Department of Electrical Engineering

PhD EE Admission Test: Sample

Max Time: 2Hrs   **Total Questions: 100**

Passing Marks : 70%   **Color: Blue**

Brief Instructions to Candidates

1. **Anyone who will violates any of the following instructions will be immediately disqualified**
2. Please ensure that you do not have calculator, any item or information with you in the examination hall. Your mobile phone must be switched off and in your pocket.
3. After the paper is distributed, you are not supposed to look around, whisper, borrow or lending anything from any one.
4. Nobody will leave before half time.
5. There are total of **100** questions and total time is **120** minutes.
6. You will get **one** mark for each correct answer and **zero** mark for incorrect answer. Selection of more than one choice will give you zero mark.
7. Once time is over, put down your pens and put the answer sheets inside the question papers
   Filling In The Answer Sheets

8. **Your answer sheet will be checked by machine. If you do not comply with the instruction, your answers will not be graded correctly.**
9. **Carefully fill your particulars, in case of error your answer sheet will not be accepted by machine.**
10. **Carefully handle the answer sheet, you will not be provided new one.**
11. On the front side of the answer sheet find the space for your name and roll number.
12. Sign the sheet on back side.
13. On the front of the answer sheet, every entry by you will require selecting one circle out of many. Mark the correct one by COMPLETELY filling in the circle representing it. Ink should not spread outside the boundary line of the circle.
14. Circle the colour of your booklet next to your name ON THE FRONTSIDE of your answer sheet.
15. If you fill in the wrong colour, the machine reader may fail you.
16. You can do rough work inside the question booklet wherever you like.
17. After the paper is collected, keep sitting to fill in and sign your attendance sheet which will be circulated.
18. All students must fill and sign their attendance sheet else they will be eliminated from the Admission test.
19. If you violate any instruction, your paper will be cancelled and admission refused.
20. Do not open the next page of the question booklet until you are told.

Read the following Passage carefully and answer the questions given at its end. Q (1-5)

For many centuries, humankind was unable to study certain data contained in the verses of the Qur'an because they did not possess sufficient scientific means. It is only today that numerous verses of the Qur'an dealing with natural phenomena have become comprehensible. A reading of old commentaries on the Qur'an, however knowledgeable their authors may have been in their day, bears solemn witness to a total inability to grasp the depth of meaning in such verses. I could even go so far as to say that, in the 20th century, with its compartmentalization of ever-increasing knowledge, it is still not easy for the average scientist to understand everything he reads in the Qur'an on such subjects, without having recourse to specialized research. This means that to understand all such verses of the Qur'an, one is nowadays required to have an absolutely encyclopedic knowledge embracing many scientific disciplines.

1. The main point from the author's view is that

    (A) Qur'an does not give any scientific views.
    (B) Qur'an only gives directions related to worship.
    (C) Man's soul and spirit already know explanations of verses of Qur'an.
    (D) Knowledge about many scientific disciplines is required to understand whole Qur'an.

2. The phrase ' in the 20th century, with its compartmentalization of ever-increasing knowledge, it is still not easy for the average scientist to understand everything he reads in the Qur'an ' in the passage means
    (A) It is better to have scientific knowledge to understand the Qur'an.
    (B) Muslims did not try to understand Qur'an.
    (C) Qur'an is difficult to understand.
    (D) Qur'an is a book of science.

3. In the author's opinion
    (A) Mankind can find new ways by applying Qur'an in daily life.
    (B) We should only recite Qur'an and not understand it.
    (C) Mankind is heading towards complete destruction.
    (D) It is only today that numerous verses of the Qur'an dealing with natural phenomena have become comprehensible.

4. For many centuries, humankind was unable to study certain data contained in the verses of the Qur'an because

    (A) It is difficult to understand Qur'an
    (B) Sufficient scientific means were not present
    (C) The certain data was not available
    (D) Humankind did not want to study them

5. A suitable title for the above passage is

(A) Qur'an: a book of science.
(B) Qur'an: a book for recitation.
(C) Qur'an: a book of miracle.
(D) Qur'an: the great book.

Each of the questions below consists of a word in capital letters, followed by five letter words (A, B, C, D, E). Choose the lettered word that is most nearly <u>opposite</u> in meaning to the word in capital letters and write the letter of your choice on your answer sheet.

Q (6-10)

6. ENORMOUS

   (A) Soft
   (B) Average
   (C) Tiny
   (D) Weak
   (E) Fragile

7. ot be _____ as being either very shy or over confident.

   (A) categorized

   (B) instructed

   (C) intoned

   (D) distracted

   (E) refrained

8. We never believed that he would resort to _____ in order to achieve his goal; we always regarded him as a _____ man.

   (A) charm - insincere

   (B) necromancy - pietistic

   (C) logic - honorable

   (D) prestidigitation - articulate

   (E) subterfuge - honest

9. The recent worldwide increase in oil prices has led to a _____ demand for electric vehicles.

(A) greater

(B) greatest

(C) greatly

(D) greatness

(E) None of the above

10. Maria has a wide range of experience,_____worked in technical, production and marketing positions.

(A) having

(B) has

(C) having had

(D) had

(E) had been

11. Tickets will not be redeemable for cash or credit at any time, _____Will they be replaced if lost or stolen.

(A) but

(B) though

(C) only

(D) nor

(E) so

12. James asked me ___ him..

(A) emailing

(B) to email

(C) email

(D) emailed

(E) mail

13. The organizers of the trip reminded participants to ------- at the steps of the city hall at 2:00 P.M.

(A) see

(B) combine

(C) meet

(D) go

(E) wait

14. When he came to Japan 20 years ago, he had no ………. That he was going to end up living in Japan for so long.

(A) choice

(B) reason

(C) matter

(D) idea

(E) None of the above

15.   ……………. being diagnosed with cancer, he did not give up his dream.

(A) Instead of

(B) Although

(C) Because of

(D) Despite

(E) None of the above

16. The financial audit of Soft Peach Software ------- completed on Wednesday by a certified accounting firm.

(A) to be

(B) having been

(C) was

(D) were

(E) have to be

Each question below consists of a related pairs of words or phrases, followed by five lettered pairs of words or phrases; select the lettered pair that best expresses a relationship similar to that expressed in the original pair.

Q (26-30)

17. WALK : LEGS

(A) gleam : eyes

(B) chew : mouth

(C) dress : hem

(D) cover : book

(E) grind : nose

18. CHRONOLOGICAL : TIME

(A) virtual: truth

(B) abnormal: value

(C) marginal: knowledge

(D) ordinal: place

(E) coincidental: health

19. MASSIVE : BULK

(A) Ultimate : magnitude

(B) trivial : importance

(C) anonymous : luster

(D) interminable : legacy

(E) gigantic : size

20. HOSPITABLE : COURTESY

(A) morbid: cheerfulness

(B) vindictive: spite

(C) leisurely: haste

(D) infamous: honor

(E) despondent: glee

21. REINFORCE : STRONGER

(A) abound: lesser

(B) dismantle: longer

(C) wilt: higher

(D) shirk: greater

(E) erode: weaker

31. SR latch consists of

    (A) 1 input
    (B) 2 inputs
    (C) 3 inputs
    (D) 4 inputs

32. Which of following gate is represented by $x+y=z$?
    (A) NOR gate
    (B) OR gate
    (C) NOT gate
    (D) XOR gate

33. Transference of information from one register to another is
    (A) Intra-register transfer operation
    (B) Inter-register transfer operation
    (C) Out register transfer operation
    (D) In register transfer operation

34. NOR function is dual of

    (A) AND function
    (B) OR function
    (C) XOR function
    (D) NAND function

35. One that is not type of flip-flop is
    (A) JK
    (B) T
    (C) RS
    (D) UT

36. The output of the feedback control system must be a function of

    (A) Reference input
    (B) Reference output
    (C) Output and feedback signal
    (D) Input and feedback signal

37. Which among the following is not an advantage of an open loop system?

    (A) Simplicity in construction & design
    (B) Easy maintenance
    (C) Rare problems of stability

(D) Requirement of system recalibration from time to time

38. The computer architecture aimed at reducing the time of execution of instructions is _____

(A) CISC

(B) RISC

(C) ISA

(D) ANNA

39. If $x = -1$, then what is the value of the function $f(x) = x^3 + 4x + 12$

(A) 7

(B) 9

(C) 11

(D) 13

40. Power transformers should be designed to have maximum efficiency

(A) at one-fourth load

(B) at one-half load

(C) at or near full load

(D) any of the above

41. The transformer noise is mainly because of

(A) cooling oil

(B) sinusoidal current

(C) magnetic flux

(D) all of the above.

42. The induced e.m.f. in the transformer secondary will depend on

(A) Frequently of the supply only.

(B) Number of turns in secondary only.

(C) Maximum flux in core and frequency only.

(D) Frequency, flux and number of turns in the secondary.

43. Two numbers are respectively 10% and 20% more than a third number. The ratio of the two numbers is ?

(A) 11:12

(B) 12:13

(C) 4:5

(D) 9:10

44. The Fleming left-hand rule is applicable to

(A) generator

(B) motor

(C) transformer

(D) (a) and (b) both

45. The speed of d.c. series motor at no load is

(A) zero
(B) 1500 r.p.m.
(C) Infinity
(D) 3000 r.p.m.

46. The function of the commutator in a d.c. machine is
(A) to change alternating current to a direct current
(B) to improve commutation
(C) for easy control
(D) to change alternating voltage to direct voltage

47. The direction of rotation of a d.c. series motor can be changed

(A) by interchanging supply terminals

(B) by interchanging field terminals

(C) either (a) or (b)

none of above

48. The resistance of a parallel circuit consisting of two resistors is 12 ohms. One of the resistance wires breaks and the effective resistance becomes 18 ohms. The resistance of the broken wire is

(A) 48 ohms
(B) 18 ohms
(C) 36 ohms
(D) 24 ohms

49. The time period of an alternating quantity is 0.02 second. Its frequency will be

(A) 25 Hz
(B) 50 Hz
(C) 100 Hz
(D) 0.02 Hz

50. A sine wave has a frequency of 50Hz. Its angular frequency will be

(A) $(50 / \pi)$ radians / sec
(B) 50π radians / sec
(C) 100π radians / sec
(D) $(100 / \pi)$ radians / sec

51. If an alternating triangular voltage is applied to a resistor the shape of the current waveform will be

(A) Triangular waveform
(B) Saw tooth waveform
(C) sinusoidal waveform
(D) square waveform

52. An instantaneous change in voltage is not possible in

(A) a resistor
(B) an inductor
(C) a capacitor
(D) a current source

53. In a resistor R, power P equals

(A) vi
(B) $i^2 v$
(C) iR
(D) iR^2

54. The voltage v across an inductor L carrying current I equals

(A) Li
(B) Li^2
(C) $L \, di/dt$
(D) $L \int i dt$

(E) circuit

(F) changes in the stored energy in inductors and capacitors

55. Energy stored in a capacitor over a cycle, when excited by an a.c. source is

(A) the same as that due to a d.c. source of equivalent magnitude

(B) half of that due to a d.c. source of equivalent magnitude

(C) zero

(D) none of the above

56. Which of the following transformers will be largest in size

(A) 1 kVA, 50 Hz

(B) 1 kVA, 60 Hz

(C) 1 kVA, 100 Hz

(D) 1 kVA, 500 Hz

57. The energy required to liberate an electron from an atom is called

(A) Kinetic energy

(B) Potential energy

(C) Excitation energy

(D) Ionization energy

58. In n-type semiconductor

(A) $n = p$

(B) $p < n$

(C) $p \ll n$

(D) $p \gg n$

59. In p-type semiconductor

(A) holes form the minority carrier

(B) free electrons form the minority carriers

(C) hole density equals free electron density

(D) impurity is pentavalent

60. The resistance of a reverse biased ideal diode is

(A) zero

(B) low

(C) negative

(D) infinity

61. n a symbol of transistor, the sign of arrow shows

(A) emitter

(B) base

(C) collector

(D) base and collector both

62. A FET consists of

(A) a source and a gate
(B) a source, gate and a drain
(C) a source and a drain
(D) a gate and a drain

63. Improper biasing of transistor results in

(A) distortion in output signal
(B) excessive heating at collector terminal
(C) heavy loading of emitter terminal
(D) all of above

64. The input impedance of the operational amplifier is

(A) infinite
(B) zero
(C) very high but not infinite
(D) very small

65. What are Prime Numbers?

(A) Which can be divided by Odd Number
(B) Which can be divided by Even Numbers
(C) Which can be divided by Number 1 & by itself Number
(D) Which can be divided by any Number

66. The internal Components of the processor are connected by _____

(A) Processor intra-connectivity circuitry
(B) Processor bus
(C) Memory bus
(D) Ram bus

67. Within a software program subroutine nesting means,

(A) Having multiple subroutines in a program
(B) Using a linking nest statement to put many sub routines under the same name
(C) Having one routine call the other
(D) None of the mentioned

68. ____ converts the programs written in assembly language into machine instructions.

(A) Machine compiler
(B) Interpreter
(C) Assembler
(D) Converter

69. The BOOT sector files of the system are stored in _____

(A) Harddisk
(B) ROM
(C) RAM

(D) Fast solid state chips in the motherboard

70. Root locus specifies the movement of closed loop poles especially when the gain of system
    (A) Remains constant
    (B) Exhibit variations
    (C) Gives zero feedback
    (D) Gives infinite pole

71. In regenerating the feedback, the transfer function is given by
    (A) C(s)/R(s)=G(s)/1+G(s)H(s)
    (B) C(s)/R(s)=G(s)H(s)/1/G(s)H(s)
    (C) C(s)/R(s)=G(s)/1xG(s)H(s)
    (D) C(s)/R(s)=G(s)/1-G(s)H(s)

72. Multiplication of two matrices is defined if and only if number of columns of left matrix is same as number of
    (A) left matrix row
    (B) right matrix row
    (C) left matrix column
    (D) right matrix column

73. Vector which contains scalar that have eigenvalues is called
    (A) Eigen vector
    (B) scalar vector
    (C) point vector
    (D) unit vector

74. $Log_2 16$ is equals to
    (A) 4
    (B) 8
    (C) 12
    (D) 16

75. Two 100W, 200 V lamps are connected in series across a 200 V supply. The total power consumed by each lamp will be _____ watts.
    (A) 25
    (B) 50
    (C) 100
    (D) 200

76. A short circuit is that which
    (A) Uses short pieces of wire
    (B) Goes only a short distance
    (C) All elements connected in series
    (D) Offers very low resistance path for current to flow

77. Which of the following stays the same in all parts of a series circuit?
    (A) Voltage
    (B) Power
    (C) Resistance
    (D) current

78. Ohms law is applicable to
  (A) inductors
  (B) capacitors
  (C) resistors
  (D) all of the above