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BOARD OF SECONDARY EXAMINATION

Sample Paper-1 (Issued by BSER Ajmer)

SECTION-A

Q.1. Find the H.C.F. of numbers 48 and 105. [Ans. H.C.F. = 3]

Q.2 For what values of p, the following system of equations have a unique solution?

$4x + py + 8 = 0; 2x + 2y + 2 = 0$ [Ans. $p \neq 4$]

Q.3 For what value of m the numbers 10, m, –2 is an A.P. [Ans. m = 4]

Q.4 Find the mid point of the line segment. Joining the points (6, 8) and (2, 4).

[Ans. 4, 6]

Q.5 Length of one line segment is 10 unit. If co-ordinaries of one point is (2, –3) and abscissa of other side is 10, find ordinate. [Ans. y = 3]

Q.6 How many tangent can be drawn at a point on the circle.

Q.7 If tangent PA and PB from a point P to a circle with centre O ore inclined to each other at the angle of 80°, then write values of $\angle AOB$. [Ans. 100°]

Q.8 Write the length of are of angle θ° of a circle with radius r.

Q.9 A die is thrown once then what is the probability of getting a prime number. [Ans. ½]

Q.10 Write down the sum of the probabilities of all the elementary events of an experiment.

SECTION-B

Q.11 The area of two similar triangles ΔABC and ΔDEF are 64 cm^2 and 121 cm^2 respectively. If EF = 15.4 cm. Find BC. [Ans. 11.2 cm]

Q.12 Prove that the length of tangents drawn from an external point to the circle are equal.

Q.13 In a circle of radius 6 cm, an are subtends an angle 60° at the centre. Find the area of the corresponding sector. [Ans.18.34 cm^2]

Q.14 The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has circumference equal to the sum of the circumference of the two circle.

[Ans. 28 cm]

Q.15 One card is drawn from a well shuffled pack of 52 cards. Find the probability that the card will be ace. [Ans. 1/13]

SECTION-C

Q.16 Show that $3\sqrt{2}$ is irrational.

Q.17 Divide $3x^2 - x^3 - 3x + 5$ by $x - 1 - x^2$ and verify the division algorithm.

Q.18 Find the root of equation— $2 - \frac{1}{x} = 3,\ x \neq 0$ [Ans. $\frac{3 \pm \sqrt{13}}{2}$]

Q.19 The difference of square of two number is 180. The square of the smaller number is 8 times the larger number. Find the two numbers. [Ans. 18 and 12]

Q.20 Find the sum of AP, 2, 7, 12 ….. to 10 terms. [Ans. 245]

Q.21 Write the coordinates of the point which divides the line segment joining the points (–1, 7) and (4, –3) in 2 : 3 internally. [Ans. 1, 3]

Q.22 Find the arc of the triangle whose vertices area A(5, 2), B(4, 7) and C(7, –4).

[Ans. 2 sq. unit]

Q.23 Find the value of $2\tan^2 45° + \cos^2 30° - \sin^2 60°$. [Ans. 2]

Q.24 The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 30°. Find the height of the tower. [Ans. $10\sqrt{3}$ m]

Q.25 Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

SECTION-D

Q.26 Solve the following system of linear equations graphically:- x + 3y = 6; 2x – 3y = 12

[Ans. 6, 0]

Q.27 Prove, in a right triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Q.28 Prove that $(\sin A + \text{cosec } a)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.

OR

Q.28 $\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{\sin^2 A - \cos^2 A}$

Q.29 The radii of the ends of a frustum of a cone 45 cm high are 28 cm and 7 cm. Find its volume.

Q.30 Marks of class 10 obtained by 100 student in a given. Find mode.

Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
No. of Students	7	21	34	46	66	77	92	100

OR

Q.30 Find the median of the following data-

Monthly consumption (in units)	65-85	85-105	105-125	125-145	145-165	165-185	185-205
No. of Consumers	4	5	13	20	14	8	4

Sample Paper-1

(Pattern of Secondary Education Board)

SECTION-A

Q.1 Find the L.C.M. of numbers 336 and 54. [Ans. 3024]

Q.2 Write the solution of the pair linear equation $x + y = 5$ and $2x - 3y = 4$.

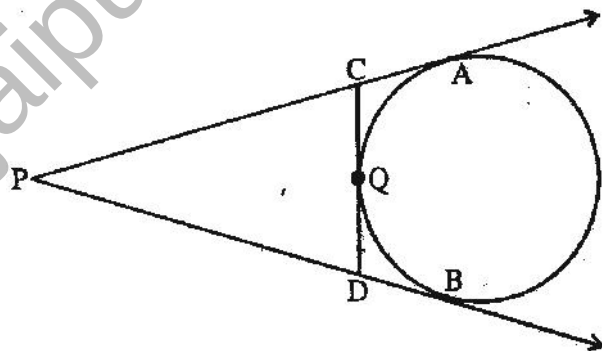
[Ans. $x = \frac{19}{5}$, $y = \frac{6}{5}$]

Q.3 Find the sum of AP : 2, 7, 12, ….. 10 terms. [Ans. –245]

Q.4 Write the distance of the point (–3, 7) from y-axis.

Q.5 Find the value of x such that PQ = QR where the coordinates P, Q and R are (6, –1), (1, 3) and (x, 8) respectively. [Ans. x = –3]

Q.6 In the given figure PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If PB = 10 cm and CQ = 2 cm, what is the length of PC? [Ans. 8 cm]



Q.7 What is relation between the length of the two tangents from an external point to a circle.

Q.8 Write the arc of a sector of a circle whose length of an arc is l with r. [Ans. $\frac{1}{2} \times l \times r$]

Q.9 One cord is drawn from a well shuffled. Pack of 52 cards. Find the probability that the card will not be ace. [Ans. $\frac{12}{13}$]

Q.10 In simultaneously toss of two coins, what is the probability of two talls? [Ans. $\frac{1}{4}$]

SECTION-B

Q.11 In a ΔABC, If $\angle A=90°$ and $AD \perp BC$. Prove that $AD^2 = BD \times DC$.

Q.12 Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle. [Ans. 8 cm]

Q.13 Find the area of the sector with radius 4 cm and of a angle 30°. Also find the area of the corresponding major sector. [Ans. 46.05 cm^2]

Q.14 A horse is placed for grazing inside a rectangular field 70 m. by 52 m and is tethered to one corner by a rope 21 m. long. On how much area can it graze? [Ans. 346.5 sq.m]

Q.15 A die is thrown once. Find the probability of getting–

(i) a prime number [Ans. $\frac{1}{2}$]

(ii) a number laying between 3 and 6 [Ans. $\frac{1}{3}$]

(iii) an odd number. [Ans. $\frac{1}{2}$]

SECTION-C

Q.16 Show that $3\sqrt{2}$ is irrational.

Q.17 Find the quotient and the reminder. When $3x^4 + 5x^3 - 7x^2 + 2x + 2$ is divided by $x^2 + 3x + 1$? [Ans. Remainder = 0]

Q.18 Find the sum of the first 21 terms of the A.P. whose 2nd term is 8 and 4th term is 14.

Q.19 Find two numbers whose sum is 27 and product is 182. [Ans. 13 and 14]

Q.20 Find the root and nature of the quadratic equation $2x^2 - 7x + 3 = 0$ by method of completing the square.

Q.21 Find the top of a building 100 m high, the angles of depression of the top and bottom of a tower are observed to be 45° and 60° respectively. Find the height of the tower. Also find the distance between the foot of the building and the bottom of the tower.

Q.22 Draw a right triangle in which the sides (other than hypotenuse) are of length 4 cm and 3 cm. Then construct another triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the given triangle.

Q.23 Check whether (5, –2), (6, 4) and (7, –2) are the vertices of an isosceles triangle.

Q.24 Find the ratio in which segment joining the points (–3, 10) and (6, –8) is divided by (–1, 6). [Ans. 2 : 7]

Q.25 If sin 3A = cos (A – 26°), where 3A is an acute angle, find the value of A. [Ans. A=29°]

SECTION-D

Q.26 Draw the graph of the liner equations $4x - y = 4$ and $3x + 2y = 14$. Determine the coordinates of the vertices of the triangle formed by these lines and the y axis and shade the triangular region.

Q.27 In ΔABC, if AD is median, show that $AB^2 + AC^2 = 2(AD^2 + BD^2)$

Q.28 Prove that $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \tan\theta + \cot\theta$

OR

Q.28 Prove that $\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A} = \sin A + \cos A.$

Q.29 A tent is the form of a cylinder of diameter 4.2 m and height 4 m, surrounding by a cone of equal base and height 2.8 m. Find the capacity of the tent and the cost of canvas for making the tent cost of canvas form making the tent of Rs. 100 per sq. m.

[Ans. Rs. 7,590]

Q.30 The mean of the following frequency distribution is 62.8. Find the missing frequency x.

Class	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	5	8	X	12	7	8

OR

Q.30 The following distribution given the state-wise teacher-student ratio in higher secondary schools of India. Find mode of this date.

No. of students per teacher	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No of state/U.T.	3	8	9	10	3	0	0	2