Vidya Vikas Mandal's
Ramacrisna Madeva Salgaocar Higher Secondary School
Margao Goa

Std: XI VOC – CT Second Term Exam March, 2025 Duraton: 2 hr.
Date: 7 /03/25 Subject : Mathematics (voc) Marks:50

Instructions : 1) All questions are compulsory.
2) Write the number of questions clearly.

Question numbers from 1 to 4 carry 1 mark each.

1. Find the value of $^{12}C_{10}$
2. Find $\frac{dy}{dx}$ if
   $y = x^3 + 2x - 6$
3. Evaluate $\int 3x^2 + 5 \quad dx$
4. Evaluate $\int_1^2 2x + 3 \quad dx$

Question numbers from 5 to 12 carry 2 marks each.

5. In how many different ways can we form a number of 2 digits from the digits 1,2,3,4,5 if repetition of digits is not allowed .
6. Prove by method of Induction
   $1+2+3+\ldots\ldots\ldots + k + (K+1) = \frac{(k+1)(k+2)}{2}$
7. Write down the binomial expansion of
   $(p + q)^4$
8. Find $\lim_{x\to 2} \frac{x^2-4}{x^2-x-2}$
9. Differentiate the following w.r.t. x
   $y = 4x^5 + 2\sin x - 4\cos x + 7$
10. If $y = (3x - 4)^9$, find $\frac{dy}{dx}$
11. Find $\int (5x + 2)^4 - \sin x \, dx$
12. Find $\int_0^1 (4x^3 - 3x^2 + 2) \, dx$

Question numbers from 13 and 18 carry 3 marks each

13. Find

$$\lim_{x\to 3}\frac{x^3-x-24}{x^3+x^2-36}$$

14. If $y = \frac{(x^2+5)}{(2x+1)}$, find $\frac{dy}{dx}$

15. Find $\int \frac{4}{\sqrt{x+4}-\sqrt{x}}\,dx$

16. From 7 lawyers and 4 doctors a committee of 6 is to be formed. In how many ways this can be done if committee contains exactly 2 doctors.

17. In how many ways can 5 men, 4 women and 6 boys sit in a row so that all the men are together and so are all the women and all the boys.

18. Simplify each term, write down the binomial expansion of $(2x+5)^5$.

Question numbers from 19 and 21 carry 4 marks each

19. Differentiate the following w.r.t. x

$y = e^{3x^2-x+5} + 10^{\sin x} + \sqrt{x}$

20. Find

$$\lim_{x\to 3}\frac{\sqrt{x+6}-3}{x^2-9}$$

21. Integrate the following w.r.t. x

$\int \sin(3x+5) + \cos 4x + e^{2x} - 5$

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