International Talent Search Examination - 2022-23

अंतर्राष्ट्रीय प्रतिभा खोज परीक्षा – २०२२-२३

Organized by

Savitri Skill Development Institute, Training Partner with
Ministry of Micro Small & Medium Enterprises (MSME), Govt. of India.

Ministry of Micro, Small and Medium Enterprises, Government of India

TEST BOOKLET

Name : ....

Class : .... School: ....

Father's Name : .... Father's Occupation : ....

Mother's Name : .... Mother's Occupation : ....

Categories : Gen ☐   OBC ☐   SC ☐   ST ☐

Correspondence Address :..

Date of Birth : ☐☐ ☐☐ ☐☐☐☐

Father's Contact No : ☐☐☐☐☐☐☐☐☐☐

Home/Mother's Contact No. : ☐☐☐☐☐☐☐☐☐☐

WhatsApp No. : ☐☐☐☐☐☐☐☐☐☐

Basic Instructions:

i. Ensure that your personal data has been entered correctly.
ii. Immediately after opening the test booklet verify that all the pages are printed properly and are in order. If there is a problem with your test booklet, immediately inform the invigilator. You will provided with the replacement.
iii. All questions in are compulsory.
iv. For every correct answer you will be awarded with 4 marks and for all incorrect answer 1 mark will be deducted.
v. Directions for answering the questions are given. Read those directions carefully and answer the question by circling the bubble in the OMR Sheet Provided to you. Test booklet/OMR Sheet will be submitted at the end of the examination.
vi. Follow the instructions given by the invigilator. Students found violating the instructions will be disqualified.
vii. Rough work can be done separately or on the Question paper.
viii. Please fill the bubbles in OMR sheet with Blue or Black pen only.
ix. Do not tear the question paper or OMR sheet else you will be disqualified in the examination.

CLASS-10 MATHEMATICS

1. If two positive integers a and b are written as

   $a = x^3y^2$ and $b = xy^3$; x, y are prime numbers, then HCF (a, b) is

   (A) xy (B) xy^2 (C) x^3y^3 (D) x^2y^2

2. If two positive integers p and q can be expressed as

   $p = ab^2$ and $q = a^3b$; a, b being prime numbers, then LCM (p, q) is

   (A) ab (B) a^2b^2 (C) a^3b^2 (D) a^3b^3

3. The product of a non-zero rational and an irrational number is

   (A) always irrational   (B) always rational

   (C) rational or irrational   (D) one

4. If $x = a$, $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of a and b are, respectively

   (A) 3 and 5   (B) 5 and 3

   (C) 3 and 1   (D) –1 and –3

5. Aruna has only Re 1 and Rs 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs 75, then the number of Re 1 and Rs 2 coins are, respectively

   (A) 35 and 15   (B) 35 and 20

   (C) 15 and 35   (D) 25 and 25

6. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively

   (A) 4 and 24   (B) 5 and 30

   (C) 6 and 36   (D) 3 and 24

7. The zeroes of the quadratic polynomial $x^2 + kx + k$, $k \neq 0$,

   (A) cannot both be positive   (B) cannot both be negative

   (C) are always unequal   (D) are always equal

8. If the zeroes of the quadratic polynomial $ax^2 + bx + c$, $c \neq 0$ are equal, then

(A) c and a have opposite signs   (B) c and b have opposite signs

(C) c and a have the same sign   (D) c and b have the same sign

9. If one of the zeroes of a quadratic polynomial of the form $x^2 + ax + b$ is the negative of the other, then it

(A) has no linear term and the constant term is negative.

(B) has no linear term and the constant term is positive.

(C) can have a linear term but the constant term is negative.

(D) can have a linear term but the constant term is positive.

10. Two APs have the same common difference. The first term of one of these is -1 and that of the other is -8. Then the difference between their 4th terms is

(A) -1 (B) -8 (C) 7   (D) -9

11. If 7 times the 7th term of an AP is equal to 11 times its 11th term, then its 18th term will be

(A) 7   (B) 11   (C) 18   (D) 0

12. The 4th term from the end of the AP: $-11, -8, -5, ..., 49$ is

(A) 37   (B) 40   (C) 43   (D) 58

13. If $px^2 + qx + r = 0$ has equal roots, value of r will be

(a) $\dfrac{q^2}{4p}$ (b) $-\dfrac{q^2}{4p}$

(c) $\dfrac{4p}{q^2}$ (d) none of these

14. Positive value of p for which equation $x^2 + px + 64 = 0$ and $x^2 - 8x + p = 0$ will both have real roots will be

(a) $p \geq 16$ (b) $p \leq 16$

(c) $p = 16$ (d) none of these

15. If equation $9x^2 + 6px + 4 = 0$ has equal roots, then both roots are equal to

(a) $\pm\dfrac{2}{3}$ (b) ± 3

(c) $\pm\dfrac{3}{2}$ (d) 0

16. If the equation $x^2 - kx + 1$, have no real roots, then

(a) $-2 < k < 2$ (b) $-3 < k < 3$

(c) $k > 2$ (d) $k < -2$

17. If in triangles ABC and DEF, $\dfrac{AB}{DE} = \dfrac{BC}{FD}$, then they will be similar, when

(A) $\angle B = \angle E$ (B) $\angle A = \angle D$

(C) $\angle B = \angle D$ (D) $\angle A = \angle F$

18. If $\triangle ABC \sim \triangle QRP$, $\dfrac{ar(ABC)}{ar(PQR)} = \dfrac{9}{4}$, AB = 18 cm and BC = 15 cm, then PR is equal to

(A) 10 cm   (B) 12 cm   (C) $\dfrac{20}{3}$ cm   (D) 8 cm

19. If S is a point on side PQ of a $\triangle$ PQR such that PS = QS = RS, then

(A) PR . QR = RS^2 (B) $QS^2 + RS^2 = QR^2$

(C) $PR^2 + QR^2 = PQ^2$ (D) $PS^2 + RS^2 = PR^2$

20. The fourth vertex D of a parallelogram ABCD whose three vertices are A (–2, 3), B (6, 7) and C (8, 3) is

(A) (0, 1)   (B) (0, –1)   (C) (–1, 0)   (D) (1, 0)

21. If the point P (2, 1) lies on the line segment joining points A (4, 2) and B (8, 4), then

(A) AP = $\dfrac{1}{3}$ AB   (B) AP = PB   (C) PB = $\dfrac{1}{3}$ AB   (D) AP = $\dfrac{1}{2}$ AB

22. If P $\left(\dfrac{a}{3}, 4\right)$ is the mid-point of the line segment joining the points Q (– 6, 5) and R (– 2, 3), then the value of a is

(A) – 4   (B) – 12   (C) 12   (D) – 6

23. To divide a line segment AB in the ratio 5 : 6, draw a ray AX such that $\angle BAX$ is an acute angle, then draw a ray BY parallel to AX and the points A_1, A_2, A_3, ... and B_1, B_2, B_3, ... are located at equal distances on ray AX and BY, respectively. Then the points joined are

(A) A_5 and B_6 (B) A_6 and B_5 (C) A_4 and B_5 (D) A_5 and B_4

24. To construct a triangle similar to a given ΔABC with its sides $\dfrac{3}{7}$ of the corresponding sides of ΔABC, first draw a ray BX such that $\angle CBX$ is an acute angle and X lies on the opposite side of A with respect to BC. Then locate points B_1, B_2, B_3, ... on BX at equal distances and next step is to join

(A) B_{10} to C   (B) B_3 to C   (C) B_7 to C   (D) B_4 to C

25. To construct a triangle similar to a given ΔABC with its sides $\dfrac{8}{5}$ of the corresponding sides of ΔABC draw a ray BX such that $\angle CBX$ is an acute angle and X is on the opposite side of A with respect to BC. The minimum number of points to be located at equal distances on ray BX is

(A) 5   (B) 8   (C) 13   (D) 3

26. If $\cos (\alpha + \beta) = 0$, then $\sin (\alpha - \beta)$ can be reduced to
(A) $\cos \beta$ (B) $\cos 2\beta$ (C) $\sin \alpha$ (D) $\sin 2\alpha$

27. The value of $(\tan 1° \tan 2° \tan 3° ... \tan 89°)$ is

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

28. If $\cos 9\alpha = \sin \alpha$ and $9\alpha < 90°$, then the value of $\tan 5\alpha$ is

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

29. In Fig. 9.5, AT is a tangent to the circle with centre O such that OT = 4 cm and ∠OTA = 30°. Then AT is equal to

(A) 4 cm   (B) 2 cm

(C) $2\sqrt{3}$ cm   (D) $4\sqrt{3}$ cm
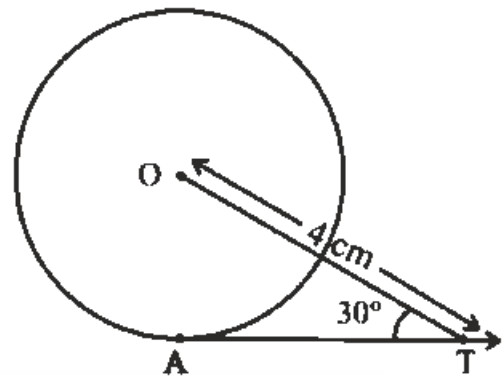
Fig. 9.5

30. In Fig. 9.6, if O is the centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ, then ∠POQ is equal to

(A) 100°   (B) 80°

(C) 90°   (D) 75°

Fig. 9.6

31. In Fig. 9.7, if PA and PB are tangents to the circle with centre O such that ∠APB = 50°, then ∠OAB is equal to

(A) 25°   (B) 30°

(C) 40°   (D) 50°

Fig. 9.7

32. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is

(A) 22 : 7   (B) 14 : 11   (C) 7 : 22   (D) 11 : 14

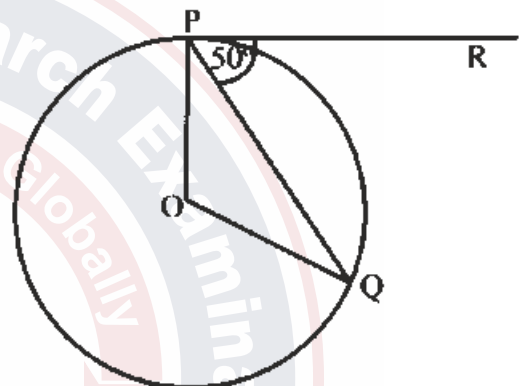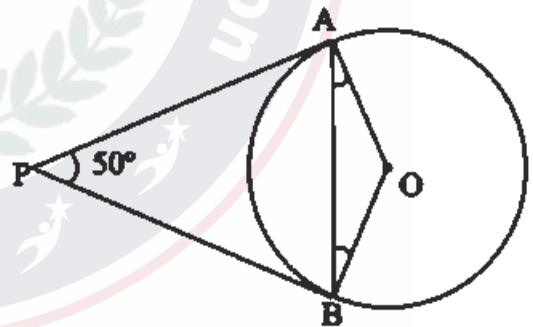33. It is proposed to build a single circular park equal in area to the sum of areas of two circular parks of diameters 16 m and 12 m in a locality. The radius of the new park would be

    (A) 10 m   (B) 15 m   (C) 20 m   (D) 24 m

34. The area of the circle that can be inscribed in a square of side 6 cm is

    (A) 36π cm^2 (B) 18π cm^2 (C) 12π cm^2 (D) 9π cm^2

35. Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2 cm and height 16 cm. The diameter of each sphere is

    (A) 4 cm   (B) 3 cm   (C) 2 cm   (D) 6 cm

36. The radii of the top and bottom of a bucket of slant height 45 cm are 28 cm and 7 cm, respectively. The curved surface area of the bucket is

    (A) 4950 cm^2 (B) 4951 cm^2 (C) 4952 cm^2 (D) 4953 cm^2

37. A medicine-capsule is in the shape of a cylinder of diameter 0.5 cm with two hemispheres stuck to each of its ends. The length of entire capsule is 2 cm. The capacity of the capsule is

    (A) 0.36 cm^3 (B) 0.35 cm^3 (C) 0.34 cm^3 (D) 0.33 cm^3

38. If $x^2 + 5px + 16$ has no real roots, then

    (a) $p > \dfrac{8}{5}$

    (b) $\dfrac{-8}{5} < p < \dfrac{8}{5}$

    (c) $p < \dfrac{-8}{5}$

    (d) none of these

39. For $ax^2 + bx + c = 0$, which of the following statement is wrong?

    (a) If $b^2 - 4ac$ is a perfect square, the roots are rational.
    (b) If $b^2 = 4ac$, the roots are real and equal.
    (c) If $b^2 - 4ac$ is negative, no real roots exist.
    (d) If $b^2 = 4ac$, the roots are real and unequal.

40. If $(x + 1)$ is a factor of $2x^3 + ax^2 + 2bx + 1$, then find the values of a and b given that $2a - 3b = 4$
    (a) $a = -1, b = -2$ (b) $a = 2, b = 5$ (c) $a = 5, b = 2$ (d) $a = 2, b = 0$

41. The number of zeroes that polynomial $f(x) = (x - 2)^2 + 4$ can have is:
    (a) 1   (b) 2   (c) 0   (d) 3

42. The zeroes of the polynomial $f(x) = 4x^2 - 12x + 9$ are:
    (a) $\frac{3}{2}, \frac{3}{2}$ (b) $-\frac{3}{2}, -\frac{3}{2}$ (c) 3, 4   (d) $-3, -4$

43. Customers are asked to stand in the lines. If one customer is extra in a line, then there would be two less lines. If one customer is less in line, there would be three more lines. Find the number of students in the class.
    (a) 40
    (b) 50
    (c) 60
    (d) 70

44. 8 girls and 12 boys can finish work in 10 days while 6 girls and 8 boys can finish it in 14 days. Find the time taken by the one girl alone that by one boy alone to finish the work.
    (a) 120, 130
    (b) 140,280
    (c) 240,280
    (d) 100,120

45. The sum of two digits and the number formed by interchanging its digit is 110. If ten is subtracted from the first number, the new number is 4 more than 5 times of the sum of the digits in the first number. Find the first number.
    (a) 46
    (b) 48
    (c) 64
    (d) 84