61712

ROLL No. | | | | | |

TEST BOOKLET No. 095

TEST FOR POST GRADUATE PROGRAMMES

INSTRUMENTATION

Time: 2 Hours

Maximum Marks: 450

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.

2. Write your Roll Number in the space provided on the top of **this page**.

3. Also write your Roll Number, Test Code, and Test Subject in the columns provided for the same on the **Answer Sheet**. Darken the appropriate bubbles with a **Ball Point Pen.**

4. The paper consists of 150 objective type questions. All questions carry equal marks.

5. Each question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble fully by a **Ball Point Pen** corresponding to the correct response as indicated in the example shown on the Answer Sheet.

6. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.

7. Please do your rough work only on the space provided for it at the end of this Test Booklet.

8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.

9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of such unforeseen happenings the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.

SEAL

INSTRUMENTATION

1. Which one of the following logic gates is similar to the function of two switches in series?

(A) OR
(B) Exclusive OR
(C) NOR
(D) AND

2. Compared with CMOS devices, the TTL devices have

(A) high power consumption
(B) low power consumption
(C) low speed operation
(D) None of the above

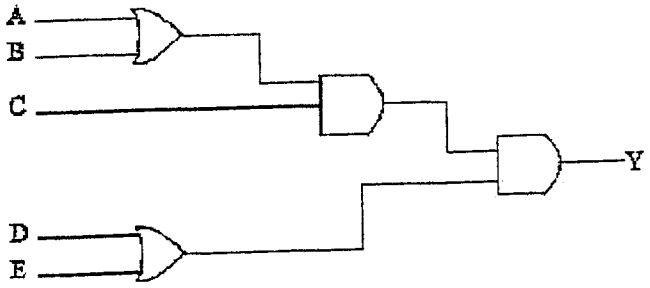
3. Two 4-bit binary numbers '1000' and '0100' are multiplied. What is the decimal value of the result?

(A) 1000
(B) 100
(C) 32
(D) None of the above

4. The hexadecimal value of the binary number '0100 0010' is

(A) 66
(B) 42
(C) 24
(D) None of the above

5. Consider the logic circuit diagram given below.



The output 'Y' is given as

(A) (AB + C) . D.E
(B) (A+B).C.(D+E)
(C) (A+B).C.(D+E)#
(D) (A.B+C)+D.E

Note: The '#' symbol indicates a bar over the previous term

6. If an input of a TTL OR gate is left unconnected, what would be the output?

(A) High
(B) Low
(C) May be high or low
(D) High impedance state

7. The width of address bus in 8086 microprocessor is

(A) 8-bit
(B) 16-bit
(C) 20-bit
(D) 24-bit

8. Which one of the following programmable logic devices have programmable AND and programmable OR matrices?

(A) ROM
(B) PAL
(C) PLA
(D) None of the above

9. Compared with static RAM, the dynamic RAM devices

(A) are slow
(B) have low packing density
(C) are expensive
(D) do not require refresh

10. Flash memory is

(A) ROM
(B) EPROM
(C) EEPROM
(D) RAM

11. Identify the three to eight decoders in the following

(A) 74LS244
(B) 74LS245
(C) 74LS139
(D) 74LS138

12. Data bus lines of the microprocessor are

(A) input lines
(B) output lines
(C) bidirectional lines
(D) None of the above

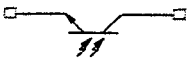
13. In assembly language programming, the memory space allocated for a variable by assembler directive 'DB' definition is

(A) one byte
(B) two bytes
(C) four bytes
(D) eight bytes

14. How many discrete levels of analog voltages are generated by a 4-bit voltage output DAC?

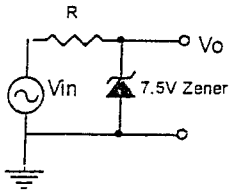
(A) 4
(B) 16
(C) 64
(D) 256

15. The following symbol refers to



(A) phototransistor
(B) photodiode
(C) LED
(D) opto-coupler

16. The output voltage Vo in the following circuit (assume ideal Zener diode)



(A) can vary between -7.5V and -15V
(B) can vary between 0V and +7.5V
(C) can vary between +7.5V and +15V
(D) always zero

17. Which of the following is the characteristic of ideal operational amplifier?

(A) Input impedance zero
(B) Output impedance zero
(C) Bandwidth zero
(D) Gain zero

18. The IC μA741 is a

(A) digital IC
(B) timer IC
(C) operational amplifier
(D) DAC

19. Current through a p-n junction diode in reverse biased condition is due to

(A) minority carriers
(B) majority carriers
(C) both majority and minority carriers
(D) cannot be determined

20. Shielded cables generally prevents interference through

(A) capacitive coupling
(B) inductive coupling
(C) resistive coupling
(D) inductive and resistive coupling

21. Separation of AF from RF in radio communication is known as

(A) modulation
(B) mixing
(C) demodulation
(D) rectification

22. Which type of modulation is employed in TV to carry picture information?

(A) Frequency modulation
(B) Amplitude modulation
(C) Phase modulation
(D) Digital modulation

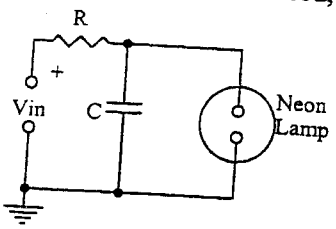
23. A low pass filter

(A) passes low frequencies
(B) passes high frequencies
(C) passes narrow band of frequencies
(D) rejects narrow band of frequencies

24. The ability of a receiver to separate two signals of closely placed frequencies is known as

(A) sensitivity
(B) S/N Ratio
(C) selectivity
(D) gain

25. In the circuit given below, the neon lamp flickers at a rate set by 'R', 'C' and 'Vin'. If 'C' is decreased, what would happen to the rate of flickering?



(A) Increase
(B) Decrease
(C) Remains same
(D) Cannot be determined

26. Radio Frequency interference in signal conditioning circuits is reduced by proper

(A) grounding technique
(B) shielding technique
(C) filtering technique
(D) None of the above

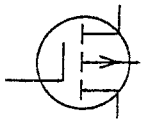
27. A fan motor is classified into which of the following types?

(A) AC induction motor
(B) DC motor
(C) Stepper motor
(D) Servo motor

28. Which of the following amplifier offers high common mode rejection?

(A) Differential amplifier
(B) Instrumentation amplifier
(C) Isolation amplifier
(D) Non-inverting amplifier

29. The following symbol refers to



(A) FET
(B) n-channel MOSFET
(C) p-channel MOSFET
(D) None of the above

30. If Black, Brown, and Yellow colour bands are seen on a resistor, the value of resistance is

(A) 1 Kohms
(B) 10 Kohms
(C) 100 Kohms
(D) 1Mohms

31. Which of the following type of ADCs require S/H amplifier?

(A) Integration type
(B) Successive approximation type
(C) Flash converter
(D) Sigma-Delta converter

32. Find current output of 4-bit DAC based on R-2R ladder network for a digital input of 1011. The ladder network has resistor values of R = 10kΩ and the reference voltage is 10V

(A) 0.5 mA
(B) 0.6875 mA
(C) 1.05 mA
(D) 1.6875 mA

33. In astable multivibrator

(A) both states are not stable
(B) one state is stable
(C) both states are stable
(D) Not determined

34. Which of the following is generally used for conditioning thermocouple signals?

(A) Inverting amplifier
(B) Instrumentation amplifier
(C) Bridge amplifier
(D) Logarithmic amplifier

35. Which of the following is used for detecting change in resistance?

(A) Filter
(B) Bridge circuit
(C) Isolator
(D) Amplifier

36. Which of the following signals of Instrumentation Amplifier ICs is given to reduce the effect of cable capacitance and leakage?

(A) Guard
(B) Sense
(C) Reference
(D) Output

37. The volume of the bulb of a liquid filled thermometer is $1000mm^3$. Its time constant and sensitivity are respectively 300 s and $3.6mm/^\circ C$. If the volume of the bulb is reduced to $500mm^3$, the sensitivity becomes

(A) $7.2mm/^\circ C$
(B) $10.8mm/^\circ C$
(C) $1.8mm/^\circ C$
(D) $0.6mm/^\circ C$

38. Identify an active sensor in the following

(A) thermocouple
(B) RTD
(C) thermistor
(D) strain gauge

39. The phase change at cut off frequency for a –20dB low-pass filter is

(A) 0° (B) – 45°
(C) +45° (D) – 90°

40. To convert a galvanometer to an ammeter,

(A) a resistance is introduced in series with the galvanometer
(B) a resistance is connected in parallel to the galvanometer
(C) a capacitance is connected in series with the galvanometer
(D) None of the above

41. What is the prime application of IC555?

(A) Timer (B) Amplifier
(C) Integrator (D) Differentiator

42. A memory device has 16 bit address bus. How many locations are there?

(A) 4K (B) 16K
(C) 64K (D) 128K

43. The Boolean expression (A# + B# + C#)# is equal to
Note: The '#' symbol indicates a bar over the previous term

(A) A.B .C (B) A + B + C
(C) A# . B# . C# (D) (A + B + C)#

44. Which one of the following gates is most suitable to check the number of ones in a digital word is even or odd?

(A) EX-OR (B) AND
(C) OR (D) NOT

45. The worst-case output voltages for logic low and logic high states of TTL devices are respectively given as

(A) 0.4 V and 2.4 V (B) 0.8 V and 2.0 V
(C) 0.0 V and 5.0 V (D) 0.4 V and 2.8 V

46. When a 50Hz sinusoidal voltage is applied to the input of a full-wave rectifier, the output frequency is

(A) 0Hz
(B) 50Hz
(C) 100Hz
(D) 200Hz

47. A diode that has a negative resistance characteristics is the

(A) Schottky diode
(B) tunnel diode
(C) laser diode
(D) hot-carrier diode

48. In a voltage divided biased npn transistor, if the lower voltage divider resistor (the one connected to ground) opens,

(A) the transistor is not affected
(B) the transistor may be driven into cut off
(C) the transistor may be driven into saturation
(D) the collector current will decrease

49. A JFET always operates with

(A) the gate-to-source pn junction reverse-biased
(B) the gate-to-source pn junction forward-biased
(C) the drain connected to ground
(D) the gate connected to source

50. Common mode gain is generally

(A) very high
(B) very low
(C) always unity
(D) None of the above

51. A freshly prepared radioactive source of half-life 2 hours emits radiation of intensity which is 64 times the permissible safe level. The minimum time after which it would be possible to work safely with the source is

(A) 6 hours
(B) 12 hours
(C) 24 hours
(D) 48 hours

52. An alpha particle and a deutron projected with equal kinetic energies describe circular paths of radii r1 and r2 respectively in a uniform magnetic field. The ratio r1/r2 is

(A) 1
(B) 2
(C) $1/(2)^{1/2}$
(D) $(2)^{1/2}$

53. The amount of heat required to raise the temperature of a unit mass of a substance by 1°K is

(A) specific heat
(B) thermal capacity
(C) calories
(D) latent heat

54. If the net force 'F' acting on an object is a non-zero constant, which of the following could also be a constant?

(A) Position
(B) Velocity
(C) Speed
(D) Acceleration

55. The unit of pressure in SI units is

(A) Pascal
(B) Fermi
(C) Joule
(D) Erg

56. At high altitudes water boils at lower temperature because of

(A) high pressure
(B) low pressure
(C) low surrounding temperature
(D) None of the above

57. The dimensional formula for density is

(A) ML^{-1}
(B) ML^{-2}
(C) ML^{-3}
(D) None of the above

58. When the velocity of a moving body is doubled, its kinetic energy

(A) is doubled
(B) becomes 3 times
(C) becomes 4 times
(D) becomes 6 times

59. If the length of a simple pendulum of period T is doubled, its time of oscillation becomes

(A) 2T
(B) T/2
(C) 4T
(D) $T2^{1/2}$

60. A body sinks in water if its density is

(A) greater than that of water
(B) less than that of water
(C) equal to that of water
(D) None of the above

61. Resolving power of the prism depends on

(A) base of the prism
(B) angle of the prism
(C) transmission of the prism
(D) angle of minimum deviation

62. Double refraction is exhibited by

(A) water
(B) NaCl
(C) calcite
(D) oxygen

63. Optical fibers employ the principle of

(A) interference
(B) diffraction
(C) refraction
(D) total internal reflection

64. Visible region in the electromagnetic spectrum is

(A) 10 to 200 nm
(B) 200 to 400 nm
(C) 400 to 800 nm
(D) 800 to 1200 nm

65. If 'f' is the frequency of a sound source observed by an observer at rest when the source is also at rest, what is the frequency 'fo' observed by an observer when moving at the speed of *vo* towards the source which is also moving towards the observer at the speed of *vs*?

(A) $f_o = f\{(v - v_o) / (v - v_s)\}$
(B) $f_o = f\{(v - v_o) / (v + v_s)\}$
(C) $f_o = f\{(v + v_o) / (v - v_s)\}$
(D) $f_o = f\{(v + v_o) / (v + v_s)\}$

66. The effect, which explains the splitting of spectral lines by external magnetic field, is

(A) Zeeman effect
(B) Stark effect
(C) Raman effect
(D) Compton effect

67. Impulse is equal to change of

(A) velocity
(B) acceleration
(C) momentum
(D) energy

68. When light falls on certain materials, it results in flow of current through the external circuit. The effect is known as

(A) Piezo resistive effect
(B) Piezo electric effect
(C) photo voltaic effect
(D) None of the above

69. A device that converts electric energy into mechanical energy is

(A) dynamo
(B) motor
(C) transformer
(D) None of the above

70. A super conducting material in the super conducting state is

(A) paramagnetic
(B) diamagnetic
(C) ferromagnetic
(D) None of the above

71. The prefix 'tera' refers to which one of the following power of 10?

(A) 10^{12}
(B) 10^{9}
(C) 10^{6}
(D) 10^{3}

72. If λ_m is the wavelength of the radiation emitted with maximum energy in the spectrum of blackbody, and T is the Kelvin temperature, then Wien's displacement law states that the wavelength λ_m is proportional to

(A) $1/T$
(B) $1/T^2$
(C) $1/T^3$
(D) $1/T^5$

73. The distance between two charges is doubled. Then the force between them becomes

(A) double
(B) same
(C) half
(D) one fourth

74. The popular Einstein's mass energy equation is

(A) $E = mc^2$
(B) $E = h\nu$
(C) $E = kT$
(D) $E = (\frac{1}{2})mv^2$

75. Thermal conductivity is low for

(A) brass
(B) wood
(C) aluminum
(D) silver

76. Frictional force acts in

(A) same direction of the motion
(B) opposite direction to the motion
(C) in all direction
(D) None of the above

77. To get a real magnified image with a convex lens, the object must be placed

(A) at f
(B) at 2f
(C) beyond 2f
(D) between f and 2f

78. The wavelength of Helium-Neon Laser beam is

(A) 632.80 nm
(B) 452.00 nm
(C) 589.00 nm
(D) 380.00 nm

79. At what temperature the density of water is the maximum?

(A) 0°C
(B) 4°C
(C) 100°C
(D) None of the above

80. Heavy water is represented by

(A) H_2O
(B) D_2O
(C) T_2O
(D) T_3O

81. For the materials having PTC (positive temperature coefficient) of resistivity, increase in temperature

(A) increases the resistivity
(B) decreases the resistivity
(C) keeps the resistivity constant
(D) the change in resistivity can not be determined

82. Four 20 μfd capacitors are connected in series. Its effective value is

(A) 10 μfd
(B) 80 μfd
(C) 40 μfd
(D) 5 μfd.

83. In a tuned LC circuit, if 'L' is decreased what would happen to the resonant frequency?

(A) Increases
(B) Decreases
(C) Remains same
(D) Cannot be determined

84. In decibels, the gain 100 is given as

(A) 10dB
(B) 20dB
(C) 30dB
(D) 40dB

85. The number of valence electrons of donor impurity atoms added for the fabrication of n-type semiconductors is

(A) 3
(B) 4
(C) 5
(D) None of the above

86. At which one of the following temperatures, the Hg becomes superconducting?

(A) 4.2°K
(B) 11.0°K
(C) 77.0°K
(D) 123.0°K

87. The forbidden energy gap in an energy band diagram is '0eV' for

(A) insulator
(B) semiconductor
(C) conductor
(D) None of the above

88. Which of the following gauges measures absolute pressure in the range 10 to 10^{-6} torr?

(A) Pirani gauge
(B) Penning gauge
(C) Hot-cathode ionization gauge
(D) McLeod gauge

89. Which of the following motors uses brushes?

(A) AC induction motor
(B) DC motor
(C) Stepper motor
(D) Servo motor

90. A 300 Hz sine wave is sampled at 500 Hz. What is the aliased frequency?

(A) 800 Hz
(B) 250 Hz
(C) 200 Hz
(D) 300 Hz

91. Anti-aliasing filter is a

(A) low-pass filter
(B) high-pass filter
(C) band-pass filter
(D) notch filter

92. Which of the following display systems requires back light for displaying the images?

(A) LED
(B) LCD
(C) CRT
(D) None of the above

93. Which of the following signals controls the intensity of the electron beam and produces an image on the CRT screen?

(A) video signal
(B) horizontal sweep
(C) vertical sweep
(D) None of the above

94. How many wires are there in a USB cable?

(A) 4
(B) 9
(C) 15
(D) 25

95. The transfer function is defined as the Laplace Transform of the response for a

(A) step input
(B) impulse input
(C) ramp input
(D) parabolic input

96. The viscous friction force is approximately linearly proportional to

(A) displacement
(B) velocity
(C) acceleration
(D) None of the above

97. In signal flow graph, a node which has only outgoing branches is called

(A) an input node
(B) an output node
(C) a mixed node
(D) a general node

98. Signal flow graphs can be used to represent

(A) only linear systems
(B) only non-linear systems
(C) both linear and non-linear systems
(D) time invariant, time varying systems

99. If the characteristic equation of a system is $s^2 + 2s + 1 = 0$, the system is

(A) undamped
(B) overdamped
(C) critically damped
(D) under damped

100. The Laplace Transform of impulse function is

(A) zero
(B) one
(C) 1/s
(D) None of the above

101. RTD is a

(A) temperature sensor
(B) light sensor
(C) flow sensor
(D) strain sensor

102. An instrument common in Electronics laboratories to measure waveform parameters of AC signals is

(A) DMM
(B) DVM
(C) CRO
(D) Frequency counter

103. Temperature above 3000°C can be measured using

(A) Thermocouple
(B) Thermistor
(C) Mercury thermometer
(D) Pyrometer

104. Wheatstone bridge is used to measure

(A) resistance
(B) capacitance
(C) inductance
(D) frequency

105. Which method is suitable for flaw detection?

(A) Photography
(B) Radio frequency
(C) Laser
(D) Ultrasonics

106. Basic function of a transducer is

(A) to convert energy from one form to another form
(B) to amplify the signal,
(C) to process the signal,
(D) to display the signal

107. A voltmeter reads 3V at full-scale deflection and is graded as 6000 ohm/V. What resistance should be connected in series with it so that it reads 12V at full-scale deflection?

(A) $1.8\times10^4\Omega$
(B) $3.6\times10^4\Omega$
(C) $5.4\times10^4\Omega$
(D) $7.2\times10^4\Omega$

108. Which of the following type of ADCs has noise-rejection capabilities?

(A) Integration type ADC
(B) Successive Approximation ADC
(C) Flash converter
(D) None of the above

109. In clinical laboratories, colourimeter is used to measure

(A) heat content
(B) colour of a liquid
(C) optical density
(D) None of the above

110. CT scanner uses

(A) RF source
(B) UV source
(C) Ultrasonic source
(D) X-ray source

111. The pH value of pure water is

(A) 0
(B) 7
(C) 14
(D) None of the above

112. White phosphorous is generally preserved in

(A) alcohol
(B) water
(C) kerosene
(D) ether

113. The general formula for alkynes is

(A) C_nH_{2n+2}
(B) C_nH_{2n}
(C) C_nH_{2n-2}
(D) C_nH_{2n-1}

114. The value of Avagadro number is

(A) 6.023×10^{23}
(B) 6.023×10^{-23}
(C) 6.23×10^{21}
(D) 6.23×10^{-23}

115. Which of the following temperature sensors generate current output proportional to temperature?

(A) AD590
(B) J-type thermocouple
(C) Pt-100
(D) LM335

116. Which of the following sensors is used in displacement measurements?

(A) RTD
(B) LVDT
(C) Piezoelectric sensor
(D) Potentiometer

117. Which of the following type of ADC has 2.44 mV resolution?

(A) 4-bit ADC operating in the voltage range of 0.0V to +10.0V
(B) 8-bit ADC operating in the voltage range of 0.0V to +5.0V
(C) 12-bit ADC operating in the voltage range of 0.0V to +10.0 V
(D) 16-bit ADC operating in the voltage range of −5.0V to +5.0V

118. Conversion time of 8-bit successive approximation type ADC driven by clock of frequency 1MHz is

(A) 8μsec
(B) 9μsec
(C) 8msec
(D) 9msec

119. Find the content of BL register after the execution of the following 8086 ALP instructions:
MOV AX, 0502H
MUL AL
MOV BL, AH

(A) 05H
(B) 10H
(C) 02H
(D) 00H

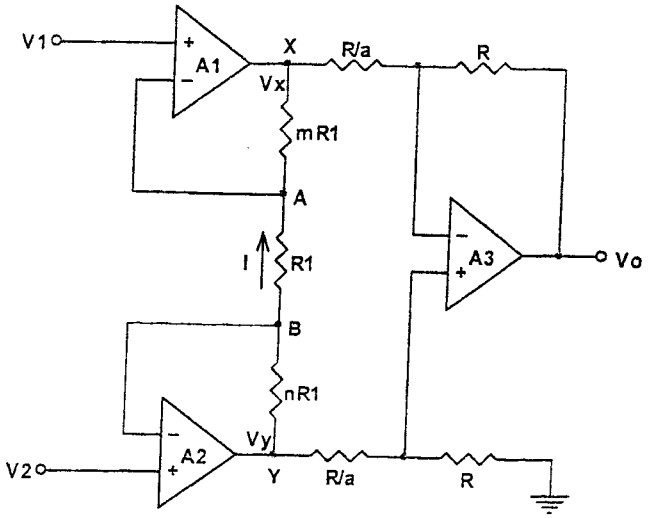
120. Find the resolution of 8-bit DAC operating with 10V internal reference

(A) 0.1 V
(B) 0.625 V
(C) 39.06 mV
(D) 2.442 mV

121. A dual-slope integrating ADC has an internal clock of frequency 12 kHz. It integrates the signal for a period of 1000 counts. Find integration period of the signal.

(A) 1000 ms
(B) 83.3 ms
(C) 166.6 ms
(D) None of the above

122. Consider the instrumentation amplifier shown below.



The output V_o is given as,

(A) $V_o = a(1+m+n)(V_2 - V_1)$, (B) $V_o = a\{1/(1+m+n)\}(V_2 - V_1)$
(C) $V_o = \{(1+m+n)/a\}(V_2 - V_1)$ (D) None of the above

123. Which of the following bridge configurations offers linear response and more sensitivity?

(A) Quarter bridge with voltage excitation
(B) Quarter bridge with current excitation
(C) Half bridge
(D) Full bridge

124. In a variable reluctance type tachometer, the rotor has 150 teeth and the counter records 13,500 pulses per second. What is the rotational speed?

(A) 4,800 rpm (B) 5,400 rpm
(C) 6,000 rpm (D) 7,200 rpm

125. Volume flow rate specifies

(A) the distance the liquid travels in a carrier per unit time
(B) volume of fluid delivered in unit time
(C) mass flowing in unit time
(D) None of the above

126. Which of the following motors work on digital inputs?

(A) AC induction motor (B) Stepper motor
(C) DC motor (D) Servo motor

127. Which of the following flowmeters is based on measuring the change in frequency?

(A) Doppler flowmeter (B) Transit-time flowmeter
(C) Electromagnetic flowmeter (D) None of the above

128. The primary colours are

(A) Red, Green and Blue (B) Yellow, Magenta and Orange
(C) Black and White (D) Red, Green and Violet

129. Velocity of light in vacuum is

(A) 3×10^{8}m/s
(B) 331 m/s
(C) 3×10^{8}cm/s
(D) 331 cm/s

130. An oscillator differs from an amplifier because

(A) it has more gain
(B) it requires no input signal
(C) it requires no dc supply
(D) it always has the same output

131. The operation of a relaxation oscillator is based on

(A) the charging and discharging of a capacitor
(B) a highly selective resonant circuit
(C) a very stable supply voltage
(D) low power consumption

132. The detector or discriminator in an AM or FM receiver

(A) detects the difference frequency from the mixer
(B) changes the RF to IF
(C) recovers the audio signal
(D) maintains the constant IF amplitude

133. Which one of the following is not an operating system?

(A) MS-DOS
(B) WINDOWS
(C) VC++
(D) LINUX

134. Which one of the following header files is to be included in a 'C' programme to use the 'C' function 'cos (x)'?

(A) stdio.h
(B) graphics.h
(C) dos.h
(D) math.h

135. j = 1;
for (i = 1; i<10; i++) j = j * i;
The above 'C' statements compute what?

(A) 9!
(B) 10!
(C) 11!
(D) None of the above

136. What is the output of the following 'C' statement?
for (i=0; i<5; i++) printf ("%d", i);

(A) 0,2,4
(B) 0, 1, 2, 3, 4, 5
(C) 0, 1, 2, 3, 4
(D) 0

137. What does the standard IEEE 802.11b specify?

(A) LAN that uses CSMA/CD
(B) LAN that uses token pass
(C) WLAN
(D) Wireless LAN

138. In the following, one term in the number series is wrong. Find out the wrong term. The number series is: 3, 10, 27, 4, 16, 64, 5, 25, 125

(A) 3
(B) 4
(C) 10
(D) 27

139. Differentiating the function $f(x) = \sin(ax + b)$, we get

(A) $\cos(ax+b)$
(B) $\cos ax$
(C) $a\cos(ax+b)$
(D) None of the above

140. At which value of x, the function $f(x) = 2x^3 - 3x^2 - 36x + 10$ has maxima?

(A) –2
(B) 3
(C) 6
(D) None of the above

141. If $\begin{bmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{bmatrix} = (a-b)(b-c)(c-a)$, then $\begin{bmatrix} 1 & 2 & 4 \\ 1 & 4 & 16 \\ 1 & 8 & 64 \end{bmatrix} =$

(A) 46
(B) 48
(C) 84
(D) 64

142. Which of the following operations is performed by a microprocessor to get data from an input device?

(A) I/O read
(B) I/O write
(C) Memory read
(D) Memory write

143. ISDN stands for

(A) Integrated Systems Dialup Network
(B) Information Systems Digital Network
(C) Integrated Systems and Digital Network
(D) Integrated Services Digital Network

144. Read the following information and answer the question.

All the roads of a city are either perpendicular or parallel to one another. The roads are all straight. Roads A, B, C, D and E are parallel to one another. Roads G, H, I, J, K, L and M are parallel to one another.

(i) Road A is 1 km east of road B
(ii) Road B is ½ km west of road C
(iii) Road D is 1 km west of road E
(iv) Road G is ½ km south of road H
(v) Road I is 1 km north of road J
(vi) Road K is ½ km north of road L
(vii) Road K is 1 km south of road M

If E is between B and C, which of the following is false?

(A) E and B intersect
(B) D is 2 km west of B
(C) D is at least 2 km west of A
(D) M is 1.5 km north of L

145. Two pipes A and B can fill a tank in 6 hours and 4 hours respectively. If they are opened on alternate hours and if pipe A is opened first, in how many hours, the tank shall be full?

(A) 4
(B) 5
(C) 4½
(D) 5½

146. The geometric series $S_n = a + ar + ar^2 + ... + ar^{n-1}$, for $|r| < 1$ or $-1 < r < +1$

(A) converges
(B) diverges
(C) oscillates
(D) None of the above

147. The probability that a number selected at random between 100 and 999 (both inclusive) will not contain the digit 7 is

(A) 11/25
(B) 12/25
(C) 16/25
(D) 18/25

148. HTML is used to

(A) edit text
(B) develop web pages
(C) drawing graphic images
(D) process photos

149. Allowing different parts of a program to execute concurrently is called

(A) Multitasking
(B) Multiprogramming
(C) Multithreading
(D) Multischeduling

150. Which of the following is a connectionless protocol?

(A) UDP
(B) TCP/IP
(C) SNMP
(D) HTTP

***