Roll No.


Total No. of Pages : 02
Total No. of Questions : 09

# B.Sc. Agriculture (2014 \& Onwards) <br> MATHEMATICS - I <br> Subject Code: BSAG-106a <br> M.Code : 72213 

(Sem.-1)

## 

Max. Marks : 60

## INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

## SECTION-A

Q1. Answer briefly :
a) Find the centre and radius of

$$
x^{2}+y^{2}+6 x-4 y+4=0
$$

b) Find equation of circle whose radius is 5 and centre lies on x -axis and passes through point (2,3).
c) Determine x such that $\mathrm{m}=2$ and line passes $(2,5)$ and $(\mathrm{x}, 3)$
d) How many numbers of two digits are divisible by 9 ?
e) The sum of three numbers in G.P. is 38 and product is 1728 , find them.
f) Find the positive value of $m$ for which coefficient of $x^{2}$ in the expansion of $(1+x)^{\mathrm{m}}$ is 6 .
g) Write the number of ways 7 men and 7 women can sit on a round table such that no two women sit together.
h) If there are 12 persons in a party, and if each two of them, shake hands with each other, how many handshakes happen in the party?
i) How many numbers of two digits are divisible by 7 ?
j) The sum of four numbers in G.P. is 85 and product is 4096 , find them.

## SECTION-B

Q2. a) The altitude drawn to the base of an isosceles triangle is 8 cm and the perimeter is 32 cm . find the area of the triangle.
b) The length of a rectangle is twice its breadth. If its length is decreased by 5 cm and breadth is increased by 5 cm , the area of the rectangle is increased by $75 \mathrm{sq} . \mathrm{cm}$. find the length of the rectangle.

Q3. a) Find the length of the longest pole that can be placed in a room 12 m long, 3 m broad and 9 m high.
b) Two concentric circles form a ring. The inner and outer circumferences of the ring are $50 \frac{2}{7} \mathrm{~m}$ and $75 \frac{3}{7} \mathrm{~m}$ respectively. Find the width of the ring.

Q4. a) A cube of edge 15 cm is immersed completely in a rectangular vessel containing water. If the dimensions of the base of vessel are $20 \mathrm{~cm} \times 15 \mathrm{~cm}$, find the rise in water level.
b) A rectangular water tank is $80 \mathrm{~m} \times 40 \mathrm{~m}$. Water flows into it through a pipe $40 \mathrm{sq} . \mathrm{cm}$ at the opening at the speed of $10 \mathrm{~km} / \mathrm{hr}$. By how much height, the water level will rise in the tank in half an hour?

Q5. a) Solve the following quadratic equation by factorisation method $4 x+9=0$.
b) Solve the quadratic equation $17 x^{2}-8 x+1=0$ by using the general expressions for the roots of a quadratic equation.

Q6. a) How many words can be framed from the letters of word 'DIRECTOR' so that the vowels are always together?
b) In how many ways can a cricket eleven be chosen out of a batch of 15 players?

## SECTION-C

Q7. a) Expand $\left(1+x+x^{2}\right)^{3}$ using binomial theorem.
b) Find the sum of following series
$1+11+111+\ldots$ to $n$ terms.
Q8. a) Find the equation of a line that has $y$ intercept 4 and is perpendicular to the line joining $(2,-3)$ and $(4,2)$.
b) Find the equation of the line which makes an angle of $15^{\circ}$ with the positive direction of x - axis and which cuts an intercept of length 4 on the negative direction of y -axis.

Q9. a) Find the equation of circle which passes through 2 points on the $x$-axis which is at distances 4 from the origin and whose radius is 5 .
b) Find equation of the circle which passes through the origin and cuts off intercepts 3 and 4 from the positive parts of the axes respectively.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

