SUMMATIVE ASSISEMENT – 1, JANUARY - 2022

MATHEMATICS PAPER – 1

(Modal Paper – 3)

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**

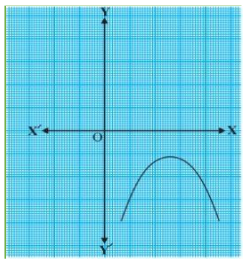
1. If a and b are co-primes, then H.C.F(a, b) = _____

   A) a B) ab C) 1 D) 0

2. A and B are two disjoint sets. Then _____

   A) $A \cap B = \emptyset$ B) A – B = B – A C) AUB = $A \cap B$ D) All the above are true

3. Graph of a quadratic polynomial $ax^2 + bx + c$ is given in adjacent figure. Then for that quadratic polynomial _____



   A) a < 0, No real zeroes C) a > 0, No real zeroes

   B) a < 0, Two distinct zeroes D) a > 0, Two distinct zeroes.

4. Statement P: 0 < P(E) < !

   Statement Q: P(E) + P($\overline{E}$) = 0

   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 tan α = $\frac{1}{\sqrt{3}}$ and sin β = $\frac{1}{\sqrt{2}}$ then α + β = _____

6. Given 3sin A – 2cos A = 0. Then tan A = _____-

7. In the formula $u_i = \frac{x_i - a}{h}$, the letter 'a' represents _____

8. Match the following.

   a) Cos 0^0 ( ) i) $\log_2 1$

   b) Sin 0^0 ( ) ii) $\log_2 2$

   c) Tan 45^0 ( ) iii) $\log_2 3$

   A) a – i, b – ii, c – iii B) a – i, b – ii, c – ii C) a – ii, b – i, c – ii D) a – i, b – iii, c – ii

9. Assertion : Sin A = $\frac{4}{3}$ does not exist for the angle A, if $0^0 < A < 90^0$.

   Reason : Sin A is always less than 1.

   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.

10. If n(AUB) = n(A) + n(B) then A and B are _____ sets.

11. The mean of first 'n' natural numbers is _____

    A) $\frac{n(n+1)}{2}$ B) $\frac{n+1}{2}$ C) n D) $\frac{n}{2}$

12. Degree of zero polynomial is _____

    A) 3 B) 1 C) 0 D) Not define

Section – II

Note: 1. Answer all the questions.

2. Each question carries 2 marks. **8 × 2 = 16 M**

13. Find the value of $\log_2(1 + \tan 45°)^2$
14. Write the set builder form of the set A = {2, 5, 10, 17}
15. Give an example a polynomial that has one zero? How will you verify if it has only one zero?
16. Find the zeroes of the polynomial x^2 - 3?
17. What is the probability of for drawing out a red king from a deck of cards?
18. Show that $\tan 48^0.\tan 16^0.\tan 42^0.\tan 74^0 = 1$
19. Find the value of cosec A $-\frac{1}{\sin A}$ (A ≠ 0)
20. What is the mode letter in the word "MATHEMATICS"?

Section – III

Note: 1. Answer all the following questions.

2. Each question carries 4 marks. **8 × 4 = 32 M**

21. Divide $3x^3 + x^2 + 2x + 5$ by $x^2 + 2x + 1$?
22. What is the value of $(\cot 36^0 . \tan 54^0) – (\text{cosec } 36^0 . \sec 54^0)$?
23. Find the L.C.M and H.C.F of 120 and 90 by prime factorization method?
24. If $\log\left(\frac{x+y}{2}\right) = \frac{1}{2}(\log x + \log y)$ then find the value of $\frac{x}{y} + \frac{y}{x}$?
25. Write the formula to find mode of grouped frequency distribution table and explain the variables in it?
26. Define (i) Mutually Exclusive Events (ii) Impossible Events and give example for each?

27. If α and β are the zeroes of the polynomial f(x) = x² - 5x + K such that α – β = 1. Find the value of 'k'?

28. If A = {a, b, c, d}, then how many subsets does A have? Write all?

Section – IV

Note: 1. Answer all questions

2. Each question carries 8 marks.

3. Each question has internal choice **5 × 8 = 40 M**

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

OR

A chord of a circle of radius 6 cm is making an angle 60^0 at the centre. Find the length of the chord?

30. Two dice, one red and one yellow, are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is (i) 8 (ii) 13 (iii) less than or equal to 12?

OR

Use Euclid's lemma to show that any positive dd integer is of the form 6q + 1 or 6q + 3 or 6q + 5, where 'q' is some integers.

31. A = {1, 2, 3, 4, 5, 6, 7, 8, 9. 10}, B= {1, 3, 5, 7, 9, 11, 13}, C = {2, 4, 6, 8, 10, 12, 14} and D = {2, 3, 5, 7, 11, 13, 17}. Then find (i) AUC (ii) B∩C (iii) A – D (iv) (A – B) U (B – A)?

OR

If zeroes of the polynomial $x^3 – 3x^2 + x + 1$ are a – b, a, a + b then find 'a' and 'b'?

32. If the median of the distribution given below is 28.5. Find the values of 'x' and 'y'?

C. I	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	Total
frequency	5	X	20	15	y	5	60

OR

On dividing $x^3 – 3x^2 + x + 2$ by a polynomial g(x), then quotient and remainder were (x – 2) and (-2x + 4) respectively. Find g(x).

33. Find the zeroes of the polynomial $x^2 + 2x – 3$?

OR

Convert the distribution in to more than type cumulative frequency distribution and draw its ogive curve.

Classes	1 – 4	4 – 7	7 – 10	10 – 13	13 – 16	16 – 19
Frequency	6	30	42	14	4	4