Ramacrisna Madeva Salgaocar Higher Secondary School
Margao Goa

Std: XI Voc – CT | Second Term Exam, March-2024 | Duration: 2 hr
Date: 22/03/24 | Subject: Mathematics | Marks: 50

Instructions:

i) All questions are compulsory.

ii) There are four sections in this question paper (A, B, C & D)

iii) In section A there are 10 questions of 1 mark each.

iv) Section B contains 6 questions of 2 marks each.

v) Section C contains 4 questions of 3 marks each.

vi) Section D contains 4questions of 4 marks each.

vii) Write the number of each question clearly in the answer book.

Section A

Question numbers from 1 to 10 carry 1 mark each.

1. Find the value of ${}^{10}C_5$
2. Lim $_{x->3}$ x^4
3. Differentiate $y = x^2 + 4x^3$
4. Differentiate using chain rule, $y = (x^2 + x + 4)^7$
5. Integrate $\int 1dx$
6. $\int \sin x \, dx$
7. $_1\int^2 (4x + 3)dx$
8. Find the value of ${}^6P_2$
9. Differentiate $y = e^{2x}$
10. Write the formula of combination?

Section B

Question numbers from 11 to 16 carry 2 marks each.

11. $\lim_{x \to 4} \frac{x^3 + x - 7}{x^2 + 3x - 2} = \frac{16}{26}$

12. Find $\lim_{x \to 2} \frac{\sqrt{(x+2)} - 2}{x^2 - 4}$

13. Differentiate $y = x^4 - 4x^2 + 7/x + 3\sqrt{x} - 5$

14. Integrate $\int x(x^2-1)^2 dx$

15. If ${}^8P_5 = {}^7P_5 + k.{}^7P_4$

16. How many numbers of two different digits can be formed by using the digits 1, 2,3,4,5?

Section C

Question numbers from 17 to 20 carry 3 marks each.

17. ${}_1\int^2 (3x^2 + 2x + k)\, dx = 8$, find k.

18. Differentiate 4 sinx cosx

19. Find $\lim_{x \to 2} \frac{x^3 - 27}{\sqrt{(x^2+7)} - 4}$

20. Integrate $\int x^4 - 3x^2 + 7x + 4\sqrt{x} - 5$

Section D

Question numbers from 21 to 24 carry 4 marks each.

21. Prove that

$$\int_5^{10} \frac{1}{(x-1)(x-2)}\,dx = \log\left(\frac{32}{27}\right)$$

22. Prove by method of Mathematical induction that

$$1 + 2 + 3 + \ldots\ldots + n = \frac{n\,(n+1)}{2}$$

23. From 7 professors and 10 students, a committee of 5 is to be formed. In how many ways can this be done, if the committee contains

a) exactly 3 professors

b) at least 4 professors?

24. Integrate using formulae

$$\int \frac{\sin x}{8 + 3\cos x}\,dx$$