is diameter of the given circle, while points C and D lie on the circumference as shown. If AB is 25 cm, AC is 20 cm and BD is 7cm, find the area of the quadrilateral ACBD.



- (a) 160 sq.cm
 - (b) 240 sq.cm
 - (c) 320 sq.cm
 - (d) None of these
11. The value of each of a set of coins varies as the square of its diameter, if its thickness remains constant, varies as the thickness, if the diameter remains constant . If the diameter of two coins are in the ratio 3:4, what should be the ratio of their thickness be if the value of the second is four times that of the first?
- (a) 9:16
 - (b) 4:9
 - (c) 16:9
 - (d) 9:4

12. If a, b and c are the sides of a triangle, and $a^2 + b^2 + c^2 = bc + ca + ab$, then the triangle is:
- Equilateral
 - Isosceles
 - Right- angled
 - Obtuse- angled
13. Let $x = 1640, y = 1728$ and $z = 448$. How many natural numbers are there that divide at least one amongst x, y, z .
- 47
 - 48
 - 49
 - 50
14. Mini and Vinay are quiz masters preparing for a quiz. In x minutes, Mini makes y questions more than Vinay. If it were possible to reduce the time needed by each to make a question by two minutes, then in x minutes Mini would make $2y$ questions more than Vinay. How many questions does Mini make in x minutes ?
- $\frac{1}{4} \left[2(x+y) - \sqrt{(2x^2 + 4y^2)} \right]$
 - $\frac{1}{4} \left[2(x-y) - \sqrt{(2x^2 + 4y^2)} \right]$
 - Either a or b
 - $\frac{1}{4} \left[2(x-y) - \sqrt{(2x^2 - 4y^2)} \right]$
15. Two men and a woman are entrusted with a task. The second man needs three hours more to cope with the job than the first man and the woman would need working together. The first man, working alone, would need as much time as the second man and the woman working together. The first man, working alone, would spend eight hours less than the double period of time the second man would spend working alone. How much time would the two men and the woman need to complete the task if they all worked together?
- 2 hours
 - 3 hours
 - 4 hours
 - 5 hours
16. If $x^2 + \frac{1}{x^2} = 62$, then the value of $x^4 + \frac{1}{x^4}$ is:
- $8^4 - 2^8 - 2$
 - $8^4 + 2$
 - $8^4 - 2^8 + 2$
 - $8^4 + 2^8 - 2$

17. If $a + 1 = b + 2 = c + 3 = d + 4 = a + b + c + d + 5$ then $(a + b + c + d)$ is equal to:

- (a) -5
- (b) $-10/3$
- (c) $-7/3$
- (d) $5/3$

18. The value of the expression

$$\sqrt{\frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{1}{\sqrt{4}+\sqrt{3}} + \dots \text{upto } 99 \text{ terms}} \text{ is equal to}$$

- (a) 9
- (b) 3
- (c) 1
- (d) 0

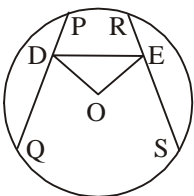
19. If A (5, 3), B (11, -5) and P (12, y) are the vertices of a right triangle right angled at P, then y =

- (a) -2, 4
- (b) -2, -4
- (c) 2, -4
- (d) 2, 4

20. If a variable takes the discrete values $\alpha + 4, \alpha - \frac{7}{2}, \alpha - \frac{5}{2}, \alpha - 3, \alpha - 2, \alpha + \frac{1}{2}, \alpha - \frac{1}{2}, \alpha + 5$ ($\alpha > 0$), then the median is-

- (a) $\alpha - \frac{5}{4}$
- (b) $\alpha - \frac{1}{2}$
- (c) $\alpha - 2$
- (d) $\alpha + \frac{5}{4}$

21. In the adjoining figure, O is the centre of the circle and PQ, RS are its equal chords, $OD \perp PQ$ and $OE \perp RS$. If $\angle DOE = 130^\circ$, then $\angle PDE$ is-



- (a) 50°
- (b) 65°
- (c) 40°
- (d) 70°

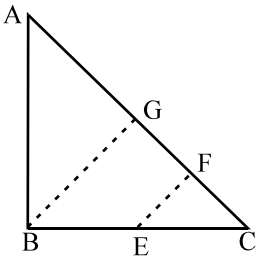
22.
$$\frac{((1986)^2 - 1992)(1986^2 + 3972 - 3)(1989)}{(1983)(1985)(1988)(1989)} =$$

- (a) 1983
- (b) 1986
- (c) 1987
- (d) 1989

23.
$$\sqrt{6 - \sqrt{6 - \sqrt{6 - \dots \infty}}}$$

- (a) -3
- (b) 3
- (c) -2
- (d) 2

24. In the given figure, ABC is a non-isosceles right angled triangle, $\angle B$ being a right angle. EF and BG are perpendiculars on the hypotenuse AC. Then, $\angle CEF$ is equal to –



- (a) $\angle ABG$
- (b) $\angle BAG$
- (c) $\angle ECF$
- (d) $\angle EFC$

25. Maya has Rs. M with her and her friend Chanda has Rs. C with her. Maya spends 12% of her money and Chand also spends the same amount as Maya did. What percentage of her money did chanda spend?

- (a) $\frac{18M}{C}$
- (b) $\frac{18C}{M}$
- (c) $\frac{12M}{C}$
- (d) $\frac{12C}{M}$

26. A tradesman marks on article at Rs. 205 /- more than the cost price. He allows a discount of 10% on the marked price. Find the profit percent if the cost price is Rs. x

(a)
$$\frac{\left[\frac{x}{(18450)} - 10 \right]}{x}$$

(b)
$$\frac{[(18450)] - 10x}{x}$$

(c)
$$\frac{\left[\frac{x}{(18450)} - 100 \right]}{x}$$

(d)
$$\frac{\left[\frac{18450}{x} - 100 \right]}{x}$$

27. There are two qualities of milk- Amul and Sudha having different prices per litre, their volumes being 130 litres and 180 litres respectively. After equal amounts of milk was removed from both, the milk removed from Amul was added to Sudha and vice- versa. The resulting two types of milk now have the same price. Find the amount of milk drawn out from each type of milk:

- (a) 58.66
- (b) 75.48
- (c) 81.23
- (d) None of these

28. One bad day, at 7 a.m I started on my bike at the speed of 36 kmph to meet one of my relatives .After I had travelled some distance, my bike went out of order and I had to stop .After resting for 35 minutes, I returned home on foot at a speed of 14 kmph and reaches home at 1 p.m. Find the distance from my house at which my bike broke down.

- (a) 54km
- (b) 63km
- (c) 72km
- (d) None of these

29. At a game of billiards , A can give B 15 points in 60 and A can give C 20 in 60 . How many points can B give C in a game of 90 ?

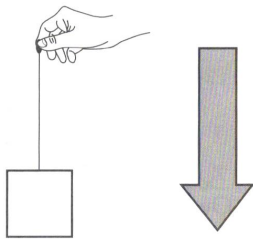
- (a) 11
- (b) 13
- (c) 10
- (d) 14

30. Two oranges, three bananas and four apples cost Rs 25. Three oranges, two bananas and one apple cost Rs 20. I brought 3 oranges, 3 bananas and 3 apples. How much did I pay?

- (a) Rs 22.5
- (b) Rs 27
- (c) Rs 30
- (d) Cannot be determine

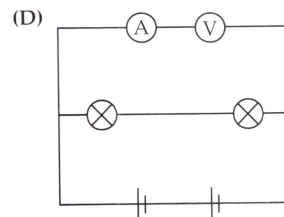
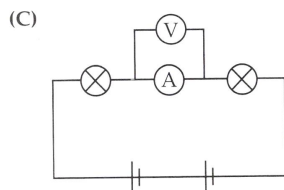
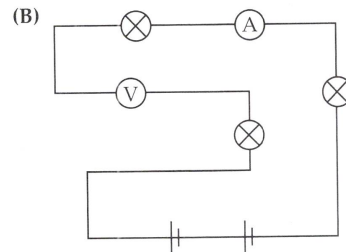
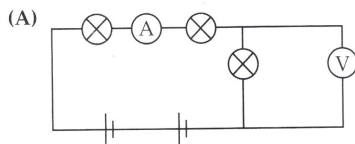
GENERAL SCIENCE

31. Joan is holding a string attached to a box as shown in the diagram below. She is moving her hand downward and as such, the block moves downward as well.



Where is the direction of the force exerted by the string on the block?

- (a) Upwards
 - (b) Downwards
 - (c) Horizontal
 - (d) Not enough to determine the direction of the force
32. Which of the following forces is able to change the direction of rolling steel ball?
- (a) Frictional force
 - (b) Gravitational force
 - (c) Pressure force
 - (d) Magnetic force
33. Which of the following shows is the correct way of connecting an ammeter and a voltmeter?



34. Who weighs the lightest?

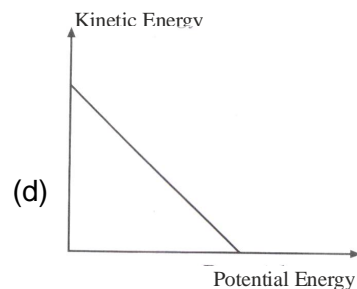
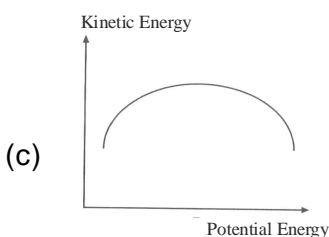
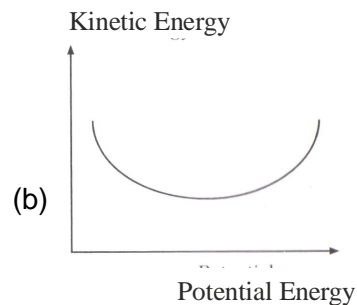
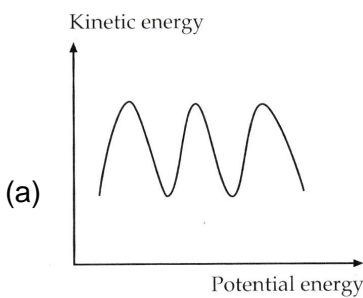
- (a) A 70-kg astronaut at outer space
- (b) A 10-year old boy standing at the North Pole
- (c) A 10-year old boy staying in Singapore
- (d) B and C are both the lightest.

35. Which energy conversion takes place when a guitar string is plucked?



- (a) Potential energy → Kinetic energy + Heat energy
- (b) Potential energy → Kinetic energy + Sound energy
- (c) Kinetic energy → Potential energy + Heat energy + Sound energy
- (d) Chemical energy → Potential energy + Kinetic energy

36. Joan swings to and fro. Which graph best describes how her kinetic energy changes with her gravitational potential energy while swinging?



- 37. Which of the following is NOT the effect of a force?**
- A car moves slower when you hit the break
 - Your hands become warm when you rub them against each other
 - You are still able to make a call from your handphone when you are inside a lift
 - A glass breaks when it falls from a certain height and hits the floor.
- 38. Which of the following cases describes a condition where friction is NOT useful at all?**
- Friction between the tyres on cars and the ground
 - Friction between the sports shoes and the ground
 - Friction between the parts in a machine
 - Friction between the brakes and the wheels on cars
- 39. Food is consumed by a person and enables him to move his hand to lift up a ball to a certain height. The ball is released and hits the floor causing a loud sound. Which of the following is the correct step-by-step energy conversion of the ball?**
- Chemical potential energy → gravitational potential energy → kinetic energy
 - Chemical potential energy → kinetic energy → gravitational potential energy → kinetic energy → sound energy
 - Elastic energy → kinetic energy → gravitational potential energy → sound energy
 - Kinetic energy → gravitational potential energy → kinetic energy + chemical energy → sound energy
- 40. A bicycle travels at 50km/h for 2 hours. The remaining 30km is covered at 60 km/h. What is the average speed of the bicycle?**
- 55 km/h
 - 50km/h
 - 52 km/h
 - 65km/h
- 41. Which amongst the following is not the property characterized by vulcanized rubber?**
- It does not melt upon heating
 - It is resistant to chemical attack
 - It is an insoluble thermoset polymer
 - It possesses weak covalent bonds
- 42. Which of the following tips is incorrect as per PCRA?**
- Driving should be done at a constant speed
 - Engine should be kept running at traffic lights.
 - Correct tyre pressure should be maintained
 - Regular maintenance of vehicle should be done.
- 43. Beryllium shows diagonal relationship with-**
- Mg
 - Na
 - Al
 - B

44. Halide ore out of the following is -

- (a) Cinnabar
- (b) Horn Silver
- (c) Limonite
- (d) Galena

45. Stainless steel is so called because of its _____.

- (a) High strength
- (b) High corrosion resistance
- (c) High ductility
- (d) Brittleness

46. Noble metal

- (a) Al
- (b) Ag
- (c) Mo
- (d) W

47. Kevlar is commercial name for _____.

- (a) Glass fibers
- (b) Carbon fibers
- (c) Aramid fibers
- (d) Cermets

48. The synthetic fibres produced from _____ are known as rayon.

- (a) Lignin
- (b) Cellulose
- (c) Polyamides
- (d) Ethylene glycol

49. Purple-blue coloured glass is obtained by the addition of -

- (a) Chromium salts
- (b) Ferrous oxide
- (c) Cobalt salts
- (d) None of the above

50. The hydrophilic end of synthetic detergent is -

- (a) $\text{CH}_3(\text{CH}_2)_{10}\text{-CH}_2$
- (b) $-\text{CH}_3$
- (c) SO_3^- , Na^+
- (d) $-\text{COO}^-\text{Na}^+$

51. Which of the following cellular proteins make direct contact with chromosomes?
- (a) Centrosomes and microtubule-associated proteins
 - (b) Kinesins, myosins, and actin microfilaments
 - (c) Histones, condensins, and synaptonemal complexes
 - (d) All of the above
52. You find a plant that appears to have parallel veined leaves. Examination of its root indicates a single layered pericycle, primary xylem in the center of the root, and an active vascular cambium. The plant most likely belongs to which of the following groups?
- (a) Conifer
 - (b) Dicot
 - (c) Fern
 - (d) Gnetum
53. What observations would you NOT make when the body responds to a rapid increase of organic acids?
- (a) Decreased blood pH
 - (b) Decreased respiration rate
 - (c) Increased blood pressure
 - (d) Increased heart rate
54. ATP is an important molecule in metabolism because it:
- (a) Is readily obtained from an organism's environment.
 - (b) Is extremely stable.
 - (c) Contains valuable nutrients.
 - (d) Has high-energy phosphate bonds.
55. Haemocoel occurs in
- (a) Earthworm
 - (b) Hydra
 - (c) Cockroach and Pila
 - (d) Leech
56. ICVN is
- (a) International Code of Veterinary Nomenclature
 - (b) International Code of Viral Nomenclature
 - (c) International Code of Vertebrate Nomenclature
 - (d) International Code of Verma Nomenclature

57. Quinine is extracted from

- (a) Leaves of Occimum
- (b) Bark of Cinchona
- (c) Bark of Cinnamon
- (d) Stem of Hevea

58. Karyotaxonomy studies

- (a) Biochemicals
- (b) Secondary metabolites
- (c) Chromosomes
- (d) All the above

59. What would happen if *Spirogyra* is placed in salt-water?

- (a) It will swell due to osmosis.
- (b) Protoplasm shrinks due to plasmolysis.
- (c) There is no change in the filament.
- (d) None of the above.

60. What acts as an anchoring structure in algae?

- (a) Hold-fast
- (b) Lamina
- (c) Stipe
- (d) None of these

**" It is very easy to defeat someone,
but it is very hard to win someone "**
— Dr. A.P.J. Abdul Kalam

