Maximum : 100 marks

Time : 1 hour and 15 minutes

1. The colour code of a 1 kΩ resistance is:
   (A) Black,brown,red
   (B) Red,brown,brown
   (C) Brown,black,red
   (D) Black,black,red

2. An ideal voltage source has :
   (A) Zero internal resistance
   (B) Infinite internal resistance
   (C) A load-dependent voltage
   (D) A load-dependent current

3. The scale used with a moving coil meter is :
   (A) Linear
   (B) Non-linear
   (C) Square law scale
   (D) None of the above

4. Electrodynamometer type of instruments can be used to measure :
   (A) AC only
   (B) DC only
   (C) Both DC and AC
   (D) None of the above

5. Which of the following will serve as a donor impurity in silicon?
   (A) Boron
   (B) Indium
   (C) Germanium
   (D) Antimony

6. What is the barrier potential of a silicon diode at room temperature?
   (A) 0.3 V
   (B) 0.7 V
   (C) 1 V
   (D) 2m V per degree Celsius

7. Ripple factor of a full wave rectifier without filter will be :
   (A) 0.2
   (B) 0.48
   (C) 0.24
   (D) 1.21

8. The output voltage of a Common Emitter amplifier is :
   (A) Amplified
   (B) Inverted
   (C) 180° out of phase with the input
   (D) All of the above

9. The output waveform of a 555 timer is :

(A) Sinusoidal (B) Triangular

(C) Rectangular (D) Elliptical

10. When Q decreases in a Colpits oscillator , the frequency of oscillation :

(A) Increase (B) Decrease

(C) Remains the same (D) Becomes erratic

11. The property of an ideal Op amp are :

(A) It should have zero input impedance

(B) It should have an infinite output impedance

(C) It should have a zero open loop gain

(D) None of the above

12. An aquadag is used in a CRO to collect :

(A) Primary electrons

(B) Secondary emission electrons

(C) Both primary and secondary emission electrons

(D) None of the above

13. The Diac is a :

(A) Transistor (B) Unidirectional device

(C) Three layer device (D) Bidirectional device

14. The NAND gate output will be low if the two inputs are :

(A) 00 (B) 01

(C) 10 (D) 11

15. A half adder circuit has two inputs and :

(A) One output (B) Two output

(C) Three output (D) None of these

16. The speed of conversion is maximum in :

(A) Successive-approximation A/D converter

(B) Parallel-comparative A/D converter

(C) Counter ramp A/D converter

(D) Dual-slope A/D converter

17. A device which converts BCD to Seven Segment is called:

(A) Decoder (B) Encoder

(C) Multiplexer (D) Demultiplexer

18. Which technology is used in a CD ROM Drive?

(A) Mechanical (B) Electromechanical

(C) Optical (D) Fiber optical

19. In 8085 name the 16 bit registers :

(A) Stack Pointer (B) Program Counter

(C) IR (D) (A) and (B)

20. In 8255, under the I/O mode of operation, we have ———————— modes.

(A) 4 (B) 3

(C) 2 (D) 1

21. Increasing the number of turns of wire on the secondary of a transformer will :

(A) decrease the secondary current

(B) increase the secondary current

(C) have no effect on the secondary current

(D) increase the primary current

22. Which of the following is an undesirable dynamic characteristic of an instrument?

(A) Reproducibility (B) Dead zone

(C) Time lag (D) Static error

23. The unit of Magnetic Flux is :

(A) Tesla (B) Ampere per meter

(C) Weber (D) Lux

24. Strain gauge, thermocouple and LVDT are examples of :

(A) Active transducers (B) Passive transducers

(C) Analog transducers (D) Primary transducers

25. The degree of reproducibility among several independent measurements of same true value under reference conditions is known as:

(A) Accuracy (B) Linearity

(C) Precision (D) Calibration

26. Stroboscope is used for measurement of :

(A) Density
(B) Viscosity
(C) Speed
(D) Magnetic flux

27. Residual voltage in the LVDT is the :

(A) Voltage when the core is at the left side of the null position
(B) Voltage when the core is at the right side of the null position
(C) Maximum available voltage
(D) Voltage when the core is at the null position

28. Flapper nozzle is used in a/an ———————— controller.

(A) Pneumatic
(B) Electronic
(C) Hydraulic
(D) None of these

29. Radiation Pyrometers are used in the temperature range of :

(A) 1200 – 2500°C
(B) 500 – 1000°C
(C) 0 – 500°C
(D) –250 – 500°C

30. The operation of a rotameter is based on :

(A) rotation of a turbine
(B) pressure drop across a nozzle
(C) pressure at a stagnation point
(D) variable flow area

31. Which of the following temperature measuring instruments need not touch the object whose temperature is being measured?

(A) Radiation Pyrometer
(B) Filled system thermometer
(C) Mercury in glass thermometer
(D) Thermocouple

32. A magnetic flow meter is :

(A) based on the principle of Faraday's law
(B) capable of measuring the flow rate of slurries and electrolytes
(C) based on the linear relationship between the fluid flow rate and the induced voltage
(D) all (A), (B) and (C)

33. A proportional controller with a gain of K_C is used to control a first order process. The offset will increase, if :

(A) K_C is reduced

(B) K_C is increased

(C) integral control action is introduced

(D) derivative control action is introduced

34. Which of the following thermocouples can measure the maximum temperature?

(A) Platinum-rhodium (B) Chromel-alumel

(C) Tungsten-Molybdenum (D) Iron-Constantan

35. Thermistors are made of :

(A) ultra pure metals (B) iron-copper alloys

(C) nickel-chromium alloys (D) metal oxides

36. A barometer measures the ———— pressure.

(A) Absolute (B) Gauge

(C) Absolute as well as gauge (D) Dynamic

37. The strain gauge should have low :

(A) Resistance temperature coefficient (B) Gauge factor

(C) Resistance (D) All of the above

38. Pick the odd one out :

(A) Pirani gauge (B) Thermocouple gauge

(C) McLeod gauge (D) Resistance-wire strain gauge

39. Feed forward controller accounts for the ———— changes.

(A) set point (B) load

(C) both (A) and (B) (D) neither (A) nor (B)

40. Pirani gauge is used for the measurement of :

(A) liquid level at atmospheric pressure (B) very high pressure

(C) liquid level under pressure (D) high vacuum

41. The deflection of the free end of the bimetallic strips in a bimetallic thermometer with temperature is nearly:

(A) linear (B) non-linear

(C) parabolic (D) hyperbolic

42. Positioning controllers are used for:

(A) low loads (B) high loads

(C) temperature changes (D) flow rate changes

43. Use of I-control along with P-control facilitates :

(A) elimination of offset (B) reduction of offset

(C) reduction of stability time (D) none of these

44. Which of the following is not a mechanical pressure sensing element?

(A) Bellows (B) Diaphragm

(C) Bourdon tube (D) U-tube

45. On-off controllers are normally used for :

(A) low loads (B) temperature changes

(C) flow rate changes (D) none of these

46. pH meter has :

(A) one cell (B) two cells

(C) three cells (D) no cell

47. Which of the following is not a differential pressure flow meter ?

(A) Venturimeter (B) Orifice meter

(C) Rota meter (D) Flow nozzle

48. Very low pressure is expresssed in microns (μ), which is equal to ———— mm of Hg coloumn (absolute) at 0°C.

(A) 0.001 (B) 0.1

(C) 0.01 (D) 0.0001

49. Cascade control means :

(A) feed forward control
(B) more than one feed-back loop
(C) on-off control
(D) one feed-back loop

50. On-off control, which is a special case of proportional control, has a band width of about ———— percent.

(A) 100
(B) 75
(C) 25
(D) 0

51. Solenoid valves are operated by :

(A) Pneumatic signal
(B) Hydraulic signal
(C) Electrical signal
(D) None of these

52. A control valve shows the flow is directly proportional to the valve opening for a constant pressure drop is :

(A) Linear valve
(B) Quick opening valve
(C) Equal percentage valve
(D) None of the above

53. The scan time of PLC depends on :

(A) Scan rate
(B) Length of the program
(C) Types of functions used in the program
(D) All the above

54. The input device used for PLC is :

(A) Push buttons
(B) Alarms
(C) Relays
(D) All the above

55. The quick opening valve that consist of a metal circular disk with its pivot axes at right angles to the direction of flow in the pipe is called :

(A) Butterfly valve
(B) Ball valve
(C) Globe valve
(D) Solenoid valve

56. When transistors are used in digital circuits they usually operate in the :

(A) active region
(B) breakdown region
(C) saturation and cutoff regions
(D) linear region

57. Another name for a unity gain amplifier is :

(A) difference amplifier (B) comparator

(C) voltage follower (D) integrator

58. The number of bits used to store a BCD digit is :

(A) 8 (B) 4

(C) 1 (D) 2

59. How will electrons flow through a p-channel JFET?

(A) from source to drain (B) from drain to source

(C) from source to gate (D) from drain to gate

60. What is the reactance value for a capacitor installed in a dc circuit?

(A) Infinite (B) Zero

(C) Moderate (D) Cannot tell

61. How many valence electrons are in every semiconductor material?

(A) 1 (B) 2

(C) 3 (D) 4

62. Voltage regulation requires :

(A) only line regulation (B) only load regulation

(C) a constant load (D) load and line regulation

63. NAND gates means :

(A) Inversion followed by AND gate (B) AND gate followed by an inverter

(C) AND gate followed by an OR gate (D) OR gate followed by an AND gate

64. Total number of cells in the Karnaugh map of a switching function (X,Y,Z) consisting of any three variables is :

(A) 4 (B) 8

(C) 10 (D) 12

65. For a MOSFET , the gate current :

(A) Is dependent on drain current

(B) Is negligibly small

(C) Is independent of gate voltage

(D) Increases with increase in gate voltage