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Test Booklet Serial No.	103219
Test Booklet Code	BCA

Candidate's Roll No.							

Time: 2 hours **Maximum Marks: 100**

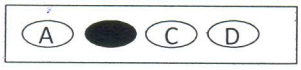
Read the following instructions carefully before you begin to answer the questions.
This Booklet contains questions in English only

WRITTEN TEST FOR THE POST OF ELECTRONIC ASSISTANT (WORKSHOP)/ TECHNICAL ASSISTANT (ELECTRONICS) – AUGUST 2014

INSTRUCTIONS TO CANDIDATES:

1. Before you start please check whether:
   a. **The Test Booklet Serial No. and the OMR Answer Sheet Serial No. are same.**
   b. All the pages in the question book are in order, and intact; and
   c. Questions 1 to 100 are available.

Note: If you find any defect/s in the above mentioned points in this Test Booklet/OMR Sheet, you must inform the Invigilator and get both of them replaced with another set immediately.

2. Use only the **BLACK/BLUE BALL POINT PEN** that is provided to you to write/mark in the answer sheet.
3. Write your Roll Number in the box above.
4. This Booklet contains 100 questions.
5. All the questions carry equal marks. Each Correct response will be given 1 (One) mark.
6. Negative marks will be there for wrong answers. 0.25 marks will be deducted for each wrong answer.
7. You have to use only the OMR Answer Sheet which is given along with this Question Booklet for answering the questions. You must complete the details in the prescribed places in the OMR Answer Sheet failing which your OMR Answer Sheet will not be evaluated.
8. The questions are of multiple-choice type. **FOUR** suggested answers **A, B, C** and **D** follow each question. Only one of them is the most appropriate. Select the most appropriate answer and **DARKEN THE CORRESPONDING OVAL IN THE ANSWER SHEET.** For eg: 

9. ONLY ONE answer is to be darkened for each question. No correction is feasible as the marking is to be done with pen. Marking of wrong options as well as multiple markings will be treated as wrong and negative marks will be awarded accordingly.
10. As the Answer Sheet will be evaluated by a machine only, the marking of the answers by shading of the ovals may be done carefully.
12. Rough work **should not be done on the answer sheet or in the Question Booklet** other than in the 'Space for Rough Work' provided at the end of the Question Booklet.
13. Mobile phones, wireless communication devices or any other devises/equipments are completely banned within the examination halls/rooms. Candidates are advised not to bring any such devises/equipments into the examination hall/room even by switching them off as these will not permitted inside the hall/room. The candidature of those candidates who do not comply with these instructions will be cancelled without further notice and they will not be allowed to appear in the written test.
14. This booklet should be **RETURNED INTACT** at the end of the examination failing which the candidature of the candidates will be cancelled without intimation and his/her Answer Sheet will not be evaluated.

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TEST BOOKLET BCA

PART – A [Consists of technical questions]

1. An integrating digital voltmeter measures

A) true average value B) rms value

C) peak value D) peak to peak value

2. Resistors R1 and R2 have the nominal values 3Ω and 6Ω and tolerance of ±10% and ±5% respectively. What would be the tolerance in the equivalent resistance value when R1 and R2 are connected in parallel

A) ±3.33% B) ±15%

C) ±4.47% D) ±6.34%

3. The minimum number of watt meters required to measure 3 phase 3 wire balanced or unbalanced power is

A) 1 B) 2

C) 3 D) 4

4. The scale of voltmeter is uniform. Its type is

A) moving iron B) Induction

C) moving coil permanent magnet D) moving coil dynamometer

5. A oscilloscope 4cmX4cm screen has its own sweep out, fed back to its input if x&y Sensitivities are same, the oscilloscope will display

A) triangular wave B) diagonal line

C) sine wave D) Circle

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6. In circuit-breakers the contact space is ionized by

A) thermal ionization of gas
B) thermal emission from surface of contacts
C) field emission from the surface of contacts
D) any of the above

7. A fuse is normally a

A) current limiting device
B) voltage limiting device
C) power limiting device
D) power factor correcting device

8. Superposition theorem is applicable only to networks that are:

A) Linear
B) nonlinear
C) time-invariant
D) Passive

9. A typical EMG signal ranges from

A) About 0.1 to 0.5 mV
B) About 0.1 to 5 mV
C) About 1 to 5 mV
D) About 1 to 0.5 mV

10. EEG machines have notch filters to eliminate

A) Noise
B) Un damped oscillations
C) Frequency interference
D) Muscle artifacts

11. The T wave is produced during

A) Atrial depolarization
B) Atrial repolarization
C) Repolarization of the ventricles
D) Depolarization of the ventricles

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12. For biomedical applications the mostly used amplifier is

A) Single ended amplifier B) Differential amplifier

C) Inverting operational amplifier D) Chopper amplifier

13. Pre amplifier isolation in ECG circuit is to

A) Increase input impedance B) Decrease input impedance

C) Increase output impedance D) Decrease output impedance

14. What is the cause for light or dark recording of EEG?

A) Pen is not touching properly B) Ink tubes are clogged

C) Incorrectly loaded paper D) Lead connection problem

15. In microprocessor the register which holds the address of the next instructions to be fetched is

A) Accumulator B) Program Counter

C) Stack Pointer D) Instructor Register

16. Which of the following statement is true?

A) ROM is read/write memory B) PC points to the last instruction that was executed

C) Stack works on the principle of lifo D) All instructions affect the flags

17. The CMOS is a combination of _____

A) p and n JFET B) p and n BJT

C) SCR and DIAC D) p and n MOSFET

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18. In a constant power type load

A) Torque is proportional to speed
B) Torque is proportional to square of speed
C) Torque is inversely proportional to speed
D) Torque is independent to speed

19. When a UJT is used for triggering an SCR, the wave shape of the voltage obtained from UJT circuit is a

A) Sine wave
B) Square wave
C) Trapezoidal wave
D) Saw-tooth wave

20. When current dramatically increases, the voltage point on the diode forward V-I characteristic curve is called the

A) Breakdown voltage
B) Knee voltage
C) Barrier voltage
D) Both B) and C) are true

21. Series or parallel resonant circuits can be used to create

A) Low pass filters
B) Low pass and high pass filters
C) Band-pass and band-stop filters
D) All the above

22. A device with slowest switching speed is

A) LED
B) LCD
C) Nixie tubes
D) None of the above

23. The phenomena of creeping occurs in

A) Ammeters
B) Voltmeters
C) Wattmeters
D) Watt-hour meters

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24. In an induction motor, the torque T is related to supply voltage V as below

A) $T\alpha\frac{1}{V}$ B) $T\alpha\sqrt{V}$

C) $T\alpha V$ D) $T\alpha V2$

25. P-N junction is

A) a rectifier B) an amplifier

C) an oscillator D) a coupler

26. The -------can conduct current in either direction and is turned-on when the breakover voltage is exceeded

A) SCR B) Diac

C) SCS D) Traic

27. A virtual ground

A) is a ground for voltage B) is a ground for both voltage and current

C) is ground for current D) is a ground for voltage but not for current

28. EPROM contents can be erased by exposing it to

A) ultraviolet rays B) infrared rays

C) burst of microwaves D) intense heat radiations

29. Microcontrollers often have

A) CPUs B) RAM

C) ROM D) all of the above

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30. Skew is used in induction motors in order to reduce torque due to

A) time harmonics
B) space harmonics
C) slot harmonics
D) reverse rotating field

31. Neglecting all losses, the developed torque(T) of a separately excited dc operating under terminal voltage,is related to its output power(P) as under

A) $T \alpha \sqrt{P}$
B) $T \alpha P$
C) $T2 \alpha P2$
D) T is independent of P

32. Load factor is defined as the ratio of _____

A) Average Demand / Max. Demand
B) Max. Demand / Average Demand
C) Average Demand / Connected load
D) Connected load / Max. Demand

33. The ratio between, rotor input, rotor output and copper losses is

A) 1 : 1 – s : s
B) 1 : s : 1 - s
C) s : 1 – s : 1
D) 1 – s : s : 1

34. The device used to convert a binary number to a 7-segment display format is

A) Multiplexer
B) encoder
C) Decoder
D) Register

35. A flash type ADC uses

A) Counter
B) Op-amps
C) An integrator
D) Flip flop

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36. Norton's equivalent circuit consists of

A) Voltage source in parallel with impedance
B) Voltage source in series with impedance
C) Current source in series with impedance
D) Current source in parallel with impedance

37. The most efficient method of increasing the speed of a 3.75KW d.c. shunt motor would be

A) Armature control
B) Flux control
C) Ward-Leonard
D) Tapped-field control

38. The voltage regulation of an alternator having 0.75 leading p.f. load, no-load induced e.m.f. of 2400V and rated terminal voltage of 3000V is ----------

A) 20%
B) -20%
C) 150
D) -26.7

39. For high voltages (>33KV),it is a usual practice to use

A) Pin type insulators
B) Strain insulators
C) Suspension type insulators
D) Shackle insulators

40. HVDC transmission line are more economical for

A) Inter-connected system
B) Medium transmission line
C) Long transmission line
D) Short transmission line

41. What device is similar to an RTD but has a negative temperature coefficient?

A) Strain gauge
B) Thermistor
C) Negative-type RTD
D) Thermocouple

42. The Hall Effect

A) is a phenomenon with no practical applications
B) is used in various sensor applications
C) can develop potentials of thousands of volts
D) is the basis for solar cell operation

43. Which of the following is a desirable characteristic of an instrument?

A) High drift
B) High fidelity
C) High measuring lag
D) Poor reproducibility

44. Which of the following essential features is possessed by an indicating instrument?

A) Deflecting device
B) Controlling device
C) Damping device
D) All of the above

45. In a portable instrument, the controlling torque is provided by

A) Spring
B) gravity
C) eddy currents
D) all of the above

46. Principle of operation of LVDT is based on the variation of

A) Mutual inductance
B) Self-inductance
C) Capacitance
D) Resistance

47. Name the machine which performs kidney function in case of renal failure.

A) Haemodialyser
B) Heart-Lung Machine
C) Diathermy
D) Pacemaker

48. The instrument used to scan the soft tissues

A) Ultrasound
B) CT
C) MRI
D) All the above

49. "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". The above statement is associated with

A) Coulomb's square law
B) Gauss's law
C) Maxwell's first law
D) Maxwell's second law

50. The power dissipated in a pure capacitor is

A) Zero
B) proportional to applied voltage
C) proportional to value of capacitance
D) both B) and C)

51. In a strain measuring device, using a strain gauge, the output quantity is

A) Voltage
B) resistance
C) Impedance
D) either A) or B)

52. The 10 MHz in the specification of CRO means that

A) the sweep frequency is 10 MHz
B) the frequency of input signal should not be more than 10 MHz
C) the vertical amplifier has been designed for 10 MHz
D) none of the above

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53. Measure of the repeatability of a measurement of some quantity is

A) Error
B) precision
C) Accuracy
D) significant

54. What device is similar to an RTD but has a negative temperature coefficient?

A) Strain gauge
B) Thermistor
C) Negative-type RTD
D) Thermocouple

55. A Hall Effect sensor

A) exists only in theory
B) is a non-contacting magnetic sensor
C) can operate only a few times before failure
D) produces very large voltages

56. The improper response time of the amplifier in the biomedical recorders

A) Affects the gain of the amplifier
B) Delays the signals
C) Changes the shape of the waveform of the signal
D) Attenuates the signals

57. Hot wire anemometer is used for the measurement of

A) flow rates of fluids
B) flow rates of granular solids
C) very high temperature
D) thermal conductivity of gases

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58. Bourdon tube is never made of

A) phosphor bronze B) monel metal

C) stainless steel D) cast iron

59. When the damping co-efficient (ξ) is unity, the system is

A) overdamped B) critically damped

C) underdamped D) highly fluctuating

60. Which is the most suitable instrument for measuring pressure below 3 microns ?

A) mcleoid gauge B) alphatron

C) ionisation gauge D) bourdon guage

61. Flapper nozzle is used in a/an _____ controller

A) electronic B) hydraulic

C) pneumatic D) none of these

62. Capacitive transducers are normally employed for_____ measurements

A) Static B) dynamic

C) Transient D) both static and dynamic

63. The capacitance microphone is used for the detection of

A) heart rate B) blood flow

C) heart sound D) foot pressure

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64. Fibre optic sensor can be used to sense _____

A) Displacement B) power

C) Current D) resistance

65. FET is advantageous in comparison with BJT because of

A) High input impedance B) High noise

C) High gain bandwidth product D) Its current controlled behavior

66. Maximum power is transferred when load impedance is

A) equal to source impedance B) equal to half of the source impedance

C) equal to zero D) none of the above

67. What type of electrodes is more often employed in EMG work?

A) Needle electrodes B) Surface electrodes

C) Floating electrodes D) Limb electrodes

68. An ammeter of 0-25 A range has a guaranteed accuracy of 1% of full scale reading. The current measured is 5 A. The limiting error is

A) 2% B) 2.5%

C) 4% D) 5%

69. The ability of a material to remain magnetized after removal of the magnetizing force is known as

A) permeability B) Reluctance

C) hysteresis D) Retentivity

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70. A 120Ω resistor must carry a maximum current of 25 mA. Its rating should be at least

A) 4.8 W
B) 150 mW
C) 15 mW
D) 480 mW

71. The positive potential of the cell membrane during excitation is

A) Action potential
B) Drift potential
C) Diffusion potential
D) Passive potential

72. A ———— needle electrode contains both active reference electrode with in the same structure

A) Earth ring
B) Hypodermic
C) Paddle
D) Concentric core

73. It is required that a strain gauge has gauge factor of 100. The proper strain gauge is

A) constantan strain gauge
B) nichrome strain gauge
C) semiconductor strain gauge
D) alloy strain gauge

74. Which of the following is a desirable characteristic of an instrument ?

A) high drift
B) high fidelity
C) high measuring lag
D) poor reproducibility

75. Which of the following thermocouples will give the highest output for the same value of hot and cold junction temperature ?

A) platinum - platinum + rhodium
B) iron-constantan
C) chromel-constantan
D) all will give the same output

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76. Load cells are used for the measurement of

A) Stress B) weight

C) Strain D) velocity

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

A) radiation/infrared pyrometer B) filled system thermometer

C) mercury in glass thermometer D) thermo electric thermometer

78. Which two values are plotted on a B-H curve graph?

A) Reluctance and flux density B) Permeability and reluctance

C) Magnetizing force and permeability D) Flux density and magnetizing force

79. To reduce common mode interference during recording of bio signals one can use_____

A) Buffer amplifier B) Differential amplifier

C) Single ended amplifier D) Chopped amplifier

80. Pre amplifier isolation in ECG circuit is to

A) Increase input impedance B) Decrease input impedance

C) Increase output impedance D) Decrease output impedance

PART – B [language, reasoning, quantitative aptitude, GK & Current Affairs]

81. The first President of BRICS Bank will be from _____ and its headquarters will be in _____

A) China, India B) India, Brazil

C) India, China D) Russia, India

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82. _____ is World's most powerful Supercomputer.

A) IBM's Sequoia
B) Tianhe-2
C) Cray's Titan
D) RIKEN's K

83. Recently, NASA has launched Ship-Aircraft Bio-Optical Research (SABOR) experiment to probe ____?

A) Ocean Ecology and Carbon Cycle
B) Aquatic animal's life style
C) Ocean Minerals
D) Effect of ocean acidification

84. Which of the following disease is also known as factor IX deficiency, or Christmas disease?

A) Haemophilia A
B) Haemophilia B
C) Hepatitis B
D) Hepatitis C

85. What is the allowed value for the Specific Absorption Rate (SAR) of mobile handsets:

A) 1.6 watt/kg averaged over 10 grams of human tissue
B) 1.8 watt/kg averaged over 10 grams of human tissue
C) 1.6 watt/kg averaged over 1 gram of human tissue
D) 1.8 watt/kg averaged over 1 gram of human tissue

The following three questions consist of two words each that have a certain relationship to each other, followed by a four options consisting of pairs. Select the option that has the same relationship as the original pair of words printed in bold.

86. **Curator : Museum**

A) Wit : Wisdom
B) Bank : Teller
C) Manager : Office
D) Doctor : Patient

87. **Energy : Dissipate**

A) Atom : Explosion B) Money : Squander

C) Power : Generator D) Battery : Charge

88. **Philatelist : Stamps**

A) Numismatist : Coins B) Geneticist : Chromosomes

C) Cartographer : Maps D) Jeweller : Jewels

In the following two questions, four words have been given out of which three are alike in some manner, while the fourth one is different. Select the odd one.

89. A) Seismograph B) Hygrometer

C) Anemometer D) Sphygmomanometer

90. A) Bronze B) Germanium

C) Brass D) Duralumin

Choose the word which best expresses the meaning of the word given in bold:

91. **Industrious**

A) Factory B) unenterprising

C) Hardworking D) inactive

Choose the word which is opposite in meaning to the word given in bold:

92. **Ingenuity**

A) Intelligence B) inventiveness

C) ineptness D) creativity

Fill in the blanks:

What are you talking _____93_____ ? They are making fun _____94_____ you. What are they interested ____95_____ ?

93. A) On B) of
C) At D) about

94. A) In B) of
C) At D) about

95. A) Of B) about
C) On D) in

96. A group of 1200 persons consisting of captains and soldiers is travelling in a train. For every 15 soldiers, there is one captain. The number of captains in the group is _____

A) 80 B) 85
C) 70 D) 75

97. There are four numbers ----- a, b, c and d. a is the reciprocal of c. d is the multiplicative identity. The product of squares of these four numbers is equal to 1521. Then, the number b is _____

A) 49 B) 39
C) 29 D) data is inadequate

98. Find the number which when added to itself 13 times, gives 2730.

A) 195 B) 185
C) 210 D) cannot be determined

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99. On Children's day, sweets were to be equally distributed among 160 children in a school. Actually on the Children's day, 30 children were absent and therefore each child got 6 sweets extra. In total, how many sweets were available for distribution?

A) 2080 B) 1040

C) 4160 D) 8320

100. In a city, 40 % of the adults are illiterate while 85 % of the children are literate. If the ratio of the adults to that of the children is 2 : 3, then what percentage of the population is literate?

A) 20 % B) 25 %

C) 50 % D) 75 %

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