

# SSLC FIRST REVISION EXAMINATION 2019-20

## MATHEMATICS

Time Allowed : 3.00 Hours]

[Max. Marks : 100

### SECTION - I (Marks : 14)

Note : Answer all the questions.

14x1=14

1.  $A = \{a, b, p\}$ ,  $B = \{2, 3\}$ ,  $C = \{p, q, r, s\}$ , then  $n[(A \cup C) \times B]$  is \_\_\_\_\_  
(a) 8 (b) 20 (c) 12 (d) 16
2. If  $A$  is the set of even numbers less than 8 and  $B$  is the set of prime numbers less than 7, then the number of relations from  $A$  to  $B$   
(a)  $2^9$  (b)  $9^2$  (c)  $3^2$  (d)  $2^7$
3. The sum of the exponents of the prime factors in the prime factorization of 1729 is  
(a) 1 (b) 2 (c) 3 (d) 4
4. 7<sup>th</sup> term of a GP 2, 6, 18, ..... is  
(a) 5832 (b) 2919 (c) 1458 (d) 729
5. If  $(x-6)$  is the HCF of  $x^2 - 2x - 24$  and  $x^2 - kx - 6$ , then the value of  $k$  is  
(a) 3 (b) 5 (c) 6 (d) 8
6. Graph of a linear polynomial is a  
(a) Straight line (b) Circle (c) Parabola (d) Hyperbola
7. If order of  $A, B, C$  are  $3 \times 4, 5 \times 4$  and  $5 \times 8$  then the order of  $(AB^T C)$  is  
(a)  $8 \times 3$  (b)  $3 \times 8$  (c)  $3 \times 4$  (d)  $4 \times 5$
8. In a  $\Delta ABC$ ,  $AD$  is the bisector of  $\angle BAC$  If  $AB = 8$  cm,  $BD = 6$  cm and  $DC = 3$  cm. Then length of the side  $AC$  is  
(a) 6 cm (b) 4 cm (c) 3 cm (d) 8 cm
9. If  $(5, 7), (3, p)$  and  $(6, 6)$  are collinear, then the value of  $p$  is  
(a) 3 (b) 6 (c) 9 (d) 12
10. The equation of straight line passes through  $(-4, 3)$  and having slope  $\frac{1}{2}$  is  
a)  $x - 2y + 10 = 0$  b)  $x - 2y - 10 = 0$  c)  $x + 2y + 10 = 0$  d)  $x + 2y - 10 = 0$
11.  $\tan \theta \operatorname{cosec}^2 \theta - \tan \theta$  is equal to  
(a)  $\sec \theta$  (b)  $\cot^2 \theta$  (c)  $\sin \theta$  (d)  $\cot \theta$
12. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be  
(a) 12 cm (b) 10 cm (c) 13 cm (d) 5 cm
13. The sum of all deviations of the data from its mean is .....  
(a) Always positive (b) Always negative (c) Zero (d) non-zero integer
14. In a single throw of die, the probability of getting a multiple of 3 is  
(a)  $\frac{1}{2}$  (b)  $\frac{1}{3}$  (c)  $\frac{1}{6}$  (d)  $\frac{2}{3}$

### SECTION II - (Marks : 20)

Answer any 10 questions. Q.No.28 is compulsory.

10 x 2 = 20

15. Let  $A = \{1, 2, 3\}$  and  $B = \{x \mid x \text{ is a prime number less than } 10\}$ . Find  $A \times B$  and  $B \times A$ .
16. Show that the function  $f: \mathbb{N} \rightarrow \mathbb{N}$  defined by  $f(m) = m^2 + m + 3$  is one - one function.
17. Find the HCF of 252525 and 363636.
18. Find the number of terms in the A.P. 3, 6, 9, 12, ..... 111.
19. Find the LCM of polynomials  $a^2 + 4a - 12$  and  $a^2 - 5a + 6$  whose GCD is  $(a-2)$ .
20. If the difference between the roots of the  $x^2 - 13x + k = 0$  is 17. Find  $k$ .
21. Define - Diagonal Matrix
22. A man goes 18 m due east and then 24 m due north. Find the distance of his current position from the starting point?

23. Show that the points  $(-2,5)$ ,  $(6,-1)$  and  $(2,2)$  are collinear.
24. Prove that  $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$
25. From the top of a rock  $50\sqrt{3}$  m high, the angle of depression of a car on the ground is observed to be  $30^\circ$ . Find the distance of the car from the rock.
26. If the ratio of radii of two spheres is  $4:7$ , find the ratio of their volumes.
27. A die is rolled and a coin is tossed simultaneously. Find the probability that the die shows an odd number and the coin shows a head.
28. How many terms of the series  $1+4+16+\dots$  Make the sum 1365?

**SECTION – III - (Marks : 50)**

Answer any 10 questions. Q.No.42 is compulsory.

**10 x 5 = 50**

29. The function 't' which maps temperature in Celsius (c) into temperature in Fahrenheit (F) is defined by  $t(c) = F$ . Where  $F = \frac{9}{5}C + 32$ . Find (i).  $t(0)$  (ii).  $t(28)$  (iii).  $t(-10)$  (iv). the value of C when  $t(C) = 212$  (v). the temperature when the Celsius value is equal to the Fahrenheit value.
30. If  $f(x) = 2x + 3$ ,  $g(x) = 1 - 2x$  and  $h(x) = 3x$ . Prove that  $f \circ (g \circ h) = (f \circ g) \circ h$ .
31. In a G.P the 9<sup>th</sup> term is 32805 and 6<sup>th</sup> term is 1215. Find the 12<sup>th</sup> term.
32. Find the sum of  $15^2 + 16^2 + 17^2 + \dots + 28^2$
33. A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of the both trains.
34. If  $A = \begin{pmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{pmatrix}$ ,  $B = \begin{pmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{pmatrix}$  verify that  $(AB)^T = B^T A^T$ .
35. Show that in a triangle, the medians are concurrent.
36. Find the area of the quadrilateral formed by the points  $(8,6)$ ,  $(5,11)$ ,  $(-5,12)$  and  $(-4,3)$ .
37. Two ships are sailing in the sea on either sides of a light house. The angle of elevation of the top the light house as observed from the ships are  $30^\circ$  and  $45^\circ$  respectively. If the light house is 200 m high, find the distance between the two ships. ( $\sqrt{3} = 1.732$ )
38. If the radii of the circular ends of a frustum which is 45 cm high are 28 cm and 7 cm. Find the volume of the frustum.
39. A solid sphere of radius 6 cm is melted into a hollow cylinder of a uniform thickness. If the external radius of the base of the cylinder is 5 cm and its height is 32 cm, then find the thickness of the cylinder.
40. Find the co-efficient of variation of 24, 26, 33, 37, 29, 31
41. A coin is tossed thrice. Find the probability of getting exactly two heads or atleast one tail or consecutive two heads.
42. Find the square root of  $289x^4 - 612x^3 + 970x^2 - 684x + 361$ .

**SECTION – IV - (Marks : 16)**

Note : Answer both questions.

**2 X 8 = 16**

43. (a) Construct a triangle similar to a given triangle PQR with its sides equal to  $\frac{7}{4}$  of the corresponding sides of the triangle PQR. (Scale factor  $\frac{7}{4} > 1$ )
- (OR)
- (b) Draw the two tangents from a point which is 10 cm away from the centre of a circle of radius 5 cm. Also, measure the lengths of the tangents.
44. (a) Draw the graph of  $y = x^2 - 4x + 3$  and use it to solve  $x^2 - 6x + 9 = 0$  (OR)
- (b) Draw the graph of  $y = 2x^2 - 3x - 5$  and hence solve  $2x^2 - 4x - 6 = 0$ .