Q.P. SET CODE
C

MT - y

Seat No. | | | | | | | |

2017 ___ ___ 1100 - MT - y - MATHEMATICS (71) ALGEBRA - SET - C (E)

Time : 2 Hours **(Pages 4)** **Max. Marks : 40**

Note :

(i) All questions are compulsory.

(ii) Use of calculator is not allowed.

Q.1. Solve ANY FIVE of the following : **5**

(i) Find the first five terms of the following sequence, whose 'n^{th}' term is given : $t_n = 2n - 5$.

(ii) Is the following a quadratic equation ?

$\frac{3}{y} - 4 = y$

(iii) Find the value of discriminant of the following equation :

$x^2 - 6x + 7 = 0$

(iv) Write D_x for the following simultaneous equation :

$5x = 10 - 2y$; $y = 3x - 11$

(v) If S = {1, 2, 3, 5, 7, 9, 11, 13, 15} and A = {1, 3, 7, 11, 15}, find P(A).

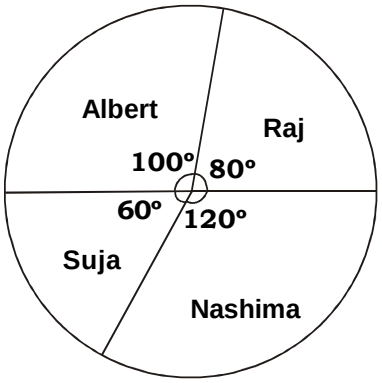
(vi) The classes are 13.1-14, 14.1-15, 15.1-16. Make the classes continuous.

Q.2. Solve ANY FOUR of the following : **8**

(i) Find the first three terms of the sequence for which S_n is given below : $S_n = n^2 (n + 1)$.

(ii) Find the value of k if x = 4 is the solution of the equation :
$3x^2 + kx - 2 = 0$

(iii) The following pie diagram represent the number of valid votes obtained by four students who contested for school captain. The total number of valid votes polled was 720.
Answer the following questions :
(a) Who has won the election ?
(b) What is the minimum number of votes? Who got it?



(iv) Without actually solving the simultaneous equations given below, decide which simultaneous equations have unique solution, no solution or infinitely many solutions :
$3x + 5y = 16$; $4x - y = 6$

(v) Two coins are tossed. Find the probability of the events :
(a) head appears on both the coins.
(b) head does not appear.

(vi) The 11^{th} term and the 21^{st} term of an A.P. are 16 and 29 respectively, find the 1^{st} term and the common difference.

Q.3. Solve ANY THREE of the following : **9**

(i) Find t_n for an Arithmetic Progression where $t_3 = 22$, $t_{17} = -20$.

(ii) Solve the following quadratic equation using formula :
$2x^2 + 5x - 2 = 0$

(iii) One card is drawn from a well- shuffled pack of 52 cards. Find the probability of getting (a) the jack of hearts (b) a spade (c) the queen of diamonds.

(iv) Electricity used by farmers during different parts of a day for irrigation is as follows. Draw pie diagram :

Part of day	Morning	Afternoon	Evening	Night
Percentage of electricity used	30	40	20	10

(v) Represent the following data using frequency curve :

Electricity bill in a month (in Rs.)	200 - 400	400-600	600 - 800	800 - 1000
No. of families	362	490	185	63

Q.4. Solve ANY TWO of the following : **8**

(i) Babubhai borrows Rs. 4000 and agrees to repay with a total interest of Rs. 500 in 10 instalments, each instalment being less than the preceding instalment by Rs. 10. What should be the first and the last instalment?

(ii) Solve the following simultaneous equations using graphical method : $3x + 4y + 5 = 0$; $y = x + 4$.

(iii) In the following experiment write the sample space S, number of sample points n (S), events P, Q, R using set and n (P), n (Q) and n (R).
Find complementary events, mutually exclusive events and exhaustive events.
There are 3 men and 2 women. A 'Gramswachaatta Abhiyan' committee of two is to be formed
P is the event that the committee should contain at least one woman.
Q is the event that the committee should contain one man and one woman.
R is the event that there is no woman in the committee.

Q.5. Solve ANY TWO of the following : **10**

(i) The product of four consecutive positive integers is 840. find the largest number.

(ii) Solve the following simultaneous equations :

$$\frac{16}{x+y} + \frac{2}{x-y} = 1; \quad \frac{8}{x+y} - \frac{12}{x-y} = 7$$

(iii) Below is given frequency distribution of dividend in percentage declared by 120 companies.

Dividend (in %)	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79
No. of companies	5	15	28	42	15	12	3

Obtain mean dividend declared by a company by step deviation method.

Best Of Luck 👍