

नेपाल सरकार
शिक्षक सेवा आयोग

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

तह : माध्यमिक

पूर्णाङ्क : १००

समय : ३ घण्टा

उत्तीर्णाङ्क : ४०

विषय : गणित

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

Group (A)

1. How would you use the concept of distance between two points to connect geometry with algebra? Give an example and describe how you would teach it.	4 + 2 + 4
2. How can you explain the geometric representation of the complex number $z = 2+3i$ on the Argand diagram; and how would you help students understand the concept of the modulus and argument of this number?	1 0
3. Describe how you would introduce the concept of conic section using real-life examples. What teaching aids would you use to make the concept concrete?	5 + 5
4. Use the concept of two regressions co-efficients to calculate co-relation co-efficient. Find two regressions co-efficients given by two equations $Y=2X$ and $6X-Y=4$ then how do you teach co-relation co-efficient by using these equations.	2 + 8
5. Critically analyze the role of formative and summative assessments in teaching mathematics at the Secondary level. Suggest how would you balance both in classroom practice.	6 + 4

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Group (B)

6. What are the key differences between the limit of a function as x approaches a point and continuity of function at that point? How does each concept relate to the graph? Prove that if a function 'f' is differentiable at a point 'a', then it is continuous at the point 'a' but converse may not be true.	4 + 6
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7. (a) Briefly introduce Euclidean geometry and write down its key features. How does it differ from non-Euclidean geometry? (b) What type of differential equation is called the homogeneous differential equation? Solve the given differential equation: $dy/dx = (y + x) / x$	1 + 3 + 1 1 + 4														
8. Write the implications of Piaget's and Bruner's theory in classroom teaching.	5 + 5														
9. Calculate the median from the following frequency distribution. <table border="1"><thead><tr><th>Mark s</th><th>0-20</th><th>20-40</th><th>40-50</th><th>50-60</th><th>60-80</th><th>80-100</th></tr></thead><tbody><tr><td>No. of stud ents</td><td>50</td><td>100</td><td>150</td><td>90</td><td>60</td><td>50</td></tr></tbody></table> Also, find the number of students getting marks between the first and third quartile.	Mark s	0-20	20-40	40-50	50-60	60-80	80-100	No. of stud ents	50	100	150	90	60	50	5 + 4 + 1
Mark s	0-20	20-40	40-50	50-60	60-80	80-100									
No. of stud ents	50	100	150	90	60	50									
10. (a) Write any 4 foundation of mathematics education. What do you understand by philosophy of mathematics? Why is it necessary for teachers to study it? (b) In the context of Nepal, ICT tools like mobile apps, different mathematics software and online learning platforms are being used to teach mathematics in school. Explain some major problems and challenges faced by teachers and students in Nepal while using these ICT tools in mathematics and suggest some ideas to solve these problems.	2 + 1 + 2 2 . 5 + 2 . 5														
