

Mathematics  
Internal Exam 18-21

matty

①

Sem = IV Paper - case VIII

Answer any two ques.

① Find the cube roots of 10.

② Solve the system of eqns.

$$2x + 3y + z = 9$$

$$x + 2y + 3z = 6$$

$$3x + y + 2z = 8$$

③ The values of  $x$  and  $y$  are given below

$x$	5	6	9	11
$y$	12	13	14	16

Find the value of  ~~$x$~~   $y$  when  $x =$

④ Established Simpson's  $\frac{3}{8}$  the rule.

or

Established Boole's rule.



Integral exam 18-21 mally

(2)

Section IX Paper core IX

Answer any three questions but Question 1 is compulsory.

- ① (a) Define Riemann integrability
- (b) Define improper integral
- (c) Define Beta function
- (d) Define Gamma function
- (e) Define power series.

② Prove that every bounded constant function on  $[a, b]$  is R-integrable.

③ Prove that the improper integral  $\int_1^{\infty} \frac{dx}{x^n}$  is convergent if  $n < 1$  & diverge if  $n \geq 1$ .

④ Show that  $\int_1^{\infty} \frac{dx}{(x+1)\sqrt{x^2-1}}$  is convergent.

⑤ Expression of  $\int_0^{\pi/2} \cos^m \theta \cdot \sin^n \theta$  in terms of Gamma Function.

or  
Evaluate  $\int_0^1 x^p (1-x^q)^n dx$



Interoral exam 18-22 Maths

Sem-IV Paper - Core X

Answer any three ques but A.N.1 is compulsory.

- ①
- (a) Define ring.
  - (b) Define integral domain.
  - (c) Define field.
  - (d) Define vector space.
  - (e) Define vector subspace.

② Prove that the set of even integers is a commutative ring under addition & multiplication but has no unity element.

③ Prove that  $R$  is a ring with binary operation  $+$  &  $\cdot$  then for  $a, b, c \in R$

(i)  $(-a) \cdot (-b) = a \cdot b$

(ii)  $a \cdot (b - c) = a \cdot b - a \cdot c$

④ Prove that Every field is an integral domain but converse is not true.

⑤ Prove that the intersection of two subrings is a subring.



## Sem-IV Paper-GE

Answer any three ques but Q.1.1 is compulsory.

- 1) (a) Define group.
  - (b) Define subgroup.
  - (c) Define cyclic group.
  - (d) Define Normal subgroup.
  - (e) Define Ring.
- 2) Show that cube roots of unity is a group under multiplication.
  - 3) Prove that  $(ab)^{-1} = b^{-1}a^{-1} \forall a, b \in G$ .
  - 4) Prove that intersection of two subgroup is subgroup.
  - 5) Prove that Every cyclic group is an abelian group.
  - 6) State & prove Lagrange's theorem.