

SEMESTER-ONE

MATHEMATICS

Grade-12

Sample Paper-1

Max. Marks: 50

Time Allowed: 90 minutes

General Instructions:

- (i) This question paper consists of 40 questions in 4 sections.
- (ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- (iii) Section A consists of 10 Multiple Choice Questions carrying 1 mark each.
- (iv) Section B consists of 10 Fill in the Blank Type Questions carrying 1 mark each.
- (v) Section C consists of 10 True or False Type Questions carrying 1 mark each.
- (vi) Section D consists of 10 Very Short Answer Questions carrying 2 mark each.

Section A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 10.

- 1.** If $\log_{\sqrt{5}} x + \log_{5^{1/3}} x + \log_{5^{1/4}} x + \dots$ up to 7 terms = 35, then x is equal to
- | | |
|---------|-------------------|
| (a) 5 | (b) 25 |
| (c) 125 | (d) None of these |

2. A GP consists of an even number of terms. If the sum of all the terms is 5 times the sum of the terms occupying odd places, then the common ratio is
- (a) 2 (b) 3
(c) 4 (d) 5
3. The standard deviation of some temperature data in °C is 5. If the data were converted into °F, the variance would be
- (a) 81 (b) 57
(c) 36 (d) 25
4. The mean deviation of the data 3, 10, 10, 4, 7, 10, 5 from the mean is
- (a) 2 (b) 2.57
(c) 3 (d) 3.75
5. If $\operatorname{cosec} A + \cot A = 11/2$, then $\tan A$ is equal to
- (a) $21/22$ (b) $15/16$
(c) $44/117$ (d) $117/43$
6. Which is a true statement?
- (a) The sum of an irrational number and a rational number is a rational number
(b) Red Fort is in Delhi
(c) What is your opinion about modern movies?
(d) Every quadrilateral is equiangular
7. The surface area of a cuboid of length l , breadth b and height h is
- (a) lbh (b) $lb + bh + hl$
(c) $2(lb + bh + hl)$ (d) $2(l + b)h$
8. What does a couple produce in rigid motion?
- (a) Pure rotation (b) Pure translation
(c) Rotation and translation (d) No motion
9. If 91% of A is 39% of B, and B is $x\%$ of A, then the value of x is:
- (a) $\frac{200}{3}$ (b) $\frac{700}{3}$
(c) $\frac{400}{3}$ (d) $\frac{500}{3}$

10. With the help of ruler and compasses, which of the following is not possible to construct?
- (a) 70° (b) 60°
(c) 135° (d) 160°

Section B

Fill in the blanks with a suitable word for each of the questions 11 – 20.

11. If the first term of a G.P. is 20 and the common ratio is 4. Find the 5th term _____.
12. The number 2048 is which term in the following Geometric sequence 2, 8, 32, 128, _____.
13. We use ball bearings and roller bearings to _____ friction.
14. The standard deviation is _____ to the mean deviation taken from the arithmetic mean.
15. If Mode – Mean = 36, Median – Mean = _____.
16. If 30% of x is 150, then x is _____.
17. The distance between any two given point of a rigid body _____ in time regardless of external forces exerted on it.
18. If x and y are complementary angles, then _____.
19. A quadratic and linear system can be represented by a line and a parabola in the _____.
20. If the mode of 12, 16, 19, 16, x , 12, 19, 12 is 16, then find the value of x _____.

Section C

State whether the following statements are true or false for each of the questions 21–30.

21. Find the common ratio for the sequence 1, 2, 4, 8, ... $\rightarrow 2$.
22. List the next 3 terms of the geometric sequence
 $\frac{1}{2}, \frac{3}{2}, \frac{9}{2}, \dots \rightarrow \frac{27}{2}, \frac{81}{2}, \frac{243}{2}$
23. Bearings are designed to help the relieve friction and control mechanical motion.
24. It is difficult to carry on construction work in plains.
25. The frictional forces acts in the direction of motion of the body.

26. Plains are useful because they are rich in mineral deposits.
27. Percentages can be expressed as proportions.
28. If the perimeter of an isosceles triangle is 11 cm and its base is 5 cm, its area is $\frac{5}{4}\sqrt{11}$ cm².
29. Two cuboids with equal volume will always have equal surface area.
30. Every fraction is a rational number.

Section D

Answer each of the questions 31 – 40.

31. Find the 10th and n th term of the sequence 4, 9, 14, 19,
32. If the bearing of Y from X is 120° , find the bearing of X from Y.
33. Construct a quadrilateral ABCD such that AB = 2.2 cm, BC = 3.8 cm, CD = 4.9 cm, AD = 2.1 cm and $\angle A = 45^\circ$.
34. A Senior Football Club in Liberia has thirty members. Their ages are given below. Make a frequency distribution table for it.
13, 17, 13, 13, 14, 15, 15, 14, 16, 14, 16, 17, 16, 16, 13, 15, 16, 15, 15, 14, 14, 15, 15, 13, 13, 15, 14, 13, 16, 17.
35. A Senior Football Club in Liberia has thirty members. Their ages are given below. Make a frequency distribution table for it.
36. Find the M.D. from A.M. for the following data:
- | | | | | | | |
|-----|---|---|----|----|----|----|
| x | 4 | 6 | 8 | 11 | 13 | 15 |
| f | 6 | 9 | 12 | 7 | 7 | 4 |
37. Solve the factorization $2x^2 - 36 = 0$.
38. The height of a cone is 20 cm and its base radius is 16 cm. Find the curved surface area and the total surface area of the cone. (Use $\pi = 3.14$).
39. The height of a cone is 20 cm and its base radius is 16 cm. Find the curved surface area and the total surface area of the cone. (Use $\pi = 3.14$).
40. Sentences involving variable time such as ‘today’ ‘tomorrow’ or ‘yesterday’ are not statements. “Tomorrow is Wednesday”.