Semester	Course Type	Course Code	Nomenclature of paper	Credits	Contact hours	Internal marks	End term Marks	Total Marks	Duration of exam (Hrs) T / P
4	VOC	B23-VOC-207	Maintenance of Electrical Appliances	2	2	15	35	50	3
			Practicum	2	4	15	35	50	3

## Scheme of Examination for VAC/VOC

## Kurukshetra University Kurukshetra Undergraduate Programs <u>Course: CC-M4 (V)</u>

Session: 2024-25						
Part A - Introduction						
Subject	Physics					
Semester	4 <sup>th</sup>					
Name of the Course	Maintenance of Electrical Appliances					
Course Code	B23-VOC-207					
Course Type: (CC/MCC/MDC/CC- M/DSEC/ VOC/DSE/PC/AEC/VAC)	VOC					
Level of the course (Annexure-)	100-199	100-199				
Pre-requisite for the course (if any)	Student of the 4 <sup>th</sup> sem of any undergraduate scheme under NEP					
Course Learning Outcomes (CLO):	<ul> <li>After completing this course, the learner will be able to: <ol> <li>To acquire necessary skills/hands on experience/working knowledge of multimeters, galvanometers, ammeters, voltmeters, wattmeter and CRO.</li> <li>To acquire necessary skills/hands on experience/working knowledge of DC circuit, single and three phase circuit connections, basics of electrical wiring along with electrical protection devices.</li> <li>To understand the basic difference of earthing and grounding in circuits and home appliances.</li> <li>To understand the working principles of transformers, motors and different household domestic appliances.</li> </ol> </li> <li>To check and fault diagnosis of the electrical connections at household and also learn the skill to repair electrical appliances for the</li> </ul>					
Credits	Theory	Practical	Total			
	2	2	4			
Contact Hours	2	4	6			
Max. Marks: 100 Internal Assessment Marks: 30 End Term Exam Marks: 70 Part B- C	contents of the Co	Time: 3hrs				
I alt D- Contents of the Course						

1. N 2. Q 3. U	<ol> <li>Instructions for Paper- Setter</li> <li>Nine questions will be set in total.</li> <li>Question no. 1 will be compulsory and based on the conceptual aspects of the entire syllabus. This question may have 4 parts and the answer should be in brief but not in Yes/No.</li> <li>Four more questions are to be attempted, selecting one question out of two questions set from each unit. Each question may contain two or more parts.</li> <li>All questions will carry equal marks</li> </ol>		
5. 7	The question paper will be set in English and Hindi.		
Unit	Topics	Contact Hours	
Ι	<ul> <li>DC circuits: Electrical conductors, dielectrics and insulators materials, resistance, DC voltage source, Ohm's law, electrical circuit connections: series, parallel, star and delta connections of electrical elements.</li> <li>AC circuits: Inductance and capacitance, AC voltage sources, type of circuit reactance, circuit impedance, real power, reactive power, apparent power, power factor and its significance. Single-phase and three phase ac circuit connections.</li> </ul>	8	
II	Electrical machines: Construction and working of transformers, AC and DC motors. Measuring instruments: Elementary calculations for electrical circuit energy consumption, galvanometer, ammeters, voltmeters, wattmeter, multimeter, CRO, function generator.	7	
III	<b>Electrical wiring system</b> : Components of domestic wiring system and its connections diagrams, overloading and short circuiting of electrical circuits. <b>Protection and safety devices:</b> First aid for human under electric shock, electric shock protection, insulation, earthing and grounding system, fuses, relays, MCB and ELCB.	8	
IV	<b>Components and working principles of common home appliances:</b> Inverter and UPS, electric fan, electric rice cooker, electric toaster, electric kettle, electric iron, electric heater, water heater, induction heater, microwave oven, refrigerator, concept of illumination, electric bulbs, CFL, LED lights, energy efficiency in electrical appliances, IS and IE codes.	7	
	<ol> <li>Practicum         <ol> <li>To make a chart showing Dos and Don'ts of working with electricity.</li> <li>To make a chart of different tools used by a technician and write their utility for electrical appliances.</li> <li>Handling and use of various types of electrical maintenance tools.</li> <li>To make a chart of different types electrical elements likes switches, fuse, thermostat, heating elements, conductors, insulators, capacitors, wires and cables (for up to 15 amp) symbol of various components.</li> <li>Handling and use of multimeter for testing and measuring purpose of electrical appliances.</li> <li>Dismantling, re-assembling of various parts of transformer and its uses.</li> <li>Dismantling, re-assembling of various parts of DC and AC motors and their uses.</li> <li>Study of fault diagnosis in small rating electrical transformers and motors.</li> </ol> </li> </ol>	60	

<ul> <li>components.</li> <li>11. Dismantling, re-assembling and troubleshooting of electric room heater (rod type) electric rice cooker, electric toaster, electric kettle, electric iron, electric heater, and water heater.</li> <li>12. Dismantling, re-assembling and troubleshooting of induction heater and microwave oven.</li> <li>13. Dismantling, re-assembling and troubleshooting of refrigerator.</li> </ul>					
Note: Student will perform at least eight experiments. The examiner will allot one practical at the time of end term examination.					
Suggested Evaluation Methods					
Internal Assessment: ➤ Theory (15 Marks) • Class Participation: 05 Marks • Seminar/presentation/assignment/quiz/class test etc.:05 Marks	End Term Examination : 35 Marks				
<ul> <li>Mid-Term Exam: 5 Marks</li> <li>Practicum (15 Marks)</li> <li>Class Participation: Nil</li> <li>Seminar/Demonstration/Viva-voce/Lab records etc.:15 Marks</li> <li>Mid-Term Exam: Nil</li> </ul>	: 35 Marks				
Part C-Learning Resources					
<ul> <li>Recommended Books/e-resources/LMS:</li> <li>1. "A Text book on Electrical Technology", B.L. Theraja, S.Chand &amp; Co.</li> <li>2. "Basic Electrical Engineering", D. P. Kothari and I. J. Nagrath, Tata McGraw Hill, 2010.</li> <li>3. "Basic Electrical Engineering", D. C. Kulshreshtha, McGraw Hill, 2009.</li> <li>4. "Fundamentals of Electrical Engineering", L. S. Bobrow, Oxford University Press, 2011.</li> <li>5. "Handbook of Repair &amp; Maintenance of domestic electronics appliances, BPB Publications.</li> <li>6. "Consumer Electronics", S.P. Bali, Pearson Publications.</li> <li>7. "Domestic Appliances Servicing", K.P. Anwer, Scholar Institute Publications.</li> <li>8. "Electrical and Electronics Technology", E. Hughes, Pearson, 2010.</li> </ul>					

## NOTE: The medium of class and lab instructions will be English/Hindi