O. P. JINDAL SCHOOL, SAVITRI NAGAR

Half Yearly Examination - (2026 – 2027)

Class: X **MM: 50**

Subject: Mathematics **Time: 2Hrs.**

(Fifteen Minutes Extra will be given for reading the Question Paper.)

General Instructions:

i. *This question paper contains **23** questions. All questions are compulsory.*
ii. *This question paper is divided into **5 sections – Sections A,B,C,D and E.***
iii. ***Section A** comprises **10** questions (Q. no.1to 10) of **1** mark each.*
iv. ***Sections B** comprises **5** questions (Q. no.11to 15) of **2** marks each.*
v. ***Section C** comprises **4** questions (Q. no.16 to 19) of **3** marks each.*
vi. ***Section D** comprises **2** questions (Q. no.20 to 21) of **5** marks each.*
vii. ***Section E** comprises **2** questions (Q. no.22to 23) of case study based carrying 4 marks each.*
viii. *There is no overall choice. However an internal choice has been provided. You have to attempt only one of the alternatives in all such questions.*
ix. *Use of calculator is not allowed.*

Section – A

Choose the correct option:

Q1. The number $3 + \sqrt{2}$ is:
a) a rational number b) an irrational number c) a natural number d) an integer

Q2. Find a quadratic polynomial whose sum and product of zeroes are 0 and $\sqrt{5}$ respectively.
a) $5x^2 - 5$ b) $x^2 - \sqrt{5}$ c) $x^2 + \sqrt{5}$ d) none of these

Q3. If the lines $3x+2ky-2=0$ and $2x+5y+1=0$ are parallel, then what is the value of k?
a) 4/15 b) 15/4 c) 4/5 d) 5/4

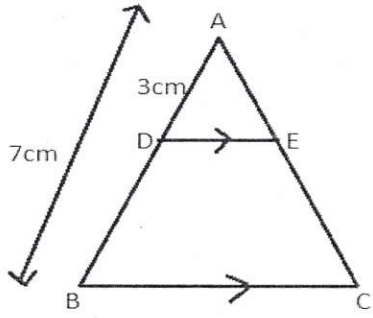
Q4. The pairs of equations $x+2y-5=0$ and $-4x-8y+20=0$ have:
a) Unique solution b) Exactly two solutions
c) Infinitely many solutions d) No solution

Q5. If the quadratic equation $x^2 - 8x + k = 0$ has real roots, then
a) $k < 16$ b) $k \leq 16$ c) $k > 16$ d) $k \geq 16$

Q6. Which term of the A.P. -29, -26, -23,……,61 is 16?
a) 16^{th} term b) 11^{th} term c) 10^{th} term d) 31^{st} term

Q7. If the coordinates of vertices of a triangleABC are A(0, 5), B(- 6, 0) and C(6, 0), then find the length of the median AD.
a) 2 units b) 3 units c) 4 units d) 5 units

Q8. In the given figure, DE || BC. If AD = 3 cm, AB = 7 cm and EC = 3 cm, then the length of AE is



a) 2 cm b) 2.25 cm c) 3.5 cm d) 4 cm

Q9. If $\sin A = \frac{2}{3}$ then the value of sec A is

a) $\frac{\sqrt{5}}{3}$ b) $\frac{2}{3}$ c) $\frac{3}{\sqrt{5}}$ d) $\frac{\sqrt{5}}{2}$

Q10. **Assertion(A):** The value of $\frac{tan60°}{cot60°} = 3$

Reason(R): The value of the expression (sin0° - cos0°) is negative.

a) Both assertion (A) and reason(R) are true and reason (R) is correct explanation of assertion(A).
b) Both assertion (A) and reason(R) are true and reason (R) is not the correct explanation of assertion (A).
c) Assertion(A) is true but reason (R) is false.
d) Assertion(A) is false but reason (R) is true.

Section- B

Answer the following questions:

Q11. If the 3rd and the 9th terms of an A.P are 4 and - 8 respectively. Which term of this A.P is zero.

OR

Find the sum of the first 15 multiples of 8.

Q12. If $\sin(A - B) = \frac{1}{2}$, $\cos(A + B) = \frac{1}{2}$, $0° < (A + B) \leq 90°$, A > B, find A & B.

OR

Evaluate: $\frac{sin\ 30° + tan45° - cosec60°}{sec30° + cos60° + cot45°}$

Q13. Find the ratio in which the line segment joining the points (- 3, 10) and (6, - 8) is divided by (- 1, 6).

Q14. Find the value of "p" from the polynomial $x^2 + 3x + p$, if one of the zeroes of the polynomial is 2.

Q15. Find the value of k for which the roots of the equation $3x^2 - 10x + k = 0$ are reciprocal of each other.

Section- C

Q16. Show that $3\sqrt{2}$ is irrational.

Q17. E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\Delta ABE \sim \Delta CFB$.

Q18. Find the coordinates of the points which divide the line segment joining A(-2, 2) and B(2, 8) into four equal parts.

Q19. Prove that: $(\text{cosec } A - \sin A)(\sec A - \cos A) = \frac{1}{\tan A + \cot A}$

OR

Prove that: $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \text{Cosec } \theta + \text{Cot } \theta$

Section- D

Q20. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.

Q21. Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.

OR

CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively. If $\Delta ABC \sim \Delta FEG$, show that:

(i) $\frac{CD}{GH} = \frac{AC}{FG}$ (ii) $\Delta DCB \sim \Delta HGE$ (iii) $\Delta DCA \sim \Delta HGF$

Section E
(Case – Based Questions)

Q22. A test consists of 'True' or 'False' questions. One mark is awarded for every correct answer while ¼ mark is deducted for every wrong answer. A student knew answers to some of the questions. Rest of the questions he attempted by guessing. He answered 120 questions and got 90 marks.

(i) How many questions he guess correct? (1)

(ii) How many questions he guess wrong? (1)

(iii) If he guess 80 questions correct out of 120 questions, then how many marks he will get? (1)

(iv) If he got total marks 95 then how many questions he guess wrong if he attempted 120 questions? (1)

Q23. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.

(i) Find the production during first year. (1)

(ii) Find the production during 8^{th} year. (1)

(iii) In which year production is 29,200 ? (1)

(iv) What is the difference of production during 2^{nd} and 4^{th} year?(1)

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