

RAN-2603000506031001

B.Sc. (Semester-VI) Examination March - 2026
Physics: MJ-PH-603 (Electrodynamics and Electronics)

[Total Marks: 25

સૂચના : / Instructions (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવર્ણી પર અવશ્ય લખવી. Fill up strictly the above details on your answer book. (2) Draw neat diagrams wherever necessary. (3) Symbols used in the paper have their usual meaning. (4) Figures to the right indicate full marks of the question. (5) Scientific calculator may be used.	Seat No.: <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> </table> Student's Signature						

- Q-1. Answer the following questions in brief: (Attempt any five) 05**
- 1) State Ohm's law.
 - 2) Define motional emf.
 - 3) What does the minus sign indicate in Faraday's law of electromagnetic induction?
 - 4) What is the unit of CMRR in Op-Amp.
 - 5) Define integrator in Op-Amp.
 - 6) Draw the pin diagram of IC-741.
- Q-2. A) Attempt any one of the following in details :- 06**
- a) Show that $\vec{J} = \sigma \vec{E}$ for a perfect conductor.
 - b) Discuss the Maxwell's Equations in matter.
- Q-2. B) Attempt any one of the following :- 04**
- a) How Maxwell fixed Ampere's law?
 - b) A cylindrical resistor of cross-sectional area A and length L is made from material with conductivity σ . If we stipulate that the potential is constant over each end, and the potential difference between the ends is V, what current flows?
- Q-3. Attempt any one of the following in details :- 06**
- a) Draw the block diagram of four types of feedback topologies and explain it.
 - b) Draw the inverting amplifier circuit of an op-amp in closed loop configuration. Obtain the expression for the closed loop gain.
- Q-3. B) Attempt any one of the following :- 04**
- a) Write short note on Voltage to current converter.
 - b) The 741C op-amp having the following parameters is connected as a voltage shunt inverting amplifier with $R_1 = 470\Omega$ and $R_F = 4.7 K\Omega$, $A = 200,000$, $f_0 = 8\text{Hz}$, $R_O = 75\Omega$ $R_i = 1M\Omega$. Compute the value of A_F , f_{oF} .