Question Bank (G scheme)

Name of subject: Basic Mathematics **Unit Test :II**
Subject code: 22103 **Course : CH/CM/EJ/IE/IF/IS/ME**
Semester: I

Chapter 1 (TRIGONOMETRY)

3 marks-

1) If sin A = 0.4, find sin 3A.
2) Prove that $\sin 2\theta = 2\ sin\theta\ cos\theta$
3) Without using calculator find the value of $\frac{\tan 66^0+\tan 69^0}{1-\tan 66^0 \tan 69^0}$
4) Find x if $\sin^{-1}(\frac{3}{5}) = \tan^{-1} x$
5) Prove that $\tan^{-1} x + \tan^{-1} y = \tan^{-1}\left[\frac{x+y}{1-xy}\right]$
6) Express as product and evaluate without using calculator: $\sin 99^0 - \sin 81^0$

4 marks-

1) Prove that $\frac{\sin 7x + \sin x}{\cos 5x - \cos 3x} = \sin 2x - \cos 2x \,.\cot x$
2) Prove that $\tan^{-1}(\frac{3}{4}) + \tan^{-1}(\frac{3}{5}) - \tan^{-1}\left(\frac{8}{19}\right) = \frac{\pi}{4}$
3) In Δ ABC, Prove that tan A + tan B + tan C = tan A.tan B.tan C
4) Prove that sin 3A = 3 sin A – 4 $\sin^3$ A
5) Without using calculator Prove that tan tan70^0 – tan 50^0 – tan 20^0 = tan 70^0 .tan 50^0 . tan 20^0
6) Without using calculator Prove that $\frac{\sin 19 +\cos 11}{\cos 19-\cos 11} = \sqrt{3}$
7) Prove that $\frac{\cos 3A}{\cos A} + \frac{\sin 3A}{\sin A} = 4\cos 2A$
8) Prove that $\tan^{-1}(1) + \tan^{-1}(2) + \tan^{-1}(3) = \pi$

Chapter- 2(STRAIGHT LINE)

3 marks:

1) Find the distance between the point (-2, 3) and the line 3x + 2y + 26 = 0
2) Find the distance between two parallel lines
   3x + 2y – 6 = 0 and 6x + 4y – 8 = 0
3) Find the equation of straight line whose y – intercept is 4 units and inclination is equal to 150^0.

4) Find the equation of line passing through the point (2, 5) and parallel to the line $6x + 2y = 12$

4 marks:

5) Find the equation of line passing through the point of intersection of the lines $2x + 3y = 13$ and $5x – y = 7$ and perpendicular to the line $3x – y + 17 = 0$
6) Find the equation of the line passing through the point of intersection of the lines $4x + 3y = 8$, $x + y = 1$ and parallel to the line $5x – 7y = 3$.
7) Find the acute angle between the lines $y = 5 + 6$ and $y = x$.
8) Find the equation of a line passing through the points (6, -4) and (-3, 8). Also find its slope and intercepts.
9) A line intersects the x-axis at A and y-axis at B. If the midpoint of seg AB is (3, 4), find its equation.
10) Find the equation of the line which passes through (4, 3) having equal intercepts.
11) Find the equation of the perpendicular bisector of the line joining the points (4, 8) and (-2, 6).

Chapter 3 (Mensuration)

3 marks-

1) If the diagonals of a rhombus are 16 cm and 12 cm, find its area.
2) The diameter of a wheel is 28 cm. It rolls through a distance of 22 meters, How many revolutions will it make?
3) Find the length of the longest pole that can be placed in a room 12 m long, 9 m broad and 8 m high.
4) The volume of sphere is (88/21) cubic meters, Find its surface area.

4 marks-

1) The area of a rectangular courtyard is 3000 sq. m. Its sides are in the ratio 6 : 5. Find the perimeter of the courtyard.
2) Four equal circles of radius 3.5 cm are cut-out from a metal plate 14 cm X 14 cm. Find the area of the remaining portion of the plate.

3) A metal strip having sides 11 X 7 X 5 cm is melted down and minted into coins each of diameter 1.4 cm and thickness 0.008 cm. Assuming no wastage, how many coins can be minted?
4) A bucket is in the shape of a frustum of a cone whose radii of the top and the bottom are 15 cm and 10 cm respectively. If the depth of the bucket is 21 cm, calculate its capacity in liters.

Chapter 4 (Statistics)

3 marks-

1) Find the coefficient of range : 40, 52, 47, 28, 45, 36, 47, 50.
2) Calculate mean deviation about the mean of the followings :
   1, 2, 3, 4, 5, 6, 7, 8, 9
3) Calculate standard deviation about the mean of the followings :
   15, 22, 27, 11, 9, 21, 14, 9

4 marks-

1) Calculate mean deviation about the mean of the followings :

Marks	0 - 10	10 - 20	20 - 30	30 – 40	40 - 50
No. of Students	5	8	15	16	6

2) Find mean deviation about the median of the followings :

Weight in gms	10 - 15	15 - 20	20 - 25	25 – 30	30 – 35	35 - 40	40 - 45
No. of items	7	12	16	25	19	15	6

3) FindStandard deviation about the median of the followings :

Weekly expenditure below Rs.	5	10	15	20	25
No. of Students	6	16	28	38	46

4) In two factories A and B, engaged in the same area of the industry, the average weekly wages (in Rs.) and the S. D. are as below:

Factory	**Average wages**	**S. D.**
A	34.5	5.0
B	28.5	4.5