



KUVEMPU UNIVERSITY
OFFICE OF THE DIRECTOR
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TOPICS FOR INTERNAL ASSESSMENT ASSIGNMENTS (2019-20)

B.Sc. Final Year (PCM & CBZ)

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

Notes: 1) *Students are advised to read the separate enclosed instructions regarding submission of Internal Assessment Assignments.*

2) *Students to submit Internal Assignments of all the Optional Papers (PCM or CBZ) in accordance with the combination opted by the.*

3) *Out of 25 Internal Assignment marks per Paper (30 Marks for Mathematics Papers) 05 marks will be awarded for regularity (attendance) to Counseling/ Contact Programme classes pertaining to the paper. Therefore, the topics given below are only for 10 marks each paper (Mathematics papers 25 marks).*

Topics in Optional Papers

PHYSICS

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

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	What are continuous and characteristics X-rays? Derive Bragg's law for X-rays.	05 Marks
2.	Write a note on stellar magnitudes and hence state mass – luminosity relation. Using uncertainty principle, show that electrons do not exist inside the nucleus.	05 Marks

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

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	The ratio of the mass of Pb^{208} to the mass of U^{238} in a certain rock specimen is found to be 0.5. Assuming that the rock originally contained no lead. Estimate its age. Half life of uranium is 4.5×10^9 years.	05 Marks
2.	Describe full adder by using logic gates with necessary truth tables.	05 Marks

CHEMISTRY

Paper- III:

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	What are fuel cells? Explain H ₂ -O ₂ fuel cell with schematic diagram.	04 Marks
2.	Elucidate the structure of Citral.	04 Marks
3.	Explain briefly mutarotation of glucose.	02 Marks

Paper- IV:

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	Explain ionization isomerism of complex compounds with an example.	03 Marks
2.	Explain the synthesis of antipyrine and sulphathiazole.	03 Marks
3.	Discuss the free radical mechanism of addition polymerization.	04 Marks

MATHEMATICS

Paper- III:

Topic Number	<i>Answer all Topics</i>	Maximum 25 Marks
1.	State and prove Fundamental Theorem of Homomorphisms.	05 Marks
2.	Show that the set of all matrices of the form $\begin{pmatrix} 0 & x \\ 0 & y \end{pmatrix}$ where $x, y \in Q$ is a non-commutative ring without units with respect to addition and multiplication of matrices.	05 Marks
3.	Find the quotient and the remainder obtained by the division of $f(x) = x^6 + 3x^5 + 4x^2 - 3x + 2$ and $g(x) = x^2 - 2x + 3$ over Z_7 .	05 Marks
4.	Find K so that $(1, K, 5)$ is a linear combination of the vectors $(1, -3, 2)$ and $(2, -1, 1)$	05 Mark
5.	If $z = \log(\sqrt{x^2 + y^2})$ prove that $xz_x + yz_y = 1$.	05 Marks

Paper- IV:

Topic Number	Answer all Topics	Maximum 25 Marks
1.	Find the volume of the tetrahedron formed by the plane $x = 0, y = 0, z = 0$ and the plane $6x + 4y + 3z = 12$	05 Marks
2.	If c is the semicircle with centre at $(0, 4)$ and radius 2 units and lying in the first quadrant, evaluate $\int_C (x^2 - y^2) dx + x^3 y dy$	05 Marks
3.	Evaluate $\int_0^1 \frac{x^{2n}}{\sqrt{1-x^2}} dx$	05 Marks
4.	Solve $xy'' - 2(x + 1)y' + (x + 2)y = (x - 2)e^{2x}$ by finding the part of complementary function.	05 Marks
5.	Show that $\int_1^2 (3x + 1) dx = \frac{11}{2}$ using integral as limit of sum.	05 Marks

Paper- V:

Topic Number	Answer all Topics	Maximum 25 Marks
1.	Show that $L[f(t)] = \frac{1}{5} \tanh\left(\frac{5a}{4}\right)$ where $f(t) = \begin{cases} 1, & 0 < t < \frac{a}{2} \\ -1, & \frac{a}{2} < t < a \end{cases}$ and $f(t + a) = f(t)$.	05 Marks
2.	Solve the integral equation $f(t) = at + \int_0^t f(u) \sin(t - u) du$	05 Marks
3.	If $f(z) = u + iv$ then show that $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right) f(z) ^2 = 4 f'(z) ^2$	05 Marks
4.	Find the orthogonal trajectory of the family of curves $x^2 - y^2 + x = c$	05 Marks
5.	Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using (a) Trapezoidal rule (b) Simpson's $\frac{1}{3}$ rule.	05 Marks

BOTANY

Paper- III:

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	Explain the simple fruits with neat labeled diagram.	05 Marks
2.	Explain the salient features of family Verbenaceae and Cucurbitaceae with labeled diagram .	05 Marks

Paper- IV:

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	What is plant breeding? Describe the objectives and principles of plant breeding.	05 Marks
2.	Explain Embryo culture with appropriate diagrams and their applications .	05 Marks

ZOOLOGY

Paper- III:

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	Explain the modern concept of evolution.	05 Marks
2.	Explain the role of isolating mechanism in speciation.	05 Marks

Paper- IV:

Topic Number	<i>Answer all Topics</i>	Maximum 10 Marks
1.	Explain the advantages of bird migration.	05 Marks
2.	Describe the biota of desert biome and their applications.	05 Marks
