SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES & TECHNOLOGY
THIRUVANANTHAPURAM—695 011, INDIA.
(An Institute of National Importance under Govt.of India)
Phone—(91)0471—2443152 Fax—(91)0471—2446433, 2550728
Email-sct@sctimst.ac.in Web site—www.sctimst.ac.in

ROLL NUMBER

WRITTEN TEST FOR THE POST OF JR.TECHNICAL ASSISTANT (ELECTRONICS) – A

DATE : 07/07/2017 TIME : 09.30 AM

DURATION : 60 MINUTES TOTAL MARKS : 60

INSTRUCTIONS TO THE CANDIDATE

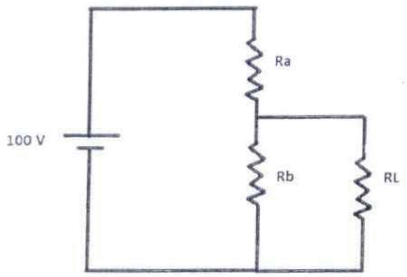
1. Write your Roll Number on the top of the Question Booklet and in the OMR sheet.
2. Each question carries 1 mark.
3. There will not be any Negative Marking.
4. Darken only the bubble corresponding to the most appropriate answer.
5. Marking more than one answer will invalidate the answer.
6. Candidate should sign on the question paper and OMR sheet.
7. Candidate should hand over the question paper and OMR sheet to the invigilator before leaving the examination hall.

Signature of the Candidate

WRITTEN TEST FOR THE POST OF JR. TECHNICAL ASSISTANT (ELECTRONICS)—A

1. Which of the following has the ability to act as open circuit for DC and a short circuit for AC of high frequency?
   (A)An inductor (B) A capacitor
   (C)A resistor (D)None of the above

2. What is the voltage across the load resistance R_L in the circuit below? The value of resistors connected in the circuit is $R_a=R_b=R_L=100\Omega$
   (A)3.33V (B)33.33V
   (C) 333.33V (D) 66.6V



3. Materials not having negative temperature coefficient of resistance are
   (A)Metals (B) Semiconductors
   (C)Insulators (D) None of the above

4. Which of the following is a trivalent material?
   (A)Antimony (B) Phosphorus
   (C) Arsenic (D) Boron

5. LED's for their display require
   (A)A voltage of 1.2V and a current of 100mA (B) A voltage of 25V and a current of 100mA
   (C)A voltage of 1.2V and a current of 20mA (D) A voltage of 25V and a current of 20mA

6. A diode in which one can change the reverse bias and thus vary the capacitance is?
   (A)Zener diode (B) Tunnel diode
   (C)Varactor diode (D) Switching diode

7. A bipolar junction transistor with forward current transfer ratio $\alpha=0.98$ when working in CE mode provides β as
   (A)0.02 (B) 49
   (C) 0.49 (D) 98

8. In a JFET drain current is maximum when V_{GS} is
   (A)Zero (B) Negative
   (C)Positive (D) Equal to V_P

9. A signal may have frequency components in the range of 0.001Hz to 10Hz. Which one of the following type of couplings should be chosen in a multistage amplifier designed to amplify the signal
   (A)RC coupling (B) Transformer coupling
   (C)Direct coupling (D) Double tuned transformer coupling

10. In a class A amplifier, conduction extends over 360° because the Q point is:
    (A)Located on load line (B) Located at or near cut-off point
    (C)Located near saturation (D) Centered on load line

11. If the Q of a single stage, single tuned amplifier is doubled then its bandwidth will
    (A)Remain same (B) Become half
    (C)Become double (D) Become four times

12. A differential amplifier is invariably used in the input stage of all op-amps. This is done to provide op-amps with very high
    (A)Open loop gain (B) Slew rate
    (C)Bandwidth (D) CMRR

13. A Hartley oscillator is used for generation of
    (A)Very low frequency (B) Radio frequency oscillation
    (C)Microwave oscillation (D) Audio frequency oscillation

14. In three RC combination of a RC phase shift oscillator each RC gives a phase shift of
    (A)45° (B) 90°
    (C)60° (D) 30°

15. In a centre tap full wave rectifier, 100 V is the peak voltage between the centre tap and one of the secondary. What is the maximum voltage across the reverse biased diode?
    (A) 200V (B) 141V
    (C)100V (D) 186V

16. The primary function of a filter is to:
    (A)Minimize AC input variations (B)Suppress odd harmonics in the rectified output
    (C)Stabilize DC level of the output voltage (D) Remove ripples from the rectified output.

17. A mono-stable multi-vibrator
    (A)Has both the states as stable states
    (B)Makes transition from one state to another when trigger is applied
    (C)Has both the states as unstable states
    (D)Has one stable state and one quasi-stable state

18. The purpose of schmitt trigger circuit is to generate a
    (A)Triangular wave (B) Square wave
    (C)Sinusoidal wave (D) Sawtooth wave

19. An operational amplifier is basically a
    (A)Low gain AC amplifier (B) High gain RC coupled amplifier
    (C)High gain DC amplifier (D) High gain transformer coupled amplifier

20. For an op-amp CMRR=10^5 and differential gain = 10^5. What is the common mode gain of the op-amp?
    (A)1 (B) 2×10^5
    (C)10^{10} (D) 10^5

21. For ideal op-amp non-inverting amplifier with resistors R_1=2kΩ and R_f=2kΩ, the overall voltage gain can be
    (A)-2 (B) +1
    (C)+2 (D) +3

22. The voltage gain of an ideal voltage follower is
    (A)1 (B) <1
    (C)0 (D) Infinity

23. An instrumentation amplifier uses
    (A)1 op-amp (B) 2 op-amps
    (C)4 op-amps (D) 3 op-amps

24. An SCR remains turned on if the anode current is more than
    (A)Breakover current (B) Holding current
    (C)Trigger current (D) Threshold current

25. Which of the following is used as the main switching element in a switched mode power supply operating in 20 kHz to 100kHz range
    (A)Thyristor (B) Triac
    (C)MOSFET (D) UJT

26. Which of the following controls reduces the size of transformer in a switched mode power supply?
    (A)Resonant circuit (B) Phase control
    (C)PWM control (D) Bidirectional control

27. Which of the following is a voltage regulator IC?
    (A)IC 555 (B) IC 7400
    (C)IC 844 (D) IC 723

28. When a Boolean expression contains 4 variables, the number of cells in the karnaugh map must be?
    (A)2^4 (B) 2^4-1
    (C)2^3 (D) 2^4+1

29. To form a half adder, which two gate combinations are essential?
    (A) AND & OR (B) AND & NOR
    (C)AND & NOT (D) AND & XOR

30. Binary 1011001 is equal to
    (A)89 decimal (B) 100 decimal
    (C)900 decimal (D) None of the above

31. The number of flip-flops required in a decade counter is
    (A)2 (B)3
    (C)4 (D) 10

32. The logic family which has minimum power dissipation is
    (A)TTL (B) I^2L
    (C)ECL (D) CMOS

33. Tunneling occurs in the tunnel diode
    (A)Only in the reverse direction (B)Only when the forward voltage is high
    (C)When the bias is zero (D) In the forward direction at a very low voltage

34. Effect of reverse bias on a P-N junction is to:
    (A)Attract holes and electrons towards the junction
    (B)Increase the junction capacitance
    (C)Have no significant effect on the holes and electrons
    (D)Pulls holes and electrons away from the junctions

35. A current transformer
    (A)Should have its secondary open while primary is carrying current
    (B)Should never have its secondary open while the primary is carrying current

(C)Is never used with the secondary circuit closed through ammeters, wattmeters, current coils or relay coils
(D)None of the above

36. As per BIS, the number of accuracy classes of an instrument is:
(A)5 (B) 6
(C)7 (D) 8

37. LVDT
(A)Converts linear motion into electrical signal
(B)Translates electrical signal into linear motion
(C)Helps measuring temperature
(D)Can be used to sense angular displacement

38. The basic principle of LASER is
(A)Stimulated absorption (B) Stimulated emission
(C)Spontaneous absorption (D) Spontaneous emission

39. Hay's bridge
(A)Is particularly suited for measurement of capacitance over a wide range of values
(B)Is particularly suited for measurement of inductance having high Q value
(C)Is suited for measurement of capacitance having high Q value
(D)Is suited for measurement of inductance having low Q value

40. Meggar is an instrument for
(A)Measuring current (B) Measuring voltage
(C)Testing insulation (D) Measuring power

41. Resolution of a measuring instrument is defined as
(A)Ratio of change of output signal to change in the input signal
(B)Consistency or reproducibility of the measurement
(C)Ability to reproduce the output in the same form as the input
(D)The smallest measureable input change

42. Bioelectric potentials related to muscle activity constitute
(A)Electromyogram (B) Electroencephalogram
(C)Electrocardiogram (D) Electroocculograph

43. Which of the following variables cannot be measured directly by a CRO

(A)Current (B) Voltage
(C)Phase difference (D) Frequency

44. The reverse current in a diode is of the order of
    (A)kA (B) mA
    (C)μA (D) A

45. In an unregulated power supply, if the load current increases, the output voltage
    (A)Remains same (B) Decreases
    (C)Increases (D) None of the above

46. Which of the following are the main components of a tank circuit
    (A)R and L (B) L and C
    (C)R and C (D) None of the above

47. Which of the following configurations has the highest current gain?
    (A)Common base (B) Voltage follower
    (C)Common emitter (D) Common collector

48. Which of the following is a volatile memory device?
    (A)Hard disk (B) Floppy disk
    (C)Magnetic type (D) RAM

49. Commercial power supplies have voltage regulation
    (A)Of within 1% (B) Of 10%
    (C)Of 15% (D) Of 25%

50. In FM for a given frequency deviation, the modulation index varies
    (A)Inversely as the modulating frequency (B) Directly as the modulating frequency
    (C)Independent of the modulating frequency (D) None of the above

51. Quantizing noise occurs in
    (A)Time division multiplexing (B)PCM
    (C)PPM (D) Frequency division multiplexing

52. The scale of a voltmeter is uniform. Its type is
    (A)Moving iron (B) Induction
    (C)Moving coil permanent magnet (D) Moving coil dynamometer

53. A digital voltmeter has a read out range from 0 to 999 counts. If the full scale reading is 9.999V, the resolution is
    (A)1 mV (B) 0.01 V
    (C)1 V (D) 1 μV

54. In input impedance of a CRO is about
(A)0 (B) 10Ω
(C)100Ω (D) 1MΩ

55. What is the range of a 3 1/2 digit, digital voltmeter?
(A)0 to 1999 (B) 0 to 1500
(C)0 to 999 (D) 0 to 19999

56. A dual trace oscilloscope usually offers two modes, chop and alternate. The alternate mode can be used for displaying:
(A)Any two waveforms
(B)Two waveforms of relatively high frequency
(C)Two waveforms of relatively low frequency
(D)One low frequency waveform and one high frequency waveform

57. The usage of electronic instruments is becoming more extensive because they have
(A)A high sensitivity and reliability
(B)A fast response and compatibility with digital computers
(C)The capability to respond to signals from remote places
(D)All of the above

58. Production of deep heat directly in the tissues of the body is achieved by
(A)Bio telemetry (B) Diathermy
(C)Defibrillator (D) Pacemaker

59. In modern electronic multimeters, a FET or MOSFET is preferred over BJT because
(A)Its input resistance is high
(B)Its input resistance is high and does not vary with change of range
(C)Its input resistance is low
(D)It is cheaper

60. The fastest A/D converter is
(A)Flash type (B) Successive approximation type
(C)Dual slope type (D) None of the above

JR. TECH. ASST. (ELECTRONICS)-A-ANSWER KEY (07/07/2017)

1	B	21	C	41	D
2	B	22	A	42	A
3	A	23	D	43	A
4	D	24	B	44	C
5	C	25	C	45	B
6	C	26	C	46	B
7	B	27	D	47	D
8	A	28	A	48	D
9	C	29	D	49	A
10	D	30	A	50	A
11	B	31	C	51	B
12	D	32	D	52	C
13	B	33	D	53	A
14	C	34	D	54	D
15	A	35	B	55	A
16	D	36	D	56	B
17	D	37	A	57	D
18	B	38	B	58	B
19	C	39	B	59	A
20	A	40	C	60	A