

SUMMATIVE ASSESSMENT – 1, JANUARY - 2022

MATHEMATICS PAPER – 1

(Modal Paper – 1)

Class: 10th

Max. Marks: 100

Time: 3hr 15 min

Instructions:

1. In the duration of 3hrs,15 min. 15 min of time is allotted to read the question paper.
2. All answers shall be written in the answer booklet only.
3. Question paper consists of 4 sections and 33 questions.
4. Internal choice is available in section IV only.
5. Answers shall be written neatly and legibly.

SECTION – I

Note:1. Answer all the questions in one word or phrase

2. Each question carries 1 mark.

12 × 1 = 12 M

1. The digit in unit place in the resultant number $5^{2022} \times 6^{2021}$
A) 0 B) 5 C) 6 D) 2
2. $A = \{1, 2, 3, 4\}$ and $B = \{2, 3, 5, 7\}$ then $n(A \cup B) =$ _____
A) 2 B) 4 C) 6 D) 8
3. If α and β are the zeroes of the polynomial $x^2 + 4x + 3$, then $\alpha^2 + \beta^2 =$ _____
A) 7 B) 25 C) 12 D) 10
4. Statement P: Degree of ' π ' is zero.
Statement Q: Degree of zero polynomial is zero
A) Both P and Q are true. C) P is true and Q is false
B) Both P and Q are false D) P is false and Q is true.
5. If $\sin \theta = \cos \theta$, then $2\tan^2 \theta + \sin^2 \theta =$ _____
6. $\sin \theta$ in terms of $\tan \theta =$ _____
7. The mean and mode are equal for the data 14, 15, 13, 15, a, b then the value of $a + b =$ ____
A) 15 B) 18 C) 33 D) 30
8. Match the following.
a) $\log_a 1$ () i) 2
b) $\log_a a$ () ii) 1
c) $\log_a a^2$ () iii) 0
A) a – i, b – ii, c – iii B) a – iii, b – ii, c – i C) a – iii, b – i, c – ii D) a – iii, b – ii, c – i

9. Which of the following is not probability of an event?

- A) 0 B) 1 C) 1.5 D) $\frac{1}{2}$

10. Assertion : If $P(E) = 0.05$, then $P(\bar{E}) = 0.95$

Reason : Probability of an event = $\frac{\text{number of favorable outcomes}}{\text{number of all possible outcomes}}$.

- A) Both Assertion and Reason are true. Reason is supporting the Assertion.
B) Both Assertion and Reason are true. Reason does not supporting the Assertion.
C) Assertion is true. Reason is false
D) Assertion is false. Reason is true.

11. If $A \subset B$, then $A \cup B =$ _____

12. If -4 is zero of the polynomial $x^2 - x - (2 + 2k)$ then the value of 'k' is _____

- A) 3 B) 9 C) 6 D) -9

Section – II

Note: 1. Answer all the questions.

2. Each question carries 2 marks.

$8 \times 2 = 16$ M

13. Use Euclid's division lemma to find the H.C.F 210 and 55?

14. Write the set builder form of set $A = \left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}\right\}$

15. Write an example to a quadratic polynomial having no zeroes.

16. Find a quadratic polynomial with zeroes -2 and $\frac{1}{3}$?

17. For what value of 'x', $\frac{5}{x}$ may be possible probability of an event?

18. Find the value of $\frac{2 \tan 30^\circ}{1 + \tan^2 30^\circ}$

19. Is the identity $\operatorname{cosec}^2 A - \cot^2 A = 1$ true for $0^\circ \leq A \leq 90^\circ$? If not for which value of A, it is true?

20. Convert the classes 1 – 10, 11 – 20, 21 – 30, 31 – 40, 41 – 50 as exclusive classes?

Section – III

Note: 1. Answer all the following questions.

2. Each question carries 4 marks.

$8 \times 4 = 32$ M

21. Find the zeros of the quadratic polynomial $x^2 - 2x - 8$ and verify the relationship between zeroes and co-efficient?

22. Is it true to say that $\sin(A + B) = \sin A + \sin B$? justify your answer by an example?

23. Find the value of 'x' if $2 \log 5 + \frac{1}{2} \log 9 - \log 3 = \log x$?

24. If $\log(x^2 + y^2) = \log x + \log y + \log 2$, then prove that $x = y$?

25. Write the formula to find median to a grouped frequency distribution table and explain the terms involved in it?
26. A bag contains cards numbered from 1 to 50. A card is drawn at random from the bag. Find the probability that it bears two-digit number which is multiple of 7?
27. Check whether $3x^4 + 5x^3 - 7x^2 + 2x + 2$ is a multiple of $x^2 + 3x + 1$ or not?
28. $A = \{1, 3, 5, 7, 9\}$ and $B = \{2, 3, 5, 7\}$ then verify that $n(A \cup B) = n(A) + n(B) - n(A \cap B)$?

Section – IV

Note: 1. Answer all questions

2. Each question carries 8 marks.

3. Each question has internal choice

5 × 8 = 40 M

29. If $A = \{x / x \text{ is a prime number less than } 15\}$ and $B = \{x/x \text{ is odd number less than } 10\}$ then find (i) $(A - B) \cup (B - A)$ (ii) $(A \cup B) - (A \cap B)$

OR

If $\log 2 = 0.3010$ and $\log 3 = 0.4771$, then find the values of (i) $\log 6$ (ii) $\log \sqrt{24}$?

30. A lot of 20 bulbs contain 4 defective ones. One bulb is drawn at random from the lot. What is the probability that this bulb defective? Suppose the bulb drawn in previous case is not defective and is not replaced. Now one bulb is drawn at random from the rest. What is the probability that this bulb is not defective?

OR

If $(3.5)^x = (0.35)^y = 1000$ then find the value of $\frac{1}{x} - \frac{1}{y}$.

31. Prove that $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{1 + \sin \theta}{\cos \theta}$

OR

If $\sec \theta + \tan \theta = P$, then show that $\sin \theta = \frac{P^2 - 1}{P^2 + 1}$.

32. Find the mean of the following data in step deviation method?

C. I	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34
frequency	15	110	135	115	25

OR

Find the other zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$?

33. Draw the graph of $x^2 - 4x + 5$ and find its zeroes.

OR

Draw the “greater than ogive” to the following data?

Classes	50 – 55	55 – 60	60 – 65	65 – 70	70 – 75	75 – 80
Frequency	2	8	12	24	38	16

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