

नेपाल सरकार
शिक्षक सेवा आयोग

निम्नमाध्यमिक तह, तृतीय श्रेणी, शिक्षक पदको खुला प्रतियोगितात्मक विषयगत परीक्षा -२०८२

विषय : गणित

पूर्णाङ्क : १००

समय : ३ घण्टा

उत्तीर्णाङ्क : ४०

सबै प्रश्नहरू अनिवार्य छन् । प्रत्येक खण्डका लागि बेग्लाबेग्लै उत्तरपुस्तिका प्रयोग गर्नुपर्नेछ, अन्यथा उत्तर पुस्तिका रद्द हुनेछ

Section - A

1. What are the stages of Piaget's theory of cognitive development? Explain how this theory guides for mathematics instruction at the lower secondary level.	4+ 6
2. Discuss the interrelationship among fractions, decimals, and percentages. How would you design a classroom activity to help students convert among these forms?	6+ 4
3. Explain the concept of quadratic equation along with the nature of roots to teach in the classroom. Also demonstrate the procedure for teaching factors of algebraic expression $px^2 + qx + c$. Mention the strategies for teaching H.C.F. and L.C.M.	2+ 4+ 4
4. a) How do you teach your students to construct a parallelogram when the length of two sides and the angle between them be given? b) State Pythagoras theorem and discuss its use in finding the distance between two points, (x_1, y_1) and (x_2, y_2) .	5 1+ 4
5. a) What are set operations? Discuss each of them with suitable examples showing them in Venn diagrams. b) Illustrate the differences between mean and median with suitable examples. Explain how you teach median of a discrete data to your students.	1+ 2 2+ 3

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Section - B

6. a) Write the converse, inverse, contrapositive and negation of the statement - "All scientists are brilliant." Prove that for any two statements 'p' and 'q', $(p \wedge q) \wedge \sim (p \vee q)$ is a contradiction.	5
b) In an infinite series of concentric circles, if the diameter of the largest circle is 48 cm. and the diameter of the succeeding circles is $\frac{2}{3}$ that of the preceding circle, find the sum of the areas of the infinite series.	5

7. Define matrix and determinant. What are the basic differences between matrix and determinant? Solve the following equations by using matrix inverse method: $x - 2y - z = -7$ $2x + y + z = 0$ $3x - 5y + 8z = 13$	1+3+6
8. Show that the homogeneous equation of second degree $ax^2 + 2hxy + by^2 = 0$ always represents a pair of straight lines through the origin. Find the equation of straight lines through origin and at right angles to the lines $x^2 - 5xy + 4y^2 = 0$.	5+5
9. a) State Euclid's fifth postulate with figure. Also, write any three properties of parallelograms. b) Prove theoretically that the angle at the center of the circle is double of the angle at the circumference standing on the same arc of the circle.	2+3 5
10. A fair coin is tossed 4 times, let X be number of heads obtained. a) Calculate probability distribution of X. b) Calculate mean and variance of the distribution. c) Justify whether this is a binomial distribution.	3+3+1
