BRINDHAVAN HR.SEC.SCHOOL, SUKKIRANPATTI
SEPTEMBER MONTHLY TEST

SUBJECT: MATHS   **Mark: 100**

Std: 10   **Time: 3 hrs**

Part – A

Choose the correct Answer:-   **14x1=14**

1. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are   (A) 0, 1, 8   (B) 1, 4, 8   (C) 0, 1, 3   (D) 1, 3, 5

2. The sum of the exponents of the prime factors in the prime factorization of 420 is (A) 2 (B) 3 (C) 4 (D) 5

3. The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P.   (A) 4551   (B) 10091   (C) 7881   (D) 13531

4. Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that $a = bq + r$, where r must satisfy.
   $(A)\ 1 < r < b$ $(B)\ 0 < r < b$ $(C)\ 0 \le r < b$ $(D)\ 0 < r \le b$

5. If 6 times of 6th term of an A.P. is equal to 7 times the 7th term, then the 13th term of the A.P. is (A) 0 (B) 6 (C) 7 (D) 13

6. The 8th term of the sequence 1,1,2,3,5,8,…..   (A) 25   (B) 24   (C) 23   (D) 21

7. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is (A) 2025 (B) 5220 (C) 5025 (D) 2520

8. What is the HCF of the least prime and the least composite number? (A) 1 (B) 2 (C) 3 (D) 4

9. If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is (A) 4 (B) 2 (C) 1 (D) 3

10. The probability of sure event is (A) 1 (B) 2 (C) 0 (D) $\frac{1}{2}$

11. When three coins are tossed, the probability of getting the same face on all the three coins is (A) $\frac{7}{8}$ (B) $\frac{1}{4}$ (C) $\frac{3}{8}$ (D) $\frac{1}{3}$

12. Which of the following is incorrect?
    $(A)\ P(A) > 1$ $(B)\ 0 \le P(A) \le 1$ $(C)\ P(\emptyset) = 0$ $(D)\ P(A) + P(\overline{A}) = 1$

13. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is (A) 2 (B) 1 (C) 3 (D) 1.5

14. If a letter is chosen at random from the English alphabets $\{a, b, \dots, z\}$, then the probability that the letter chosen precedes x (A) $\frac{12}{13}$ (B) $\frac{1}{13}$ (C) $\frac{23}{26}$ (D) $\frac{3}{26}$

Part – B   **10x2=20**

i) Answer any 10 Questions.   ii) Question No 28 is Compulsory.

15. Find the quotient and remainder when a is divided by b in the following case $a = -12, b = 5$

16. If the Highest Common Factor of 210 and 55 is expressible in the form $55x - 325$, find x.

17. If $13824 = 2^a \times 3^b$ then find a and b.

18. The general term of a sequence is defined as
    $a_n = \begin{cases} n(n+3); n \in \mathbb{N} & is\ odd \\ n^2+1\ ; n \in \mathbb{N} & is\ even \end{cases}$ Find the eleventh and eighteenth terms.

19. Show that the square of an odd integer is of the form $4q + 1$, for some integer q.

20. Find the 19th term of an A.P. $-11, -15, -19, \dots$

21. Find the number of terms in the A.P. $3, 6, 9, 12, \dots, 111$.

22. If $3 + k, 18 - k, 51 + k$ are in A.P. then find k.

23. Find the first four terms of the sequences whose nth terms are given by $a_n = n^3 - 2$

24. Two coins are tossed together. What is the probability of getting different faces on the coins?

25. What is the probability that a leap year selected at random will contain 53 saturdays.

26. Write the sample space for tossing three coins using tree diagram.
27. A bag contains 5 blue balls and 4 green balls. A ball is drawn at random from the bag. Find the probability that the ball drawn is (i) blue (ii) not blue.
28. In a box there are 20 non-defective and some defective bulbs. If the probability that a bulb selected at random from the box found to be defective is $\frac{3}{8}$ then, find the number of defective bulbs.

<div align="center"><u>Part – B</u>   10x5=50</div>

Answer any 10 Questions. Question no 42 is compulsory.

29. Find the HCF of $396, 504, 636$.
30. Find the largest number which divides 1230 and 1926 leaving remainder 12 in each case.
31. Find the greatest number consisting of 6 digits which is exactly divisible by 24,15,36?
32. What is the smallest number that when divided by three numbers such as $35, 56$ and 91 leaves remainder 7 in each case?
33. If $a_1 = 1, a_2 = 1$ and $a_n = 2a_{n-1} + a_{n-2}, n \geq 3, n \in \mathbb{N}$, then find the first six terms of the sequence.
34. The ratio of 6th and 8th term of an A.P. is $7:9$. Find the ratio of 9th term to 13th term.
35. Find the 15th, 24th and n^{th} term (general term) of an A.P. given by $3, 15, 27, 39, ...$
36. The sum of three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.
37. A bag contains 12 blue balls and x red balls. If one ball is drawn at random (i) what is the probability that it will be a red ball? (ii) If 8 more red balls are put in the bag, and if the probability of drawing a red ball will be twice that of the probability in (i), then find x.
38. If A is an event of a random experiment such that $P(A) : P(\bar{A}) = 17:15$ and $n(S) = 640$ then find $(i)\ P(\bar{A})\ (ii)\ n(A)$.
39. Three fair coins are tossed together. Find the probability of getting
    (i) all heads   (ii) atleast one tail   (iii) atmost one head   (iv) atmost two tails
40. Two dice are rolled. Find the probability that the sum of outcomes is
    (i) equal to 4   (ii) greater than 10   (iii) less than 13
41. From a well shuffled pack of 52 cards, one card is drawn at random. Find the probability of getting (i) red card (ii) heart card   (iii) red king   (iv) face card (v) number card
42. If d is the Highest Common Factor of 32 and 60, find x and y satisfying $d = 32x + 60y$.

<div align="center"><u>Part – C</u>   2x8=16</div>

Answer the two Questions.

43.**a)** Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding sides of the triangle PQR (scale factor $\frac{3}{5}$ <1). **(OR)**

   b) Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of the triangle PQR (scale factor $\frac{7}{4}$ >1).

44. **a)** Construct a ΔPQR which the base $PQ = 4.5$ cm, $\angle R=35°$ and the median from R to RG is 6 cm.
<div align="center">(**OR**)</div>

   b) Construct a triangle ΔPQR such that $QR = 5$ cm, $\angle P=30°$ and the altitude from P to QR is of length 4.2 cm.   (**OR**)

   a) Discuss the nature of solutions of the following quadratic equation $x^2 + x - 12 = 0$
<div align="center">(**OR**)</div>

   b) Discuss the nature of solutions of the following quadratic equation $x^2 - 6x + 9 = 0$