## ACE OF PACE – SAMPLE PAPER
ENGINEERING
Grade X moving to XI

Section – I

1. The area of the triangle whose vertices are A(1, 2), B(–2, 3) and C(–3, –4) is
   (A) 11   (B) 22   (C) 33   (D) 21

2. The line segment joining the points (3, –1) and (–6, 5) is trisected. The coordinates of a point of trisection is
   (A) (3, 3)   (B) (–3, 3)   (C) (3, –2)   (D) (–3, 3)

3. From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR to the circle are drawn. Then the area of the quadrilateral PQOR is
   (A) $60\,cm^2$ (B) $65\,cm^2$ (C) $30\,cm^2$ (D) $32.5\,cm^2$

4. If angle between two tangents drawn from a point P to a circle of radius 'a' and centre 'O' is 90°, then OP =
   (A) $2a\sqrt{2}$ (B) $a\sqrt{2}$ (C) $\dfrac{a}{\sqrt{2}}$ (D) $5a\sqrt{2}$

5. In the figure, PQL and PRM are tangents to the circle with centre O at the points Q and R, respectively and S is a point on the circle such that $\angle SQL = 50°$ and $\angle SRM = 60°$. Then $\angle QSR$ is equal to
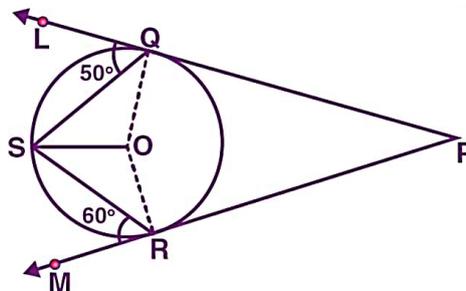
   (A) 40°   (B) 60°   (C) 70°   (D) 80°

6. The centres of the seven circles shown all lie on the same line. The four smaller circles have radius 1 cm. The circles touch, as shown. What is the total area of the shaded regions?
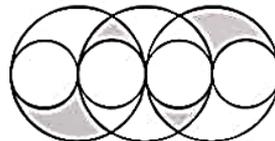
   (A) $\pi\,cm^2$ (B) $2\pi\,cm^2$ (C) $3\pi\,cm^2$ (D) $4\pi\,cm^2$

7. In triangles ABC and DEF, $\angle B = \angle E$, $\angle F = \angle C$ and AB = 3DE. Then, the two triangles are
   (A) congruent but not similar   (B) similar but not congruent
   (C) neither congruent nor similar   (D) congruent as well as similar

8. If the mean of frequency distribution is 7.5 and $\sum f_i x_i = 120 + 3k$, $\sum f_i = 30$, then k is equal to:
   (A) 40   (B) 35   (C) 50   (D) 45

9. In $\triangle ABC$, right-angled at B, AB = 24 cm, BC = 7 cm. The value of tan C is:

   (A) $\dfrac{12}{7}$　　　　(B) $\dfrac{24}{7}$　　　　(C) $\dfrac{20}{7}$　　　　(D) $\dfrac{7}{24}$

10. $\left(\sin 30° + \cos 60°\right) - \left(\sin 60° + \cos 30°\right)$ is equal to

    (A) 0　　　　(B) $1 + 2\sqrt{3}$　　　　(C) $1 - \sqrt{3}$　　　　(D) $1 + \sqrt{3}$

11. If $\triangle ABC$ is right angled at C, then the value of $\cos(A+B)$ is

    (A) 0　　　　(B) 1　　　　(C) $\dfrac{1}{2}$　　　　(D) $\dfrac{\sqrt{3}}{2}$

12. The value of $\left(\tan 1° \tan 2° \tan 3° .... \tan 89°\right)$ is

    (A) 0　　　　(B) 1　　　　(C) 2　　　　(D) $\dfrac{1}{2}$

13. The value of the expression $\sin^6\theta + \cos^6\theta + 3\sin^2\theta\cos^2\theta$ is
    (A) 0　　　　(B) 3　　　　(C) 2　　　　(D) 1

14. What will be the value of x, if $5^{(x+3)} = 25^{(3x-4)}$?

    (A) $\dfrac{11}{5}$　　　　(B) $\dfrac{11}{6}$　　　　(C) $\dfrac{5}{11}$　　　　(D) $\dfrac{6}{11}$

15. If the sum of the cubes of three numbers is 4500, and their ratio is 1 : 2 : 3, what is the value of the smallest number between them?
    (A) 6　　　　(B) 5　　　　(C) 3　　　　(D) 4

16. If the equations 14x + 8y + 5 = 0 and 21x – ky – 7 = 0 have no solution, then the value of k is:
    (A) 12　　　　(B) –12　　　　(C) 8　　　　(D) –16

Section – II : Challenging Questions

17. What is the least number of soldiers that can be drawn up in troops of 12, 15, 18 and 20 soldiers and also in form of a solid square?
    (A) 900　　　　(B) 400　　　　(C) 1600　　　　(D) 2500

18. A few students went on a trip and the total amount planned to be spent was ₹ 96. However, 4 students did not turn up and as a result the remaining students had to contribute ₹ 4 extra. The students who attended the trip was:
    (A) 12　　　　(B) 6　　　　(C) 8　　　　(D) 10

19. If the ratio of two positive numbers is 7 : 9 and their product is 1575, then the greatest number is
    (A) 45　　　　(B) 15　　　　(C) 35　　　　(D) 55

20. Consider the following frequency distribution:

Class	0 – 5	6 – 11	12 – 17	18 – 23	24 – 29
Frequency	13	10	15	8	11

    The upper limit of the median class is
    (A) 17　　　　(B) 17.5　　　　(C) 18　　　　(D) 18.5