SUMMATIVE ASSESSMENT – II, 2016-17
MATHEMATICS
Class – IX

Time Allowed : 3 hours   **Maximum Marks: 90**

General Instructions:
1.   All questions are **compulsory**.
2.   The question paper consists of **31** questions divided into **four sections A, B, C and D**. **Section-A** comprises of **4** questions of **1 mark** each; **Section-B** comprises of **6** questions of **2 marks** each; **Section-C** comprises of **10** questions of **3 marks** each and **Section-D** comprises of **11** questions of **4 marks** each.
3.   There is no overall choice in this question paper.
4.   Use of calculator is not permitted.

SECTION-A

Question numbers 1 to 4 carry one mark each.

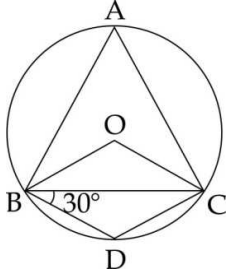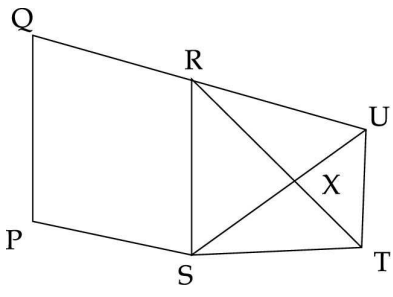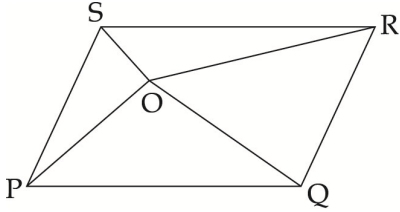|		
1	Construct an obtuse angle and draw its bisector.	1
2	Find the number of small cubes with edge 20 cm that can be accommodated in a cubical box of 2 meter edge.	1
3	$x = 0$ is the equation of which axis?	1
4	Express $y + 3 = 0$, in the form of $ax + by + c = 0$.	1

SECTION-B

Question numbers 5 to 10 carry two marks each.

5	In the given figure, ABC is a triangle in which $\angle BAC = 30°$. Show that BC is equal to the radius of the circumcircle of $\triangle ABC$ whose centre is O.	2
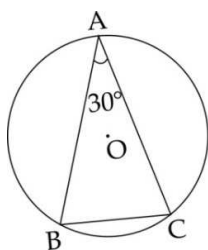
6	A die is thrown 50 times and it showed the number 1, 23 times. Find the probability of getting a number other than 1 in the next throw of the die.	2
7	The curved surface area of a cone is 12320 sq cm. If the radius of its base is 56 cm, find its height.	2

8	In the given figure, O is the centre of the circle. If BD=DC and ∠DBC=30°, find the measures of ∠BAC and ∠BOC. 	2
9	Eleven bags of wheat flour contain the following weights of flour (in kg): 4.97, 5.05, 5.08, 5.03, 5.00, 5.06, 5.08, 5.07, 5.04, 5.00, 4.98. Find the probability that any one of these bags chosen at random contains more than 5 kg of flour.	2
10	PQRS is a parallelogram with diagonals PR and QS intersecting at a point E. If ar (ΔSEP) + ar (ΔQER) = 12 cm², find area of parallelogram PQRS.	2
	SECTION-C	
	Question numbers 11 to 20 carry three marks each.	
11	PQRTS is a pentagon. A line through T meets QR produced in U such that SR ∥ UT. Show that ar (PSUQ) =ar (PQRTS). 	3
12	Draw a line segment PQ of length 8 cm. Draw $\dfrac{1}{4}$ PQ, using compass and ruler.	3
13	In $2x + y = 13$, express y in terms of x. Also find three solutions of the above equation and draw its graph.	3
14	The median of the following observations arranged in ascending order is 24. Find x. 14, 18 $x+2$, $x+4$, 30, 34 Using the value of x, find the mean of the above data.	3
15	If $x=-1$, $y=3$ is a solution of the linear equation $3ax+4ay=9$ then find value of a For this value of a, determine value of b from the equation $(2b+1)-3(a+2)+4=0$.	3

16	Prove that the diameter of a circle that bisects a chord also bisects the angle subtended by the chord at the centre of the circle.	3
17	Convert the following frequency distribution into a continuous grouped frequency table :	3

Class - Interval	Frequency
150 - 153	7
154 - 157	7
158 - 161	15
162 - 165	10
166 - 169	5
170 - 173	6

In which intervals would 153.5 and 166.5 be included ?

18	If the total surface area of solid sphere is 98.56 cm^2, then find the radius of the sphere.	3

SECTION-D

Question numbers 21 to 31 carry four marks each.

19	Prove that the angle subtended by an arc of a circle at the centre is double the angle subtended by it at any point on the remaining part of the circle.	4
20	Two types of water tankers are available in shop. One is m cubical form of 2 m $\times$ 2 m $\times$ 2 m and the other is in cylindrical form of radius 2 m and height 1 m. The shopkeeper advised to take cylindrical tank for donation. (a) Calculate the volumes of both containers. (b) Which value is depicted by shopkeeper ?	4
21	Construct a $\triangle$ ABC in which BC $=$ 7 cm, $\angle$B $=$ 60° and AC $-$ AB $=$ 2.4 cm.	4
22	A pair of opposite angles of a parallelogram are $40x$ and $50y$. Write a linear equation which satisfies this data. Also draw the graph for the same.	4
23	Draw the graphs of the following equations on the same graph sheet : $x = 4, x = 2, y = 1, y - 3 = 0$. Also, find the area enclosed between these lines.	4
24	In the given figure, O is any point in the interior of parallelogram PQRS. Prove that ar ($\triangle$POQ) $+$ ar($\triangle$SOR) $=$ ar ($\triangle$POS) $+$ ar ($\triangle$QOR) $= \dfrac{1}{2}$ [ar ($\parallel$gm PQRS)]. 	4

25	A recent survey found that the ages of workers in a factory is distributed as follows :	4

Age (in years)	14 - 23	24 - 33	34 - 43	44 - 53	54 and more
No. of Workers	38	27	86	46	3

If a worker is selected at random, find the probability that the age of the worker is :

(i)   44 years or more.

(ii)   upto 43 years.

(iii)   in age group of 34-53 years.

(iv)   under 54 but more than or equal to 34 years

		4
26	A hollow cylindrical iron pipe is 21 m long. Its outer and inner diameters are 10 cm and 6 cm respectively. Find the volume of the iron used in making the pipe. Also find the outer surface area of pipe.	4
27	The marks out of 100 of 80 students of a class are given below. Construct a histogram to represent the data.	4

Marks	10-20	20-30	30-50	50-70	70-100
No of students	7	15	18	20	10

| 28	Water is supplied to a city population from a river through a cylindrical pipe. The diameter of the cross section of pipe is 20 cm, the speed of water through the pipe is 18 km per hour. Find the quantity of water in litres which is supplied to the city in 4 hours.	4

SECTION-E (Open Text)

(* Please ensure that open text of the given theme is supplied with this question paper.)
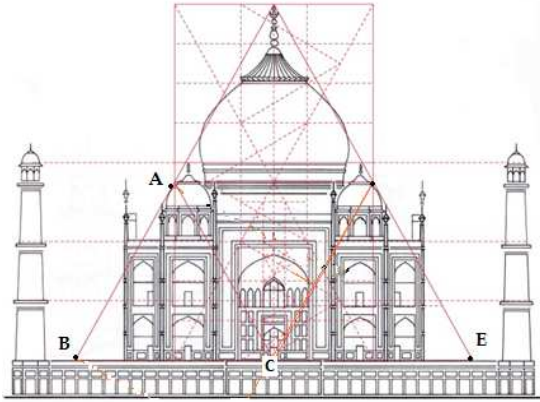**Theme : Quadrilateral in Architecture, WAH TAJ.**

29		3
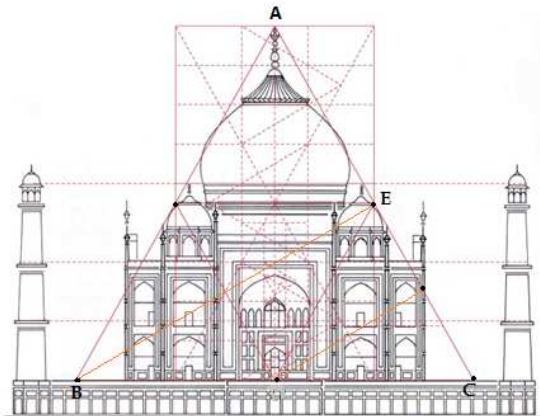
In ΔABC (see figure), mid-point of side AC is E. If ∠EBC: ∠BCE: ∠CEB=2:3:5, then find all the angles of ΔBCE.
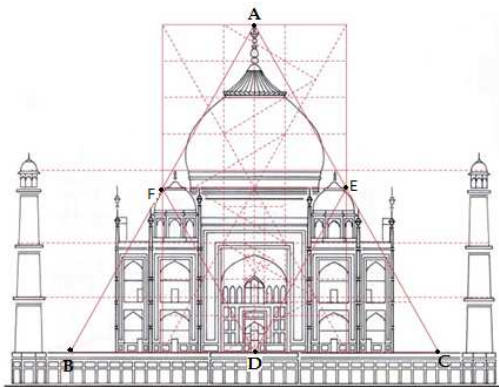
30	Prove that if in a parallelogram ABCD (see figure) diagonal AC bisects ∠A, then	3
	(i) it also bisects ∠C.	
	(ii) ABCD is a rhombus.	
31	Show that in the given figure of triangle ABC, if mid-points of sides AB, BC and AC are joined, then triangle is divided into four congruent triangles.	4

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