

VILLUPURAM DISTRICT

LS

EXAM NUMBER

SSLC SECOND REVISION EXAMINATION 2019-20

Time Alloted: 3 hours

MATHEMATICS

Maximum Marks : 100

SECTION - I (Marks 14)

NOTE : Answer all the 14 questions.**14 × 1 = 14**

- If there are 1024 relations from a set $A = \{1,2,3,4,5\}$ to a set B, then the number of elements in B is
(a). 3 (b). 2 (c). 4 (d). 8
- If $f : A \rightarrow B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to
(a). 7 (b). 49 (c). 1 (d). 14
- $7^{4k} \equiv \dots \pmod{100}$
(a). 1 (b). 2 (c). 3 (d). 4
- A man saves Rs.320 in January, Rs.360 in February, Rs.400 in March and so on. What will be his savings in the month of November in the same year?
(a). Rs.1000 (b). Rs.6160 (c). Rs.720 (d). Rs.800
- The solution of the system $x + y - 3z = -6$, $-7y + 7z = 7$, $3z = 9$ is
(a). $x = 1, y = 2, z = 3$ (b). $x = -1, y = 2, z = 3$ (c). $x = -1, y = -2, z = 3$ (d). $x = 1, y = 2, z = -3$
- The roots of the equation $4x^2 - 2x - 8 = 0$ are
(a). Real and equal (b). Real and unequal (c). Not real (d). Irrational
- A line which intersects a circle at two distinct points is called
(a). point of contact (b). secant (c). diameter (d). tangent
- The point of intersection of $3x - y = 4$ and $x + y = 8$ is
(a). (5, 3) (b). (2, 4) (c). (3, 5) (d). (4, 4)
- The value of 'x' if the slope of the line joining (2,5) and (x, 3) is 2
(a). 4 (b). 3 (c). 2 (d). 1
- $a \cot \theta + b \operatorname{cosec} \theta = p$ and $b \cot \theta + a \operatorname{cosec} \theta = q$, then $p^2 - q^2$ is equal to
(a). $a^2 - b^2$ (b). $b^2 - a^2$ (c). $a^2 + b^2$ (d). $b - a$
- The curved surface area of a right circular cone of height 15 cm and base diameter 16cm is
(a). $60\pi \text{ cm}^2$ (b). $68\pi \text{ cm}^2$ (c). $120\pi \text{ cm}^2$ (d). $136\pi \text{ cm}^2$
- If the radius of the base of a cone is tripled and height is doubled then the volume is
(a). made 6 times (b). made 18 times (c). made 12 times (d). unchanged
- The range of the data 8, 8, 8, 8, 8, 8 is
(a). 0 (b). 1 (c). 8 (d). 3
- The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$, then the value of x is
(a). 2 (b). 1 (c). 3 (d). 1.5

SECTION - II (Marks : 20)

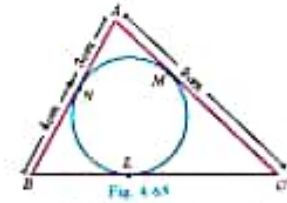
Note : Answer 10 questions . Question Number 28 is compulsory**10 × 2 = 20**

- If $X = \{-5, 1, 3, 4\}$ and $Y = \{a, b, c\}$, then which of the following relations are functions from X to Y?
(i). $R_1 = \{(-5, a), (1, a), (3, b)\}$ (ii). $R_2 = \{(-5, b), (1, b), (3, a), (4, c)\}$
- $f(x) = 2x^4 + x^2 + 1$ and $g(x) = \sqrt{x}$. Find $f \circ g$.
- In a theatre, there are 20 seats in the front row and 30 rows were allotted. Each successive row contains two additional seats than its front row. How many seats are there in the last row?
- Find the sum of the series : $31 + 33 + \dots + 53$.
- The hill in the form of a right triangle has its foot at (19, 3). The inclination of the hill to the ground is 45° . Find the equation of the hill joining the foot and top
- Five years ago, Viswaa was thrice as old as Abdul. Ten years later, Viswaa will be twice as old as Abdul. How old are Viswaa and Abdul?

21. Solve $2x^2 - 5x + 2 = 0$ by formula method.

22. If $A = \begin{bmatrix} 7 & 8 & 6 \\ 1 & 3 & 9 \\ -4 & 3 & -1 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 11 & -3 \\ -1 & 2 & 4 \\ 7 & 5 & 0 \end{bmatrix}$, then find $2A + B$.

23. In figure $\triangle ABC$ is circumscribing a circle. Find the length of BC.



24. From the top of a tree of height 13 m the angle of elevation and depression of the top and bottom of another tree are 45° and 30° respectively. Find the height of the second tree. ($\sqrt{3} = 1.732$).

25. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter is 14 cm and the height of the vessel is 13 cm. Find the capacity of the vessel.

26. If the base area of a hemispherical solid is 1386 sq. metres, then find its total surface area?

27. Two unbiased dice are rolled once. Find the probability of getting a greater than 10.

28. If the range and coefficient of range of the data are 20 and 0.2 respectively, then find the largest and smallest values of the data.

SECTION - III (Marks : 50)

NOTE : Answer 10 questions. Question Number 42 is compulsory .

10 × 5 = 50

29. Let $A = \{ 1, 2, 3, 4 \}$ and $B = \{ 2, 5, 8, 11, 14 \}$ be two sets. Let $f: A \rightarrow B$ be a function given by $f(x) = 3x - 1$.

Represent this function (i) arrow diagram (ii). a table form (iii) set of ordered pairs (iv). graphical form

30. If $f(x) = x - 1$, $g(x) = 3x + 1$, $h(x) = x^2$ then, Prove that composition function is associative.

31. If $S_n = (x + y) + (x^2 + xy + y^2) + (x^3 + x^2y + xy^2 + y^3) + \dots$ n terms the prove that

$$(x - y)S_n = \left[\frac{x^2(x^n - 1)}{x - 1} - \frac{y^2(y^n - 1)}{y - 1} \right]$$

32. Find the GCD of $6x^3 - 30x^2 + 60x - 48$ and $3x^3 - 12x^2 + 21x - 18$.

33. If α, β are the roots of the equation $x^2 - 3x + 1 = 0$, then form the equation whose roots are $\frac{1}{\alpha + \beta}$ and $\frac{1}{\alpha\beta}$.

34. If $A = \begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 \\ -4 & 2 \end{pmatrix}$, $C = \begin{pmatrix} -7 & 6 \\ 3 & 2 \end{pmatrix}$. Verify that $A(B + C) = AB + AC$.

35. If the points $A(2,2), B(-2, -3), C(1, -3), D(x, y)$ form a parallelogram then find the value of x and y .

36. The mid points of the sides of a triangle are $(5, -3), (-5, 3)$ and $(6, 6)$. Find the equation of the sides.

37. State and Prove Thales Theorem

38. If $\frac{\cos \alpha}{\cos \beta} = m$ and $\frac{\cos \alpha}{\sin \beta} = n$, then prove that $(m^2 + n^2) \cos^2 \beta = n^2$.

39. A right circular cylinder having diameter 12 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 12 cm and diameter 6 cm, having a hemispherical shape on top. Find the number of such cones which can be filled with the ice cream available.

40. Find the variance and standard deviation of the wages of 9 workers given below.

Rs.310, Rs.290, Rs.320, Rs.280, Rs.300, Rs.290, Rs.320, Rs.310, Rs.280.

41. In a class of 50 students, 28 opted for NCC, 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selected at random. Find the probability that (i). The student opted for NCC but not NSS. (ii). The student opted for NSS but not NCC. (iii). The student opted for exactly one of them.

42. A man saved Rs.16500 in ten years. In each year after the first he saved Rs.100 more than he did in the preceding year. How much did he save in the first year?

SECTION - IV (Marks : 16)

NOTE : Answer both questions.

2 × 8 = 16

43. (a) Draw a triangle ABC of base BC = 8 cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that $BD = 6$ cm. (OR)

(b). Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle ABC [scale factor $\frac{4}{5}$]

44. (a). Draw the graph of $(2x - 3)(x + 2) = 0$ and state its nature of solution (OR)

(b) Draw the graph of $y = x^2 + 4x + 3$ and hence solve $x^2 + x + 1 = 0$.