ENTRANCE TEST FOR ADMISSION TO M.Phil / Ph.D (Full Time/Part Time) PROGRAMMES, 2020-2021

<u>SECOND PART</u>

Question Paper Code/Subject :

Time: One hour   Maximum : 50 marks

51) Two variables will be represented by

a)   Eight minterms   c)   Six minterms

b)   Five minterms   d)   Four minterms

52) Output of AND gate in sum of product (SOP) is connected to

a)   NOT   c)   OR

b)   AND   d)   XOR

53) NOR function is dual of …….

a)   AND   c)   OR

b)   NAND   d)   XOR

54) Half adder circuits require

a)   Inputs   c)   Digits

b)   Outputs   d)   Both (a) and (b)

55) Binary decoders are also called as

a)   n to 2^n line decoder   c)   n+1 to 2^n line decoder

b)   n to 2^{n+1} line decoder   d)   None of the above

56) How is the decimal number 10011 represented in BCD?

a)   (1011)(0011)   c)   (0011)(1001)

b)   (1011)(1001)   d)   (0001)(1001)

57) Memory elements in clocked sequential circuits are called

a) Latches

c) Flip flops

b) Signals

d) Gate

58) State of flip-flop can be switched by changing its

a) Input signal

b) Momentary signal

c) Output signal

d) All signal

59) A decimal counter has ……………… states

a) 5

c) 15

b) 10

d) 20

60) Three decade counter would have

a) 1 BCD counter

b) 2 BCD counters

c) 3 BCD counters

d) 4 BCD counters

61) Global warming is mainly caused due to

a) Emission of heat from engines

b) Emission of CO_2 due to burning of fossil fuels

c) Use of nuclear energy

d) Air pollution

62) Cogeneration means

a) Power production using binary cycle

b) Power production using two types of primary energy sources

c) Generation of ac as well as dc powers in the same installation

d)   Generation of electricity and heat in a single installation

63) What is the standard value of solar constant?

a)   1 KWm^2

b)   1.367 KWm^2

c)   1.5 KWm^2

d)   5 KWm^2

64) The value of concentration ratio of flat-plate collector is:

a)   1

b)   0

c)   100

d)   1000

65) The range of wind speed suitable for wind power generator is

a)   0 to 5 m/s

b)   5 to 25 m/s

c)   25 to 50 m/s

d)   50 to 75 m/s

66) The maximum axial thrust occurs when interference factor a is

a)   0

b)   0.33

c)   0.5

d)   1.0

67) Biodiesel is

a)   Obtained from fermentation of sugars

b)   Obtained from pyrolysis process

c)   Exudates of plants

d)   An upgraded vegetable oil

68) The water content in anhydrous ethanol is

a)   20 %

b)   10 %

c)   5 %

d)   0.7 %

69) Radioactive pollutants like- Sr-90 generally

a)   Deposited in livers

b)   Deposited in bones

c)   Deposited in lungs

d)   Deposited in blood vessels

70) The effect of in organic chemical in water pollution leads to

a)   Skin cancer

b)   Birth defects

c)   Genetic mutations

d)   Excessive growth of algae

71) Cauchy-Riemann equations are

 (a) $u_x=v_y$ and $u_y=-v_x$

 (b) $u_x=v_y$ and $u_y=v_x$

 (c) $u_x=-v_y$ and $u_y=-v_x$

 (d) $u_y=-v_y$ and $u_x=v_x$

72)   If   f(z)=u±iv   in   polar   form   is   analytic   then $\partial u/\partial r$ is

(a) $\partial v/\partial \theta$

(b) r $\partial v/\partial \theta$

(c) $(1/r)\ (\partial v/\partial \theta)$

(d) $-\partial v/\partial \theta$

73) The residue of f(z)=cot(z) at each poles is

(a) 0

(b) 1

(c) 1/2

(d) None

74) If f(a)=0 and f'(a)≠0, then z=a is called a …..

(a) Simple zero

(b) Simple curve

(c) Zero of order n

(d) None

75) Rank of covariant tensor $g_{\mu v}$ is

(a) 1

(b) 2

(c) 3

(d) 4

76) The $g_v{}^\mu$ is a ……………….. tensor

(a) Covariant

(b) Contravariant

(c) Conjugate

(d) Mixed

77) If a, b are elements of a group G, then $(ba)^{-1}$ =

(a) $a^{-1}b^{-1}$

(b) $b^{-1}a^{-1}$

(c) $a^{-1}b$

(d) ab^{-1}

78) A monoid is always a

(a) A group

(b) A commutative group

(c) Non abelian group

(d) Semi group

79) If two events are independent, then

(a) They must be mutually exclusive

(b) The sum of their probabilities must be equal to one

(c) Their intersection must be zero

(d) None of these alternatives is correct

80) A numerical description of the outcome of an experiment is called a

(a) Descriptive statistic

(b) Probability function

(c) Variance

(d) Random variables

81) The lines of force due to a charged particle is

a)   Always straight

c)   Sometimes straight

b)   Sometimes curved

d)   Always curved

82) In uniform fields, all points have …………… filed strength

a)   Zero

c)   Same

b)   Infinite

d)   Different

83) The inductance is the measure of…….

a)   Electric charge stored

c)   Magnetic field stored

b)   Emf generated by coil

d)   Magnetic dipole measurement

84) What is the strength of magnetic field is known as…….

a)   Flux

c)   Density

b)   Magnetic density

d)   Magnetic flux density

85) In which of the following forms can Maxwell's equation not be represented?

a)   Static

c)   Differential

b)   Integral

d)   Harmonic

86) The continuity equation is a combination of which of the two laws

a)   Ohm's law and Gauss law

c)   Ohm's law and Ampere's law

b)   Maxwell's law and Ampere's law

d)   Ampere's law and Gauss law

87) Among the following four, the highest wavelength is of………

a)   Infrared

c)   Radio waves

b)   Ultraviolet

d)   Gamma rays

88) Electromagnetic spectrum comprises

a)   Transverse waves

b)   Both transverse and longitudinal

c)   Longitudinal waves

d)   Latitudinal waves

89) Emissivity of perfectly black body is

a)   0

c)   5

b)   1

d)   2

90) The number of modes is given as 50, find the V number

a)   50

c)   10

b)   5

d)   100

91) What is the wavelength band for solar radiation?

a) 10^{-1} to 10 micron meter

c) 10^{-1} to 1 micron meter

b) 10^{-1} to 2 micron meter

d) 10^{-1} to 3 micron meter

92) In what form is solar energy is radiated from the sun?

a)   UV waves

c)   Electromagnetic waves

b)   IR rays

d)   Micro waves

93) On which factor does the average kinetic energy of gas molecules depend?

a)   Nature of the gas

b)   Temperature

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c)   Volume

d)   Mass

94) A gas behaves as an ideal gas at

a)   Low pressure and low temperature

c)   High pressure and low temperature

b)   High pressure and high temperature

d)   Low pressure and high temperature

95) Which of the following represents the energy in storage?

a)   Internal energy

c)   Heat

b)   Work

d)   None of the above

96) The temperature at which conductivity of a material becomes infinite is called

a)   Mean temperature

c)   Absolute temperature

b)   Crystallization temperature

d)   Critical temperature

97) The velocity of a particle moving with simple harmonic motion is . . . . at the mean position

a)   Minimum

c)   Maximum

b)   Zero

d)   None of the above

98) The loudness and pitch of a sound note depends on

a)   Intensity and frequency

b)   Frequency and velocity

c)   Intensity and velocity

d)   Velocity

99) A closed organ pipe and an open pipe of the same length produce four beats per second, when sounded together. If the length of the closed pipe is increased, then the number of beats will

a)   Decrease

c)   Remain the same

b)   Increase

d)   Remains different

100) Piezoelectric crystals…….

a)   Float in water

b)   Are not soluble in water

c)   Dissolve in water

d)   Absorbs water

Physics

Answer key

51. D   52.C   53.B   54.D   55.A   56.D   57.C   58.A   59.B   60.C   61.B   62.D

63. B   64.A   65.B   66.C   67.D   68.D   69.B   70.A   71. A   72. C   73.B   74.A

75.B   76.D   77.A   78.D   79.B   80.D   81.D   82.C   83.B   84.D   85.A   86.D

87. C   88.A   89.C   90.C   91.D   92.C   93.B   94.D   95.A   96.D   97.C   98.A

99. B   100.C