

Seat No.	
-------------	--

**M.Phil./Ph.D. Entrance Examination, September - 2019**  
**ELECTRONICS ENGINEERING**

Day and Date : Friday, 20 - 09 - 2019  
Time : 4.00 p.m. to 6.00 p.m.

Total Marks : 100

- Instructions :
- 1) All questions are compulsory.
  - 2) Each question carries 2 marks.
  - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
  - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR Answer Sheet.
  - 5) Follow the instructions given on OMR Sheet.
  - 6) Rough work shall be done on the sheet provided at the end of question paper.
  - 7) Only non programmable calculators are allowed.

**RESEARCH METHODOLOGY**

- 1) Which of the following is the most common example of a situation for which the main parameter of interest is a population proportion?
  - A) A binomial experiment
  - B) A normal experiment
  - C) A randomized experiment
  - D) An observational study
  
- 2) Which of the following is an example of a binomial random variable?
  - A) The number of games your favourite baseball team will win this coming season.
  - B) The number of questions you would get correct on a multiple-choice test if you randomly guessed on all questions.
  - C) The number of siblings a randomly selected student has.
  - D) The number of coins a randomly selected student is carrying.

***P.T.O.***

- 3) The null and alternative hypotheses divide all possibilities into :
- A) two sets that overlap
  - B) two non-overlapping sets
  - C) two sets that may or may not overlap
  - D) as many sets as necessary to cover all possibilities
- 4) A type II error occurs when:
- A) the null hypothesis is incorrectly accepted when it is false
  - B) the null hypothesis is incorrectly rejected when it is true
  - C) the sample mean differs from the population mean
  - D) the test is biased
- 5) Of type I and type II error, which is traditionally regarded as more serious?
- A) Type I
  - B) Type II
  - C) They are equally serious
  - D) Neither is serious
- 6) The ANOVA test is based on which assumptions?
- I) the sample are randomly selected
  - II) the population variances are all equal to some common variance
  - III) the populations are normally distributed
  - IV) the populations are statistically significant
- A) All of the above
  - B) II and III only
  - C) I, II, and III only
  - D) I and III only



- 12) Which one of the following sets is the measure of central tendency?
- A) Mean, standard deviation, mode
  - B) Mean, median, standard deviation
  - C) Arithmetic mean, median, mode
  - D) Standard deviation, internal validity, mode
- 13) Hypothesis test may also be called as:
- A) Informal test
  - B) Significance test
  - C) Moderating test
  - D) T-test
- 14) Field study is related to
- A) real life situations
  - B) experimental situations
  - C) laboratory situations
  - D) none of the above
- 15) The data of research is \_\_\_\_\_.
- A) Qualitative only
  - B) Quantitative only
  - C) Both (A) and (B)
  - D) Neither (A) nor (B)
- 16) Type-I Error occurs if \_\_\_\_\_.
- A) the null hypothesis is rejected even though it is true
  - B) the null hypothesis is accepted even though it is false
  - C) both the null hypothesis as well as alternative hypothesis are rejected
  - D) none of the above

## M/P ENT - 39

- 17) A reasoning where we start with certain particular statements and conclude with a universal statement is called
- A) Deductive Reasoning                      B) Inductive Reasoning  
C) Abnormal Reasoning                      D) Transcendental Reasoning
- 18) The essential qualities of a researcher are
- A) Spirit of free enquiry  
B) Reliance on observation and evidence  
C) Systematization or theorizing of knowledge  
D) All the above
- 19) Conference proceedings are considered as \_\_\_\_\_ documents.
- A) Conventional                      B) Primary  
C) Secondary                      D) Tertiary
- 20) Questionnaire is a :
- A) Research method                      B) Measurement technique  
C) Tool for data collection                      D) Data analysis technique
- 21) Which of the following is not covered under Intellectual Property Rights?
- A) Copyrights                      B) Patents  
C) Trade Marks                      D) Thesaurus

## M/P ENT - 39

- 22) A null hypothesis can only be rejected at the 5% significance level if and only if:
- A) a 95% confidence interval includes the hypothesized value of the parameter
  - B) a 95% confidence interval does not include the hypothesized value of the parameter
  - C) the null hypothesis is void
  - D) the null hypotheses includes sampling error
- 23) Typically one-way ANOVA is used in which of the following situations?
- I) there are several distinct populations
  - II) there are two sample populations over 4000
  - III) randomized experiments
  - IV) randomly selected populations
- A) All of the above                      B) II and III only  
C) I, II and III only                      D) I and III only
- 24) A type I error occurs when:
- A) the null hypothesis is incorrectly accepted when it is false
  - B) the null hypothesis is incorrectly rejected when it is true
  - C) the sample mean differs from the population mean
  - D) the test is biased
- 25) The chi-square goodness-of-fit test can be used to test for :
- A) significance of sample statistics
  - B) difference between population means
  - C) normality
  - D) probability



## M/P ENT - 39

- 31) In IC technology, dry oxidation (using dry oxygen) as compared to wet oxidation (using steam or water vapour) produces
- A) superior quality oxide with a higher growth rate
  - B) inferior quality oxide with a higher growth rate
  - C) inferior quality oxide with a lower growth rate
  - D) superior quality oxide with a lower growth rate
- 32) In a MOSFET operating in the saturation region, the channel length modulation effect causes
- A) an increase in the gate-source capacitance
  - B) a decrease in the Transconductance
  - C) a decrease in the unity-gain cut-off frequency
  - D) a decrease in the output resistance
- 33) A source  $V_s(t) = V\cos 100\pi t$  has an internal impedance of  $(4 + j3)\Omega$ . If a purely resistive load connected to this source has to extract the maximum power out of the source, its value in  $\Omega$  should be
- A) 3
  - B) 4
  - C) 5
  - D) 7
- 34) The impulse response of a continuous time system is given by  $h(t) = \delta(t - 1) + \delta(t - 3)$ . The value of the step response at  $t = 2$  is
- A) 0
  - B) 1
  - C) 2
  - D) 3
- 35) Which special type of diode is capable of both amplification and oscillation
- A) Point contact diode
  - B) Zener diode
  - C) Tunnel diode
  - D) Junctions diodes



## M/P ENT - 39

- 36) Which of the following is a type of error associated with digital - to - analog converters (DACs)?
- A) nonmonotonic error
  - B) incorrect output codes
  - C) offset error
  - D) nonmonotonic and offset error
- 37) Which resistive component is designed to be temperature sensitive?
- A) Thermistor
  - B) Rheostat
  - C) Potentiometer
  - D) Photoconductive cell
- 38) If series current doubles, then :
- A) resistance is halved
  - B) voltage is doubled
  - C) voltage is reduced
  - D) resistance is doubled
- 39) The voltage across any branch of a parallel circuit :
- A) varies as the total current varies
  - B) is inversely proportional to total circuit resistance
  - C) is equally applied to all branch conductance's
  - D) is dropped in proportion to each branch resistance
- 40) The common-mode voltage gain is:
- A) smaller than differential voltage gain
  - B) equal to voltage gain
  - C) greater than differential voltage gain
  - D) None of the above
- 41) In a PLL, to obtain lock, the signal frequency must :
- A) come within the lock range
  - B) be less than the capture frequency
  - C) come within the capture range
  - D) be greater than the capture frequency

- 42) Once a PAL has been programmed:
- A) It cannot be reprogrammed
  - B) Its outputs are only active HIGHS
  - C) Its outputs are only active LOWs
  - D) Its logic capacity is lost
- 43) What is the resolution of a digital-to-analog converter (DAC)?
- A) It is the comparison between the actual output of the converter and its expected output.
  - B) It is the deviation between the ideal straight-line output and the actual output of the converter.
  - C) It is the smallest analog output change that can occur as a result of an increment in the digital input.
  - D) It is its ability to resolve between forward and reverse steps when sequenced over its entire range.
- 44) A basic multiplexer principle can be demonstrated through the use of a :
- A) Single-pole relay
  - B) DPDT switch
  - C) Rotary switch
  - D) Linear stepper
- 45) Which of the following memories uses a MOSFET and a capacitor as its memory cell?
- A) SRAM
  - B) DRAM
  - C) ROM
  - D) DROM
- 46) In a parallel RLC circuit, which value may always be used as a vector reference?
- A) Current
  - B) Reactance
  - C) Resistance
  - D) Voltage

## M/P ENT - 39

- 47) When a full band of frequencies is allowed to pass through a filter circuit to the output, the resonant circuit is called :
- A) low-pass filter
  - B) high-pass filter
  - C) band-stop filter
  - D) bandpass filter
- 48) Sample-and-hold circuits in ADCs are designed to :
- A) sample and hold the output of the binary counter during the conversion process
  - B) stabilize the ADCs threshold voltage during the conversion process
  - C) stabilize the input analog signal during the conversion process
  - D) sample and hold the ADC staircase waveform during the conversion process
- 49) The fast carry or look-ahead carry circuits found in most 4-bit parallel-adder circuits :
- A) increase ripple delay
  - B) add a 1 to complemented inputs
  - C) reduce propagation delay
  - D) determine sign and magnitude
- 50) As frequency increases
- A) both series and parallel RC impedance decrease
  - B) series RC impedance decreases and parallel RC impedance increases
  - C) series RC impedance increases and parallel RC impedance decreases
  - D) both series and parallel RC impedance increase



**Rough Work**