

Reg. No. :

Name :

Ph.D. ENTRANCE EXAMINATION 2023

FACULTY OF ENGINEERING AND TECHNOLOGY

ELECTRONICS AND COMMUNICATION ENGINEERING

Time : 3 Hours

Max. Marks : 100

Instructions :

- 1) Answer **any ten** questions each from Section A and Section B.
- 2) Each question carries **5** marks.
- 3) No additional Answer sheets will be provided.
- 4) Candidates should clearly indicate the section, Question number in the answer booklet.

Section – A

Research Methodology

- I. Answer any **ten** questions. Each Question carries **five** marks.
1. What do you mean by research? Explain its significance in modern times.
 2. Distinguish between Research methods and Research methodology.
 3. Describe the different types of research, clearly pointing out the difference between an experiment and a survey.
 4. Research is much concerned with proper fact-finding, analysis and evaluation". Do you agree with this statement? Give reasons in support of your answer.
 5. Describe the techniques of defining a research problem.
 6. Explain the meaning and significance of a Research design.

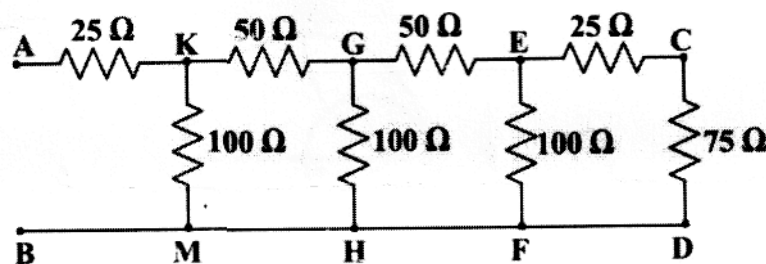
7. What are the stages of the research process?
8. Explain the significance of the literature survey.
9. Describe the characteristics of quantitative research problems.
10. Enumerate the different methods of collecting and analysing data.
11. Distinguish between Null hypothesis and Alternative hypothesis.
12. What is sampling? Briefly explain different methods of sampling.
13. What do you mean by multivariate analysis? How it differs from bivariate analysis?
14. Explain the term of analysis of variance.
15. Explain the significance of a research report and narrate the various steps involved in writing such a report.

(10 × 5 = 50 Marks)

Section – B

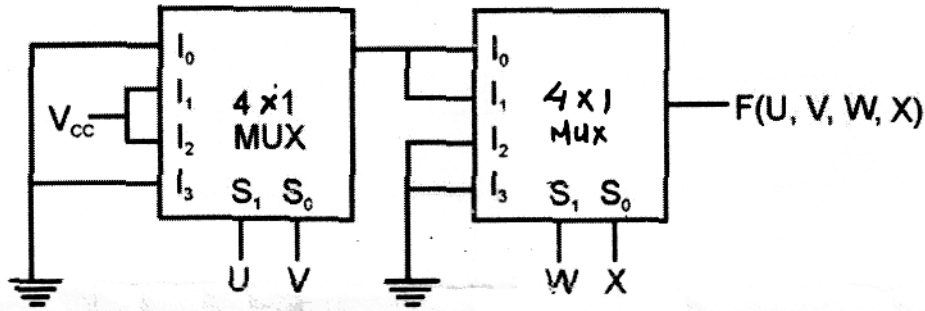
Electronics and Communication Engineering

- II. Answer any **ten** questions. Each Question carries **five** marks.
 1. Briefly outline the resistor colour coding scheme. Find the equivalent resistance across AB.

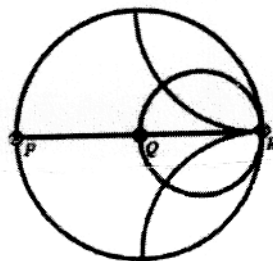


2. Discuss the parameters 'alpha' and 'beta' of a transistor and give the relationship between them. The collector current of a transistor varies by 1.987mA when its emitter current is varied by 2 mA. Compute the alpha and beta of the transistor.

3. What is the difference between depletion MOSET and enhancement MOSFET?
4. A four variable Boolean function is realized using 4×1 multiplexers as shown in the figure. Find out the minimized expression for the output $F(U, V, W, X)$.

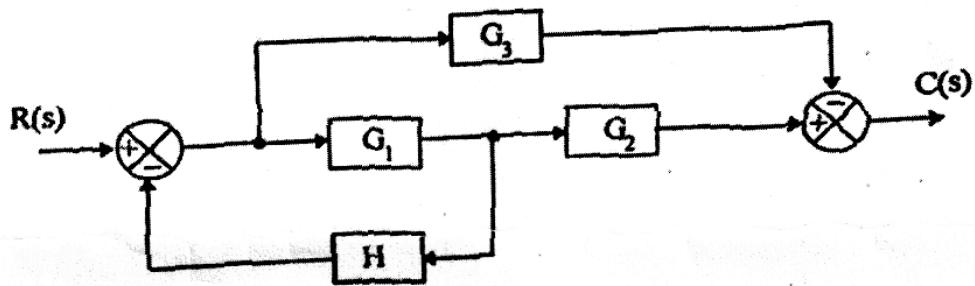


5. Derive the expression for gain of Non-Inverting OPAMP.
6. Explain QPSK. Draw the constellation diagram of QPSK.
7. What is a matched filter receiver? write down its impulse response.
8. List out important properties of Gaussian random process.
9. What impedances are represented by the points P.O. and Ron the following 'Smith' chart?



10. Explain difference between RF circulator and isolator.
11. What is dominant mode of a waveguide? Mention dominant mode for rectangular waveguide.
12. Briefly outline a scheme by which DSB-SC signal can be generated.

13. Find the transfer function $C(s)/R(s)$ of the system shown in the figure.



14. What is Routh Hurwitz Stability Criterion?

15. Briefly explain the operation of EDFA.

_____ (10 × 5 = 50 Marks)