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**REGIONAL OFFICE VARANASI**

**SUMMATIVE ASSESSMENT – II (2015–16)**

**CLASS – IX**

**SUBJECT-MATHS**

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**Time Allowed –3 hr.**

**MAX.MARKS - 90**

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*General Instruction:*

**I - All questions are compulsory.**

**II –The question paper is divided in to five sections A , B , C , D and E.**

**III – Section E is OTBA.**

**IV – Use of calculator is not permitted.**

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**SECTION – A**

**Question number 1 to 4 carry 1 marks each.**

Q 1 The median of a triangle divides it in two right angled triangles. Justify your answer.

Q 2 The mode of the data 4, 4, 8, 10, 15, 20, 8, 17 and x is 4. Find the value of x.

Q 3 Find volume of hemisphere of diameter 6 r units.

Q 4 The following number of goals was scored by a team in a series of 10 matches:

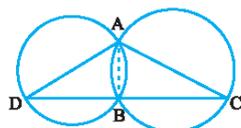
2, 3, 4, 5, 0, 1, 3, 3, 4, 3 . Find the mean

**SECTION – B**

**Question number 5 to 10 carry 2 marks each.**

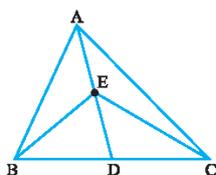
Q 5 Find the total surface area of a hemisphere of radius 10 cm. (Use  $\pi= 3.14$ )

Q 6 Two circles intersect at two points A and B. AD and AC are diameters to the two circles (see Fig). Prove that B lies on the line segment DC.



Q 7 Prove that equal chords of a circle subtends equal angle at the centre.

Q 8 In Fig., E is any point on median AD of a  $\Delta ABC$ . Show that  $\text{ar} (ABE) = \text{ar} (ACE)$ .



Q 9 Find the range of the following data: 70, 65, 71, 36, 55, 61, 62, 41, 40, 39, 35

Q 10 1500 families with 2 children were selected randomly, and the following data were recorded:

Number of girls in a family	2	1	0
Number of families	475	814	211

Compute the probability of a family, chosen at random, having  
(i) 2 girls (ii) 1 girl

### SECTION – C

**Question number 11 to 18 carry 3 marks each.**

Q 11 A cylindrical pillar is 50 cm in diameter and 3.5 m in height. Find the cost of painting the curved surface of the pillar at the rate of Rs 12.50 per  $m^2$ .

Q 12 P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD. Show that ar (APB) = ar (BQC).

Q 13 Prove that if two triangles on the same base (or equal base) and between the same parallels are equal in area

Q 14 Construct a triangle ABC in which  $BC = 7\text{cm}$ ,  $\angle B = 75^\circ$  and  $AB + AC = 13\text{ cm}$ .

Q 15 Three coins are tossed simultaneously 200 times with the following frequencies of Different outcomes:

Outcome	3 heads	2 heads	1 head	No head
Frequency	23	72	77	28

If the three coins are simultaneously tossed again, compute the probability of 2 heads coming up.

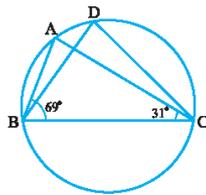
Q 16 D, E and F are respectively the mid-points of the sides BC, CA and AB of a  $\Delta ABC$ . Show that

(i) BDEF is a parallelogram.

(ii)  $\text{ar}(\text{DEF}) = \frac{1}{4} \text{ar}(\text{ABC})$

(iii)  $\text{ar}(\text{BDEF}) = \frac{1}{2} \text{ar}(\text{ABC})$

Q 17 In Fig.  $\angle ABC = 69^\circ$ ,  $\angle ACB = 31^\circ$ , find  $\angle BDC$ .



Q 18 Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardised conditions favourable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follow

Bag	1	2	3	4	5
Number of seeds germinated	40	48	42	39	41

What is the probability of germination of

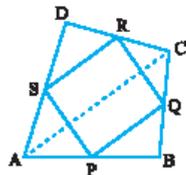
- more than 40 seeds in a bag?
- 49 seeds in a bag?
- more than 35 seeds in a bag?

### SECTION - D

**Question number 19 to 28 carry 4 marks each.**

Q 19 A godown measures  $40\text{ m} \times 25\text{ m} \times 10\text{ m}$ . Find the maximum number of wooden crates each measuring  $1.5\text{ m} \times 1.25\text{ m} \times 0.5\text{ m}$  that can be stored in the godown.

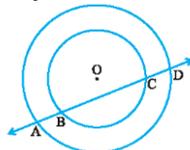
Q 20 ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA (see Fig). AC is a diagonal. Show that:



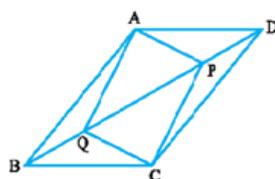
- $SR \parallel AC$  and  $SR = \frac{1}{2}AC$
- $PQ = SR$
- PQRS is a parallelogram.

Q 21 Construct a triangle XYZ in which  $\angle Y = 30^\circ$ ,  $\angle Z = 90^\circ$  and  $XY + YZ + ZX = 11\text{ cm}$ .

Q 22 If a line intersects two concentric circles (circles with the same centre) with centre O at A, B, C and D, prove that  $AB = CD$  (see Fig.)



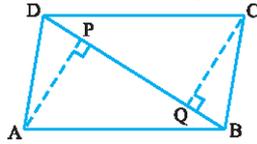
Q 23 In parallelogram ABCD, two points P and Q are taken on diagonal BD such that  $DP = BQ$  (see Fig.). Show that:



- (i)  $\triangle APD \cong \triangle CQB$
- (ii)  $AP = CQ$
- (iii)  $\triangle AQB \cong \triangle CPD$
- (iv)  $AQ = CP$
- (iv)  $APCQ$  is a parallelogram

OR

ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD (see Fig). Show that



- (i)  $\triangle APB \cong \triangle CQD$
- (ii)  $AP = CQ$

- Q 24 A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litres of water can it hold? ( $1 m^3 = 1000 l$ )
- Q 25 If the volume of a right circular cone of height 9 cm is  $48 \pi cm^3$ , find the diameter of its base.
- Q 26 A cancer detective centre is going to develop in a city of cubical shape having length 600 m, breadth 500 m and height 400 m.
- (a) Calculate its total area.
  - (b) What concept is derived from this activity?
- Q 27 A random survey of the number of children of various age groups playing in a park was found as follows:

Age (in years)	Number of children
1-2	5
2-3	3
3-5	6
5-7	12
7-10	9
10-15	10
15-17	4

Draw a histogram to represent the data above

- Q 28 Find the mean salary of 60 workers of a factory from the following table:

Salary (in Rs)	Number of workers
3000	16
4000	12
5000	10
6000	8
7000	6
8000	4
9000	3
10000	1
<b>Total</b>	<b>60</b>

### SECTION – E

**Question number 29 to 30 carry 5 marks each.**

- Q 29 Ashok wants to burn 200 calories in a day by walking and running stairs ,he plans to spend “w” hours in walking and “s” hours in running stairs. Write a linear equation for it and draw the graph.
- Q30 Body mass index (BMI) is a person’s weight in kilograms divided by the square of height in meters.Taking the height as 180 cm.form a linear equation in two variables taking BMI as x and weight as y kg.Also draw graph