PAPER II

MATHEMATICS

Q1. **If $x+\frac{1}{x}=r_3$ then $x^3+\frac{1}{x_3}$ is**

(a) 3
(b) $3r_3$
(c) r_3
(d) 0

Q2. **One third of a number is greater then one fourth of its successor by 1, find the number**

(a) 15
(b) 20
(c) 5
(d) 25

Q3. **If $2^{x}=8^{y+1}$ & $9y=3^{x-9}$ then y in**

(a) 6
(b) 3
(c) 4
(d) 9

Q4. **The sum of two numbers is 24 & the sum of their reciprocal is $\frac{1}{5}$, find their product**

(a) 80 (b) 100
(c) 60 (d) 40

Q5. $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\text{K K K K}\left(1-\frac{1}{n}\right)=?$

(a) $\frac{1}{n}$ (b) $\frac{2x-1}{n}$
(c) $n\left(\frac{n+1}{n}\right)$ (d) None of these

Q6. **In two similar triangle ABC & PQR, if their corresponding altitudes AD & PS are in ratio of 4:9, find the ratio of the Area of Δ ABC to that of Δ PQR.**

(a) 16:81
(b) 32:92
(c) 33:94
(d) None of these

Q7. **Five year hence, father's age will be 3 times then the age of his son. Five years ago, father was 7 times as old as his son. Find their present age ?**

(a) 10, 40
(b) 5, 50
(c) 3, 30
(d) None of these

Q8. If α & β be the root of the equation $x^2 - px + 9$

(a) $p^2 - 2q$ (b) $p^2 + 2q$

(c) $p^2 - q^2$ (d) None of these

Q9. The value of $\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \left(\frac{x^c}{x^a}\right)^{c+a} = ?$

(a) 1 (b) 0

(c) x^{abc} (d) None of these

Q10. IF x + y = 12, the maximum value of the product of xy is

(a) 26 (b) 36

(c) 30 (d) None of these

Q11. Divide 50 into two parts x & y so that the sum of their reciprocals is $\frac{1}{12}$ and the parts are

(a) 30, 20 (b) 20, 30

(d) 40, 20

Q12. A man buys mangoes paying one variety Rs. 320 to 240 & another variety of 640 to 400. He mixes & sells them at16 mangoes for Rs. 30. Find the percentage of profit?

Q13. Two taps A & B take 20 minutes & 30 minutes to fill a cistern independently. The cistern can filled in 40 minutes with the taps A & B & the waste pipe are open altogether. If the taps are closed, calculate the time taken by the discharging outlet to empty the full cistern.

(a) 10 minutes
(b) 15 minutes
(c) 20 minutes
(d) None of these

Q14. The price of sugar has decreased by 20%, by what% are the consumption of the sugar be increased in a house so that there is no decrease in the expenditure on the sugar

Q15. Ram Babu deposits Rs. 280. Consisting of one rupee 50 paise & 10 paise coins which are in the ratio of 3:4:20. The number of 10 paise coins is

(a) 400 (b) 300

(c) 200 (d) None of these

Q16. A man borrows Rs. 2500 at 10% pa simple interest. He lends it in the same year & at the same time at 15% pa for 2 years compound annually. Find the C.I ?

Q17. The area of a square inscribed inside a circle of a radius is

(a) $2r^2$ (b) r^2

(c) $1r^2$ (d) None of these

Q18. The least number of square slab of side 1.25 which can be fitted in a varendah of 25 × 20 m is

(a) 320 (b) 340

(c) 280 (d) 200

Q19. While going for Station A to Station B a train traveled at a speed 100 km/h & 150 km/h during return. The average speed of train

(a) 120
(b) 180
(c) 130
(d) 140

Q20. While going for station A to station B a train travelled at a speed 100 km/hr and 150 km/hr during return. The average speed of train

(a) 120
(b) 180
(c) 130
(d) 140

Q21. The sum of length of minute hand of a clock is 14 cm. Find the area of swept by the minute hand in one minute.

(a) $10\frac{4}{5}$ (b) $5\frac{4}{5}$

(c) $6\frac{4}{15}$ (d) None of these

Q22. In fig. TAS is a tangent to the circle with center at O at a point A if $\angle OBA = 32^0$, find the value of x and y.

(a) 40^0
(b) 58^0
(c) 32^0
(d) None of these

Q23. Find the mean, mode and median

133, 73, 89, 108, 94, 140, 94, 85, 100, 120

Q24. A hemi – spherical bowl of internal diameter 36 cm contains a liquid in a cylindrical bottles of radius 3 cm and height 6 cm. How many bottled required

(a) 72
(b) 36
(c) 54
(d) None of these

Q25. The value of $\frac{\cos\theta}{\sin(90+\theta)} + \frac{\sin\theta}{\sin(180+\theta)} + \frac{\cos(90+\theta)}{\tan\theta}$

Is equal to

(a) 1 (b) 2

(c) 3 (d) 4

Q26. Which figure has the greatest area

(a) Triangle (b) Rectangular

(c) Hexagon (d) Circular

Q27. $\sin^2(90-\theta)+\cos^2(90-\theta)$ = ?

(a) 1 (b) 0

(c) $\sin^2\theta-\cos^2\theta$ (d) None of these

Q28. If $\cos\theta+\sin\theta=\sqrt{2}\cos\theta$, then value of $\cos\theta-\sin\theta$ = ?

(a) $\sqrt{2}\sin\theta$ (b) 0

(c) $\sqrt{2}\cos\theta$ (d) $2\sin\theta$

Q29. A shop keeper buys a number of books for Rs 80. If he had to bought 4 more books for the same amount, each book would have cost him Rs 1/ – less. How many books did he buy?

(a) 6 (b) 10

(c) 15 (d) 20

Q30. If $\frac{P}{9}=3+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{5}}}$ then find P/9.

(a) 93/29
(b) 47/15
(c) 101/49
(d) 55/47

Q31. If (x, y) are complex numbers then $\sqrt{x^2+y^2}$ is called its modulus. The modulli of a complex number and its conjugate

(a) are always equal
(b) are always different
(c) are off and on equal
(d) None of these.