# 024/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Unit of specific resistance is :

   (A) Metre-ohm
   (B) Centimeter-ohm-metre
   (C) Ohm-meter
   (D) Ohm-meter$^2$

2. Find the resistance of a manganin wire with one third the length and one third the diameter of a silver wire of resistance 1Ω. The specific resistance of manganin is 30 times that of silver :

   (A) 90Ω
   (B) 10Ω
   (C) 9Ω
   (D) 1Ω

3. When resistors of different values are connected in parallel ———— across each resistor is the same.

   (A) Current
   (B) Potential drop
   (C) Power
   (D) Temperature

4. Which among the following is a linear component?

   (A) Diode
   (B) Varistor
   (C) Thermistor
   (D) Resistor

5. A short circuited path has practically ———— resistance.

   (A) infinite
   (B) unit
   (C) medium
   (D) zero

6. When two 16Ω resistors are connected in parallel to a 24V battery, find the current flowing in the circuit?

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

7. Which among the following is an active element?

   (A) Resistors
   (B) Inductor
   (C) Capacitor
   (D) None of these

8. A SPDT switch has ———— ON positions :

(A) One (B) Two

(C) Three (D) None of these

9. Fuses protect the electric circuit against excessive :

(A) Voltage (B) Temperature

(C) Current (D) (B) & (C)

10. One of the following is not associated with PCB development process :

(A) Etching (B) Layout

(C) Soldering (D) EDA tools

11. The impurity atoms added to make a N type semiconductor are called :

(A) Donors (B) Acceptor

(C) Trivalent atom (D) None of these

12. Example for a pentavalent impurity atom is :

(A) Phosphorous (B) Carbon

(C) Aluminium (D) Galium

13. The barrier voltage for Ge ———— for a rise in temperature.

(A) increases (B) remains the same

(C) decreases (D) exponentially increases

14. A Schottky diode has ———— junctions.

(A) one (B) two

(C) three (D) none of these

15. A reverse biased diode is equivalent to an ideal diode in series with a resistance in the range of :

(A) Ω (B) MΩ

(C) KΩ (D) none of these

16. Zener diodes with breakdown voltage more than 6V operate under :

(A) Forward breakdown (B) Reverse breakdown

(C) Zener breakdown (D) Avalanche breakdown

17. Which among the following operates in the reverse biased mode?

(A) Photodiode
(B) light emitting diode
(C) Schottky diode
(D) none of these

18. The PIV of a diode in a half wave rectifier is :

(A) 2Vm
(B) Vm
(C) Vm/2
(D) $2Vm/\pi$

19. Find the D.C output voltage of a half wave rectifier circuit that operates at 230V, 50Hz AC supply with a transformer of turns ratio 10:1 :

(A) 23 V
(B) 32.5 V
(C) 10.35 V
(D) none of these

20. The basic application of an inductive filter is in a circuit with :

(A) low load current
(B) high load resistance
(C) lower capacitance
(D) heavy load currents

21. The % voltage regulation of a power supply which gives 95V under full load condition and 100V at no load condition is :

(A) 0.053
(B) 0.53
(C) 5.3
(D) 53

22. SCR is :

(A) Silicon Content Rectifier
(B) Silicon Controlled Rectifier
(C) Silicon Conductive Rectifier
(D) None of these

23. Which among the following is a bidirectional device with a gate control?

(A) UJT
(B) SCR
(C) DIAC
(D) TRIAC

24. For proper amplification, a transistor must operate in the ———— region.

(A) Forward biased
(B) Active
(C) Reverse biased
(D) Saturation

25. Thermocouple is a :

(A) amplifier
(B) oscillator
(C) transducer
(D) none of these

26. A transistor amplifier connected in ———— configuration has the highest voltage gain.

(A) CE (B) CB

(C) CC (D) None of these

27. The power dissipation capability of a transistor can be increased by using a :

(A) Resistor (B) Capacitor

(C) Heat Source (D) Heat sink

28. Which type of amplifier are used in the initial stages of PA system?

(A) RC coupled (B) Transformer coupled

(C) Impedance coupled (D) Direct coupled

29. When sine wave is given to an amplifier, the output exists for less than a half cycle. This is an example for ———— amplifier.

(A) class A (B) class B

(C) class C (D) class AB

30. In order to match a 16Ω loud speaker to an amplifier to get an effective load of 10Ω, the transformer must be with turns ratio :

(A) 25 (B) 20

(C) 16 (D) 10

31. In a class B push pull amplifier the output signal gets distorted, with a time interval between the positive and negative half cycles. This is called ———— distortion.

(A) Amplitude (B) Crossover

(C) Frequency (D) None of these

32. FET is a ———— controlled device.

(A) Current (B) Voltage

(C) Voltage and Current (D) None of these

33. Type of feedback used in oscillator is :

(A) Positive (B) Negative

(C) Both (A) & (B) (D) Indirect

34. In a Hartley oscillator, the tank circuit has a capacitance of $0.01\,\mu F$ and an inductance of 50mH. Determine the frequency of oscillation :

(A) 0.7 Hz (B) 7 Hz

(C) 7 KHz (D) none of these

35. The oscillator generally used to generate signals in the audio frequency range is :

(A) Hartley (B) Colpitts

(C) RC phase shift (D) Crystal

36. A single stage CE amplifier introduces a phase shift of ———— in the output signal.

(A) 45° (B) 90°

(C) 135° (D) 180°

37. A bistable multivibrator circuit changes from one state to the other :

(A) automatically (B) when the power turns ON & OFF

(C) when there is a trigger pulse (D) doesn't change state.

38. A circuit that generates a square wave from a sine wave is :

(A) Integrator (B) Differentiator

(C) Clamper (D) Schmitt trigger

39. The criteria for a good differentiating circuit is that its time constant should be :

(A) Much smaller than that of the input signal

(B) Much larger than that of input signal

(C) Equal to that of the input signal

(D) None of these

40. A circuit in which a lamp is controlled by two switches in series is equivalent to a logic gate. Identify the gate :

(A) OR (B) AND

(C) XOR (D) NAND

41. The word 'TELE' in TELEVISION means :

(A) to see (B) at distance

(C) to transmit (D) to receive

42. Dimension of a TV receiver is specified by ———— of the screen.

(A) Length (B) Width

(C) Diagonal length (D) None of these

43. Which among the following is not a complimentary colour :

(A) Yellow (B) Cyan

(C) Magenta (D) Blue

44. The dominant spectral colour of the received light is termed as :

(A) hue (B) luminance

(C) saturation (D) none of the above

45. Grassmans law is :

(A) Y= 0.59R+0.30G+0.11B (B) Y=0.59B+0.30G+0.11R

(C) Y= 0.59G+0.30R+0.11B (D) None of these

46. Audible frequency range is :

(A) 20 kHz to 200 kHz (B) 20 Hz to 20 kHz

(C) 200 Hz to 200 kHz (D) none of these

47. Which of the following is not related to a tape recorder?

(A) pinch roller (B) lens

(C) supply spool (D) leaf switch

48. Highest capacity in an optical disc can be obtained by using a laser beam of ————light.

(A) green (B) IR

(C) red (D) blue

49. Microwave frequencies are used for satellite communication because :

(A) smaller antenna can be used (B) gives high directive gain

(C) gives higher bandwidth (D) all of the above

50. The duration of H sync pulse is :

(A) $4.7\,\mu s$ (B) $1.5\,\mu s$

(C) $5.8\,\mu s$ (D) $12\,\mu s$

51. TV channels used in India are in the ———— band.

(A) UHF (B) VHF

(C) Microwave (D) None of these

52. The intercarrier frequency used for TV transmission in India is :

(A) 4.5 MHz (B) 4.5 KHz

(C) 5.5 MHz (D) 5.5 KHz

53. CCIR-B standard is popularly known as ———— system.

(A) 625 line European (B) 525 line American

(C) 625 line American (D) none of these

54. The TV programmes in America are brighter than in UK, because of :

(A) high mains frequency (B) higher mains voltage

(C) lower mains current (D) none of these

55. Vidicon camera tube is based on the principle of :

(A) Photoemission (B) Photoconduction

(C) Phototropism (D) None of these

56. Night Vision camera tubes are sensitive to :

(A) Visible light (B) UV radiation

(C) Red light (D) IR radiation

57. ———— deflection is used in CRO and ————deflection in TV tubes.

(A) electrostatic, magnetic (B) magnetic, electrostatic

(C) manual, magnetic (D) manual, electrostatic

58. PIL stands for :

(A) Primary Colours in Line (B) Phosphors in line

(C) Precision in line (D) None of these

59. When the raster gets stretched at the corners, it is called :

(A) Barrel effect (B) Pincushion effect

(C) Ghost effect (D) None of these

60. Picture tubes have high vacuum inside :

(A) To prevent influence of external magnetic fields

(B) To ensure collision free movement of electrons

(C) To reduce the weight

(D) All of the above

61. Which among the following belong to the TV tuner stage?

(A) RF amplifier (B) Local oscillator

(C) Mixer (D) All of the above

62. H — oscillator's frequency is :

(A) 100 Hz (B) 50 Hz

(C) 15625 Hz (D) 25 Hz

63. AFC circuit is included in the :

(A) Sound section (B) Tuner section

(C) V-deflection section (D) H-deflection section

64. H- sync pulse is separated from a V-sync pulse using a :

(A) Trap circuit (B) Integrator

(C) Differentiator (D) Mixer

65. Which among the following is a merit of an IF stage :

(A) high gain (B) high selectivity

(C) high stability (D) all of the above

66. Which of the following is related with the production of electromagnetic waves by an antenna?

(A) Maxwell's equation (B) Lenz's law

(C) Ohm's law (D) None of these

67. EHT required for a 50 cm size colour picture tube is about :

(A) 5 KV (B) 10 KV

(C) 25 KV (D) less than 5 KV