

नेपाल सरकार
शिक्षक सेवा आयोग
निम्न माध्यमिक तह, तृतीय श्रेणी, शिक्षक पदको
खुला प्रतियोगितात्मक विषयगत परीक्षा – २०८१

विषय : गणित

समय : ३ घण्टा

पूर्णाङ्क : १००

उत्तीर्णाङ्क : ४०

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

Group A

1. Explain the benefits of incorporating group activities based on Bruner's theory in teaching Mathematics to the students of Lower Secondary Level. Also, discuss the role of peer interaction in group activities based on Bruner's theory for promoting collaborative problem-solving skills among the students.	6+ 4
2. a) How would you teach the area of a triangle with base (b) and height (h) = $\frac{1}{2} \times b \times h$ in the classroom?	5
b) If two bags of fertilizer can be sown in $\frac{4}{5}$ parts of a farmer's field, how many parts of that field can be sown by one bag of fertilizer? How do you solve this problem while teaching in the classroom?	5
3. How do you find factors of $x^2 + 3x + 2$ by using algebraic block in the classroom? In addition to the algebraic block, which method is suitable for teaching this concept? Explain your answer with examples.	5+ 5
4. What are the major differences between the concepts of congruency and similarity relations on triangles in school geometry? Justify logically that congruency implies similarity but not conversely. Also, prove that the sum of three exterior angles of a triangle is 360° by explaining suitable procedures.	4+ 2+ 4
5. a) What do you understand by union of sets? How do you teach your students - $N(A \cup B) = n(A) + n(B) - n(A \cap B)$?	2+ 2
b) Illustrate the differences between median and mode with suitable examples. How do you teach your students that mean $(\bar{X}) = (\sum fx) / N$ with examples, where the symbols have their usual meaning?	3+ 3

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Group B

6. Define linear programming with appropriate terminologies. Maximize : $P = x + 2y + z$ subject to $x - y + 2z \leq 10$, $2x + y + 3z \leq 12$, $x \geq 0$, $y \geq 0$, $z \geq 0$ by simplex method.		4+6														
7. What is meant by determinant? Mention its properties and solve the following equations by row equivalent method: $x - 3y - 7z = 6$, $2x + 3y - z = 9$, $4x + y = 7$		2+2 +6														
8. Define intercepts of a line on axes. Derive an equation of a straight line which makes x-intercept 'a' and y-intercept 'b'. Find the equation of a straight line which makes equal and opposite intercepts on axes and passing through (4, 3).		1+5 +4														
9. a) Write any five properties of a parallelogram.		5														
b) Prove theoretically that the diagonals of a parallelogram bisect each other.		5														
10. a) Find the arithmetic mean of the following data:		5														
<table border="1"><tr><td>Height (m)</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td></tr><tr><td>No. of plants</td><td>2</td><td>3</td><td>9</td><td>21</td><td>11</td><td>5</td></tr></table>		Height (m)	10	20	30	40	50	60	No. of plants	2	3	9	21	11	5	2+2 +1
Height (m)	10	20	30	40	50	60										
No. of plants	2	3	9	21	11	5										
b) A fair dice is rolled. What is the probability of getting: i) an even number? ii) a number greater than 3? iii) the number 7?																
