J B Academy, Ayodhya
Half Yearly Examination
Class-10th

Subject- Mathematics

Time Allowed: 3 Hours **Maximum Marks: 80**

Note: All questions are compulsory. Section A carries 1 mark each, Section B carries 2 marks each, Section C carries 3 marks each, Section D carries 5 marks each & Section E carries 4 marks each.

Section-A

Choose the correct option:

Q1) HCF of two numbers 32 and 48 will be

a) 8 b) 16 c) 4 d) None of these

Q2) Polynomial $x^3+x^2y^2+y^5$ has degree

a) 4 b) 3 c) 5 d) None of these

Q3) If one zero of the polynomial $6x^2+37x-(k-2)$ is reciprocal of the other then the value of k is

a) -4 b) -6 c) 6 d) None of these

Q4) The zeroes of the polynomial $p(x)=x^2+4x+3$ are

a) 1,3 b) -1,3 c) 1,-3 d) None of these

Q5) If the pair of equation 3x-y+8=0 and 6x-ky+16=0 represent coincident lines then the value of k is

a) -1/2 b) -2 c) 2 d) None of these

Q6) The pair of equations x=a and y=b graphically represents lines which are

a) Parallel b) Intersecting at (a, b) c) Coincident d) None of these

Q7) If 2x+3y=15 and 3x+2y=25 then the value of x-y is

a) 10 b) -10 c) 8 d) None of these

Q8) The nature of roots of the quadratic equation $9x^2-6x-2=0$

a) No real roots b) 2 equal real roots

c) More than 2 real roots d) 2 distinct real roots

Q9) The discriminant of quadratic equation $3\sqrt{2}x^2-\sqrt{3}x-\sqrt{18}=0$ is

a) 75 b) 50 c) 60 d) None of these

Q10) The quadratic equation whose roots are real and equal is

a) $2x^2-4x+3=0$ b) $x^2-4x+4=0$ c) $3x^2-5x+2=0$ d) None of these

Q11) Next term of AP $\sqrt{3},\sqrt{12},\sqrt{27},$----

a) 9 b) $\sqrt{72}$ c) $\sqrt{48}$ d) None of these

Q12) If 17^{th} term of an AP exceeds its 10^{th} term by 14 then the comman difference is

a) 1 b) 2 c) 7 d) None of these

Q13) In an AP 4, 7, 10, 13, ---- how many terms will add up to a sum of 851?

a) 16 b) 24 c) 22 d) None of these

Q14) The distance between A(1, 3) and B(x, 7) is 5. The possible values of x are

a) 4,-2 b) 2,4 c) 3,2 d) None of these

Q15) The perimeter of a triangle with vertices (0,4) (0,0) and (3,0) is

a) 8 b) 10 c) 12 d) None of these

Q16) Value of a so that the point (3,a) lies on the line 2x-3y=5 is

a) 12 b) 3 c) ½ d) None of these

Q17) If 3tanx=4 then sinx+cosx=

a) 3/5 b) 4/5 c) 7/5 d) None of these

Q18) If θ=30º then $\frac{1-\tan^2\theta}{1+\tan^2\theta}$ is

a) ½ b) 1/3 c) 2 d) None of these

Q19) The mean of first 10 multiples of 4 is

a) 22 b) 44 c) 48 d) None of these

Q20) If mode=80, mean=110 then the median is

a) 110 b) 120 c) 100 d) None of these

Section-B

Q21) Show that the points (-2, 3) (8, 3) and (6, 7) are the vertices of a right angled triangle.

Q22) If $4\cot^2 45º-\sec^2 60º+\sin^2 60º+p=3/4$, then the find the value p.

OR

Evaluate $2\cos^2 45º-3\tan^2 45º+4\sin^2 90º$

Q23) The ratio of incomes of two persons is 9:7 and the ratio of their expenditures is 4:3. If each of them saves 200Rs per month, find their monthly incomes.

Q24) For what value of n are the n^{th} terms of two AP's 63,65,67,---- and 3,10,17,---- equal?

Q25) Solve the quadratic equation $8x^2+2x-3=0$ by using quadratic formula.

Section-C

Q26) Prove that $\sqrt{5}$ is an irrational number.

Q27) Find a quadratic polynomial whose zeroes are the reciprocal of the zeroes of

$4x^2-3x-1$.

Q28) The sum of ages of father and his son is 45 years. 5 years ago the product of their age was 124. Find their present ages. Pg.2

Q29) 5 chairs and 3 tables cost Rs 2850. 3 chairs and 2 tables cost Rs 1850. Find the cost 1 chair and 1 table.

OR

If three times the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also if seven times the smaller number is divided by the larger one we get 5 as quotient and 3 as remainder. Find the numbers.

Q30) If $\tan(A+B)=\frac{\tan A+\tan B}{1-\tan A\tan B} \wedge \tan A=\frac{1}{2}\tan B=\frac{1}{3}$, find the value of $A+B$.

OR

If $\cos A=\frac{4}{5}$. Find the value of $\sec^2 A-\tan^2 A$

Q31) Find the mode of the following frequency distribution

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	10	10	16	12	6	7

Section-D

Q32) Solve the equation graphically x-y=1 , 2x+y=8. Shade the area bounded by these two lines and y-axis. Also determine this area.

Q33) The sum of first m terms of an AP is $4m^2-m$. If its n^{th} term is 107. Find the value of n. Also find the 21^{st} term of this AP.

OR

Which term of the sequence 7.3, 6.9, 6.5, 6.1,---- is the first negative term?

Q34) Prove the identity $\frac{\tan A}{1-\cot A}+\frac{\cot A}{1-\tan A}=1+cosec\ A\ sec\ A$

OR

$(\sin A+\operatorname{cosec} A)^2+(\cos A+\sec A)^2=7+\tan^2 A+\cot^2 A$

Q35) Find the median of the following data

Weight in Kg	36-38	38-40	40-42	42-44	44-46	46-48	48-50	50-52
No. of students	0	3	5	9	14	28	32	35

Section-E

Q36) Manpreet Kaur is the national record holder for women in the shot put. Her throw for 18.86m at the Asian Grand Prix in 2017 is the biggest distance for an Indian female athlete. Keeping her as a role model, Sanjitha is determined to earn gold in Olympics on day. Being an athlete in school, she regularly practiced both in the mornings and in evenings and was able to improve the distance by 9cm every week. During the special camp for 15 days, she started with 40 throws and every day kept increasing the number of throws by 12 to achieve this remarkable progress.

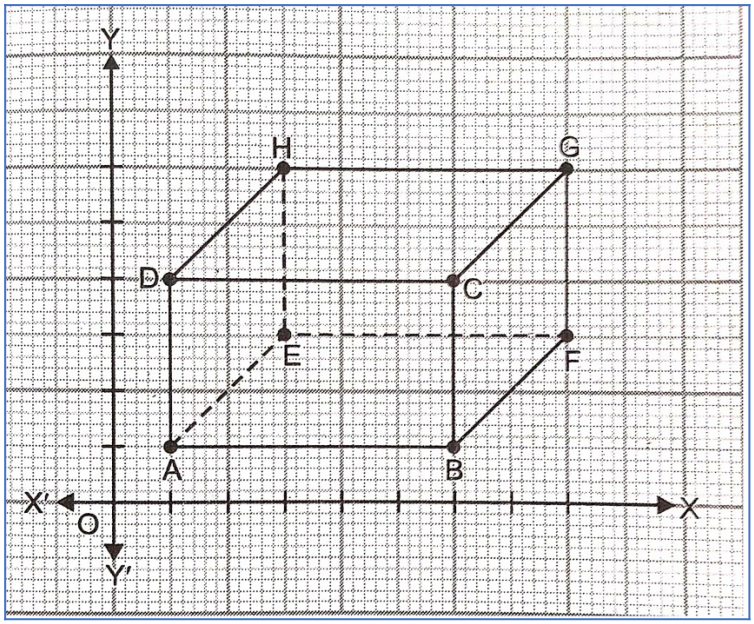
a) How many throws Sanjitha practiced on 11^{th} day of the camp?
b) What would be Sanjitha's throw distance at the end of 6 months?
c) When will she be able to achieve a throw of 11.16m?
d) How many throws did she do during the entire camp of 15 days?

Q37) Keshav and Balbir are very close friends. Both the families decide to go to Shimla by their own cars. Balbir's car travels at a speed of x km/h while Keshav's car travels 10 km/h faster than Balbir's car. Balbir took 5 hours more than Keshav to complete the journey of 300 km.

a) What will be the distance covered by Keshav's car in 6 hours?
b) Write q quadratic equation describe the sped of Balbir's car.
c) What is the speed of Balbir's car?
d) How much time took Keshav to travel 300 km.

Q38) As per medical science and latest research, keeping an aquarium in the house helps in treating stress, anxiety and health problems associated with blood pressure. It also provides visual stimulation which boost our creativity and focus. A beautiful sketch of an aquarium is drawn in shape of a cuboid as shown in the figure.

a) What are the coordinates of vertex C?
b) What are the dimensions of the aquarium as per graph?
c) Find the length of the longest rod that can be placed in the aquarium.
d) Find the length of the diagonal AC or HF.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