Name of the Candidate $\qquad$ $---1$
Test Date $\qquad$ $-$


Time Allowed: 1 Hour
Max. Marks : 160
V-SAT-2022 VIDYAPEETH SCHOLARSHIP-CUM-ADMISSION TEST
$\square$

## for

## 10th to 11th CLASS MOVING STUDENTS

GENERAL INSTRUCTIONS:
(i) There are four sections in this paper consisting PCMB having 40 questions.
(ii) For each correct answer 4 marks will be awarded and for each incorrect answer, 1 marks will be deduced.
(iii) Mark only one correct answer out of four alternatives.
(iv) Use Blue/Black Ball Point Pen only for writing particulars/ or any marking.
(v) Use of calculator is not allowed.
(vi) Darken the circles in the space provided only.
(vii) Use of white fluid or any other material which damages the answer sheet, is not permitted.

## MATHEMATICS (10 QUESTIONS)

## (Quadratic Equations, Circles, Surface Area and Volumes, Arithmetic Progression)

1. The sum of $n$ terms of two A.P's are in the ratio of ( $7 \mathrm{n}+1$ ):
$(4 \mathrm{n}+27)$. The ratio of their $11^{\text {th }}$ terms is -
a. $2: 3$
b. $4: 3$
c. $5: 4$
d. $5: 6$
2. If $a_{1}, a_{2}, a_{3}, \ldots . ., a_{n}$ are in A.P. and $a_{i}>0$ for all $I$, then: $\frac{1}{\sqrt{a_{1}}+\sqrt{a_{2}}}+\frac{1}{\sqrt{a_{2}}+\sqrt{a_{3}}}+\ldots+\frac{1}{\sqrt{a_{n-1}}+\sqrt{a_{n}}}=$
a. $\frac{n}{\sqrt{a_{1}}+\sqrt{a_{n}}}$
b. $\frac{n}{\sqrt{a_{n}}-\sqrt{a_{1}}}$
c. $\frac{n-1}{\sqrt{a_{1}}+\sqrt{a_{n}}}$
d. none of these
3. In the adjoining figure ' O ' is the centre of the circle of the circle and PQ, PR and ST are the three tangents. $\angle \mathrm{QPR}=50^{\circ}$, then the value of $\angle \mathrm{SOT}$ is:
a. $30^{\circ}$
b. $75^{\circ}$
c. $65^{\circ}$
d. Can't be determined

4. ABC is an isosceles triangle and $\mathrm{AC}, \mathrm{BC}$ are the tangents at M and N respectively. DE is the diameter of the circle. $\angle \mathrm{ADP}=\angle \mathrm{BEQ}=100^{\circ}$. What is value of $\angle \mathrm{PRD}$ ?
a. $60^{\circ}$
b. $50^{\circ}$
c. $20^{\circ}$
d. Can't be determined

5. In piece of paper is in the form of a right angle triangle in which the ratio of base and perpendicular is 3:4 and hypotenuse is 20 cm . What is the volume of the biggest cone that can be formed by taking right angle vertex of the paper as the vertex of the cone?
a. $\quad 45.8 \mathrm{~m}^{3}$
b. $\quad 56.1 \mathrm{~m}^{3}$
c. $\quad 61.5 \mathrm{~m}^{3}$
d. $48 \mathrm{~m}^{3}$
6. A cubical cake is cut into several smaller cubes by dividing each edge in 7 equal parts. The cake is cut from the top along the two diagonals forming four prisms. Some of them get cut and rest remained in the cubical shape. A complete cubical (smaller) cake was given to adults and the cut off part of a smaller cake is given to a child get the cake?
a. 343
b. 448
c. 367
d. 456
7. In a bullet the gun powder is to be filled up inside the metallic enclosure. The metallic enclosure is made up of a cylindrical base and conical top with the base of radius 5 cm . The ratio of height of cylinder and cone is $3: 2$. A cylindrical hole is drilled through the metal solid with height two - third the height of metal solid. What should be the radiús of the hole, so that the volume of the hole (in which gun powder is to be filled up) is one third the volume of metal solid after drilling?
a. $\sqrt{\frac{88}{5}} \mathrm{~cm}$
b. $\sqrt{\frac{55}{8}} \mathrm{~cm}$
c. $\frac{55}{8} \mathrm{~cm}$
d. $33 \pi \mathrm{~cm}$
8. A single reservoir supplies the petrol to the whole city, while the reservoir is fed by a single pipeline filling the reservoir with the stream of uniform volume. When the reservoir is full and if 40000 litres of petrol is used is used daily, the supply fails in 90 days. If 32000 litres of petrol is used daily, the supply fails in 60 days. How much petrol can be used daily without the supply ever failing?
a. 64000 litres
b. 56000 litres
c. 78000 litres
d. 60000 litres
9. In town, $\frac{2}{3}$ of men are married to $\frac{3}{7}$ of the women. In the town total population is more than 1000. If all marriages happen within the town. The smallest possible number of total population is (assume there are only adults in the town)
a. 1012
b. 1035
c. 1058
d. None of these
10. The quadratic equation $3 x^{2}+2\left(a^{2}+1\right) x+a^{2}-3 a+2=$ 0 possesses roots of opposite sign then a lies in:
a. $(-\infty, 0)$
b. $(-\infty, 1)$
c. $(1,2)$
d. $(4,9)$

## PHYSICS (10 QUESTIONS)

## (CURRENT ELECTRICITY, MAGNETIC EFFECT OF ELECTRIC CURRENT)

11. A current of 1 A is drawn by a filament of an electric bulb, Number of electrons passing through a crosssection of the filament in 16 seconds would be roughly
a. $10^{20}$
b. $10^{10}$
c. $10^{18}$
d. $10^{23}$
12. What is the minimum resistance which can be made using five resistors each of $(1 / 5) \Omega$ ?
a. $(1 / 5) \Omega$
b. $(1 / 25) \Omega$
c. $(1 / 10) \Omega$
d. $25 \Omega$
13. Two resistors of resistance $2 \Omega$ and $4 \Omega$ when connected to a battery will have
a. same current flowing through then when connected in parallel
b. Same current flowing through them when connected in series
c. same potential difference across them when connected in series
d. different potential difference across them when connected in parallel
14. The equivalent resistance between the terminals $X$ and $Y$ of the circuit is
a. $1 \Omega$
b. $3 \Omega$
c. $5 \Omega$
d. $8 \Omega$

15. If in the circuit, power dissipation is 150 W , then $R$ is
a. $2 \Omega$
b. $6 \Omega$
c. $5 \Omega$
d. $4 \Omega$

16. Our students plotted the sketch of the patterns of magnetic field lines representing the magnetic field around a current carrying straight wire as shown in figures $A, B, C$ and $D$. Which of the sketches is correct?

17. A circular loop is suspended in air as shown in figure. When the loop is seen from above, current flows anti clock wise and when seen from below, current flows clock wise. His loop behaves as a magnet. The N - pole of this magnet is one
a. the upper face
b. lower face
c. the lower face if current is large
d. upper face if current is large

18. A soft iron bar is enclosed by a coil of insulated copper wire as shown in figure. When the plug of the key is closed, the face B of the iron bar marked as

a. $\quad \mathrm{N}$-pole
b. S-pole
c. N - pole if current is large
d. $S$ - pole if current is small
19. A current flows in a conductor from east to west. The direction of the magnetic field at a point above the conductor is
a. towards north
b. towards south
c. towards east
d. towards west
20. An electron is travelling horizontally towards east. A magnetic field in vertically downward direction exerts a force on the electron along
a. east
b. west
c. north
d. south

CHEMISTRY (10 QUESTIONS)
(CARBON AND ITS COMPOUND PERIODIC CLASSIFICATION OF ELEMENTS)
21. Graphite is used as a lubricant in machines because
a. It is a good conductor of electricity.
b. It has a high melting point and slippery layers
c. Its density ranges from 1.9 to $2.3 \mathrm{~g} / \mathrm{cm}^{3}$
d. It is strong and soft
22. Which of the following substance produces brisk effervescence with baking soda solution?
a. Ethanoic acid
b. Table salt
c. Vinegar
d. Sunflower oil
23. What is denatured alcohol?
a. Ethyl alcohol which has been made unfit for drinking purpose by adding small amount of poisonous substance.
b. Methyl alcohol which has been made unfit for drinking purpose by adding small amount of poisonous substance
c. Alcohol having properties of an acid
d. Ethyl alcohol containing $60 \%$ of water by weight
24. Which of the following is the major constituent of the liquefied petroleum gas?
a. Methane
b. Ethane
c. Propane
d. Butane
25. Which of the following statements about graphite and diamond is true?
a. They have the same crystal structure
b. They have the same degree of hardness
c. They have the same electrical conductivity
d. They can undergo the same chemical reactions
26. The property of self-linkage among identical atoms to form long chain compounds is known as:
a. Catenation
b. Isomerisation
c. Superposition
d. Halogenation
27. Which of the following compounds of carbon does not consist of ions?
a. $\mathrm{CHCl}_{3}$
b. $\mathrm{CaCO}_{3}$
c. $\mathrm{NaHCO}_{3}$
d. $\mathrm{Ca}_{2} \mathrm{C}$
28. Which of the following belongs to homologous series of alkynes?
$\mathrm{C}_{6} \mathrm{H}_{6}, \mathrm{C}_{2} \mathrm{H}_{6}, \mathrm{C}_{2} \mathrm{H}_{4}, \mathrm{C}_{3} \mathrm{H}_{4}$
a. $\mathrm{C}_{6} \mathrm{H}_{6}$
b. $\mathrm{C}_{2} \mathrm{H}_{4}$
c. $\mathrm{C}_{2} \mathrm{H}_{6}$
d. $\mathrm{C}_{3} \mathrm{H}_{4}$
29. A metal ' $M$ ' is in the first group of the Periodic Table. What will be the formula of its oxide?
a. MO
b. $\mathrm{M}_{2} \mathrm{O}$
c. $\mathrm{M} 2 \mathrm{O}_{3}$
d. $\mathrm{MO}_{2}$
30. The atom of an element has electronic configuration 2, 8, 7. To which of the following elements would it be chemically similar?
a. $\quad N(7)$
b. $P(15)$
c. $\mathrm{Na}(11)$
d. $F(9)$
31. The unicellular organism which reproduces by budding is
a. Spirogyra
b. Planaria
c. Yeast
d. Hydra
32. This is concerned with asexual reproduction.
a. Zygote
b. Spore
c. Gamete
d. Gonad
33. A multicellular organism reproducing asexually by regeneration is
a. Planaria
b. Cockroach
c. Taenia
d. Sugarcane
34. Attainment of sexual maturity is called
a. Puberty
b. Adolescence
c. Growth
d. Development
35. In the human female, fertilisation of the ovum takes place in
a. Uterus
b. Ovary
c. Fallopian tube
d. Vagina
36. The process of release of the egg from the ovary is called
a. Menstruation
b. Ovulation
c. Oogenesis
d. None of these
37. Vegetative reproduction is a form of
a. Sexual reproduction
b. Asexual
reproduction
c. Both of them
d. None of these
38. The genetic constitution of an organism is called
a. Genotype
b. Phenotype
c. Variation
d. Chromosomes
39. The allele which is unable to express its effect in
the presence of another is called
a. Co-dominant
b. Dominant
c. Recessive
d. Complementary
40. In human beings sex of baby is determined at the time of
a. intercourse
b. Gamete formation
c. Parturition
d. Fertilisation

