



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:III
Class:SY	Program:B.Tech
Branch Code:ROB	Pattern:2022
Name of Course:Electrical and Electronics Systems	Course Code:ROB222003
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains _____page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

- 1a) How field effect transistors are different from bipolar junction transistors? (6) CO1, CO3
Write any six applications of passive components in robotic industry.

Question No. 2 Attempt following Question

- 2a) What are relays? Explain operation in detail with diagram. State any four applications of relays in robotic industry. (6) CO1, CO2

Question No. 3 Attempt following Question

- 3a) Explain construction, working and applications of SCR in detail with relevant diagram and graphs. (8) CO3

OR

- 3b) Explain V-I characteristics of TRIAC in detail with graph. (8) CO3
state any four applications of TRIAC in automation industry.

- 3c) What are signal conditioning networks? (8) CO1, CO2, CO3
State any six application of signal conditioners in robotics and automation industry.

OR

- 3d) Explain in detail where optocouplers are used in automation industry. (8) CO1, CO3
state any six applications of MOSFET in automation industry.

Question No. 4 Attempt following Question

- 4a) Explain construction and working of DC generator in detail with neat and labeled diagram. (8) CO4

OR

- 4b) A D.C motor takes an armature current of 50 A at 240V. The armature circuit resistance is 0.25 ohm. (8) CO4,
The machine has 4 poles, and the armature is lap connected with 850 conductors. The flux per pole CO5
is 0.04 Wb.

Calculate: a) Speed b) Torque developed by the armature.

Explain any Four applications of DC motors in robotic industry.

- 4c) A D.C motor takes an armature current of 50 A at 230V. The armature circuit resistance is 0.25 ohm. (8) CO4,
The machine has 4 poles, and the armature is lap connected with 450 conductors. The flux per pole CO5
is 0.02 Wb. Calculate: a) Speed b) Torque developed by the armature.

Explain any Four applications of DC motors in robotic industry.

OR

- 4d) Write a short note on speed control methods in DC series and shunt motors with relevant graphs. (8) CO4

Question No. 5 Attempt following Question

- 5a) Explain the construction and working of stepper motors. Write any four industry applications of (8) CO4
stepper motors.

OR

- 5b) Explain the construction and working of universal motors. Write any four industry applications of (8) CO4,
universal motors. CO5

- 5c) Explain Torque slip characteristics of induction motors in detail. (8) CO4,
CO5

OR

- 5d) Explain brushless DC motors in detail with relevant diagram. (8) CO4,
CO5
state any four applications of brushless DC motors

XXXXXXXXXXXXXXXXXXXXXXXXXXXX