



KUVEMPU UNIVERSITY
OFFICE OF THE DIRECTOR
DIRECTORATE OF DISTANCE EDUCATION



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TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS (2009-10)

Course: B.Sc. Final Year (PCM & CBZ)

General Note: Students are advised to read the separate enclosed instructions regarding submission of Internal Assessment Assignments.

- Note: 1. Students to submit Internal Assignments of all the Optional Papers (PCM or CBZ) in accordance with the combination opted by them.*
- 2. Out of 15 Internal Assignment marks per Optional Paper, 5 marks are earmarked for the attendance of the student at the Counseling/ Contact/ Practical Programme. Therefore, the topics given below are only for 10 marks each paper. Also note that for Mathematics paper earmarked IA marks are 30 and hence topics are given for 25 marks.*

Topics in Optional Papers

PHYSICS

Paper- III: Spectroscopy, Wave mechanics, Statistical Mechanics, Relativity and Astrophysics

Topic Number	<i>Answer ALL topics. Each carries 5 marks</i>	Marks
1.	Obtain the Schrodinger's wave equation for a particle in a one dimensional box and solve it to obtain the energy eigen values. Also indicate graphically first three wave functions for such a particle.	05
2.	A rigid bar of length $L_2=1.5\text{m}$ is at rest relative to system S' . If the bar makes an angle $\Theta_2=45^\circ$ with respect to the X_2 axis, what is the length L_1 and orientation of the bar Θ_1 relative to system S when $V=0.98c$?	05

Paper- IV: Nuclear Physics, Solid State Physics and Electronics

Topic Number	<i>Answer ALL topics. Each carries 5 marks</i>	Marks
1.	Obtain the expression for electrical conductivity of a metal on the basis of free electron theory.	05
2.	A fixed frequency cyclotron magnet of radius 1m produces the maximum magnetic induction of 1.5T. Calculate the energy of the deuteron accelerated by it. What is the frequency of the radio frequency field in this case?	05

MATHEMATICS

Paper- III

Topic Number	<i>Answer ALL topics. Each carries 5 marks</i>	Maximum 25 Marks
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1. Define $f : C \rightarrow C$ such that $f(x + iy) = iy$. show that f is a homomorphism of the additive group of complex numbers into itself. Find $\ker f$. Verify whether f is an isomorphism.
2. Prove that the set $S = \{x \in R / xa = 0\}$ where 'R' is a ring and $a \in R$ is a left ideal of 'R'. Is it a right ideal also?
3. Show that the "plane $-x_3 = 0$ " is spanned by the vectors $(2,2,0)$ & $(4,1,0)$ in $V_3(R)$.
4. Prove that the non-zero orthogonal vectors $\alpha_1, \alpha_2, \dots, \alpha_m$ of a Euclidean vector space are Linearly Independent.
5. In an Euclidian vector space

Prove that $|\langle \alpha, \beta \rangle| \leq |\alpha| |\beta|$.

Paper- IV

Topic Number	<i>Answer ALL topics. Each carries 5 marks</i>	Maximum 25 Marks
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1. Test for rational roots for the equation $7x^3 + 3x^2 + 7x + 3 = 0$.
2. Show that the limit of a convergent sequence is unique.
3. Find the position and the nature of the double points of the curve $y(y - 6) = x^2(x - 2)^3 - 9$.
4. Find the envelope of the family of curves $\frac{x^2}{\alpha^2} + \frac{y^2}{k^2 - \alpha^2} = 1$.
5. Applying Integral test, examine the convergent of the series $\sum_{n=0}^{\infty} \frac{n^2 + 2n}{n^3 + 3n^2 + 1}$.

Paper- V

Topic Number	<i>Answer ALL topics. Each carries 5 marks</i>	Maximum 25 Marks
1.	Find the orthogonal trajectories of the following family curves. a) $\sin x \cosh y = c$ b) $e^{-x}(x \cos y + y \sin y) = c$.	
2.	Find $\int_c (x^2 - iy^2) dz$ along $y = 2x^2$ from (1, 2) to (2, 8).	
3.	State and prove Newton Gregory Forward Interpolation Formula. Give suitable example.	
4.	If α & $\beta \neq 0$ are fixed vectors of a Euclidean vector space, find the shortest vector of the form $\gamma = \alpha + t\beta$. Is this orthogonal to β ?	
5.	State and prove Euler's theorem and verify the Euler's theorem function $U = x^3 \log(y/x)$.	

CHEMISTRY**Paper- III**

	Marks
1. What are electrolytes? Give examples.	02
2. Explain Asymmetry effect and Electrophoretic effect of strong electrolytes.	03
3. Discuss the open chain structure of D-fructose.	03
4. Draw the Ellingham diagram and mention its salient features.	02

Paper- IV

	Marks
1. What are azo dyes? Give examples.	02
2. Give the synthesis of antipyrine and sulphathiazole.	03
3. Explain the factors affecting the stability of a complex ion.	03
4. Explain the quantisation of different forms of energies in a Molecule.	02

BOTANY**Paper- III**

Topic Number	<i>Answer ALL topics. Draw diagrams wherever necessary.</i>	Marks
1	Explain the structure, types and chemical composition of a Chromosome.	05
2	What are the salient features of family Apocyanaceae and Liliaceae.	05

Paper- IV

Topic Number	<i>Answer ALL topics. Draw diagrams wherever necessary.</i>	Marks
1	Explain Photoperiodism and Vernalization.	05
2	Explain the steps of tissue culture and add a note on its demerits.	05

ZOOLOGY**Paper- III**

Topic Number	<i>Answer ALL topics. Draw diagrams wherever necessary.</i>	Marks
1	Write a note on “speciation”.	05
2	Write a note on “mutation”.	05

Paper- IV

Topic Number	<i>Answer ALL topics Draw diagrams wherever necessary.</i>	Marks
1	Write a note on developmental stages Frog.	05
2	Write a note on wild life conservation in India.	05
