

Sl. No. :

30011501

EIE08

Register
Number

2014

**ELECTRICAL AND INSTRUMENTATION ENGINEERING
(Degree Standard)**

Time Allowed : 3 Hours]

[Maximum Marks : 300

Read the following instructions carefully before you begin to answer the questions.

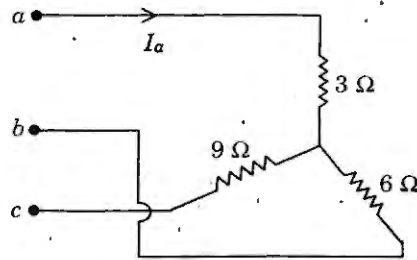
IMPORTANT INSTRUCTIONS

1. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains 200 questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there and ensure there are no blank pages in the question booklet. In case any defect in the Question Paper is noticed it shall be reported to the Invigilator within first 10 minutes.
3. Answer all questions. All questions carry equal marks.
4. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.
5. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, your Answer Sheet will not be evaluated.
6. Each question comprises four responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
7. In the Answer Sheet there are four circles (A), (B), (C) and (D) against each question. To answer the questions you are to mark with Ball point pen ONLY ONE circle of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. e.g. If for any item, (B) is the correct answer, you have to mark as follows :

(A) ● (C) (D)
8. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.
9. The sheet before the last page of the Question Booklet can be used for Rough Work.
10. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
11. Do not tick-mark or mark the answers in the Question booklet.

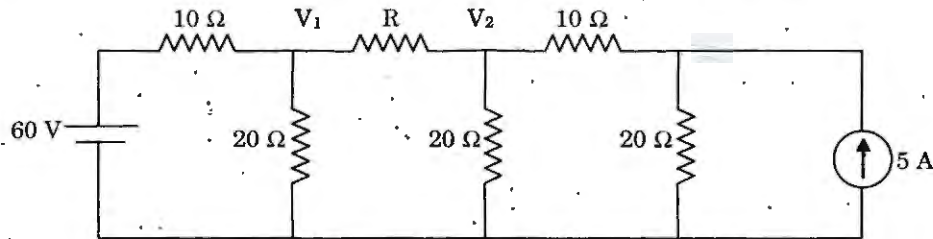
SEAL

1. For the Y connected purely resistive circuit shown in figure, if the line voltage is 220 V, three phase balanced, then the line current (I_a) will be



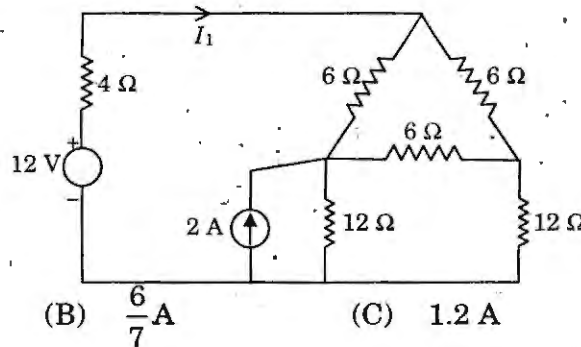
- (A) 24.44 A (B) 14.67 A
~~(C) 29.06 $\angle -23.42^\circ$ A~~ (D) 18.33 A

2. In the given circuit, $V_1 = 40$ V when R is 10Ω . When R is zero, the value of V_2 will be



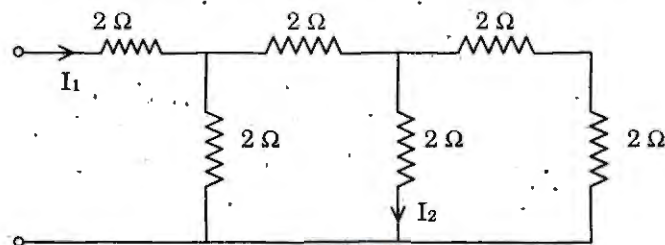
- ~~(A) 40 V~~ (B) 30 V (C) 20 V (D) 10 V

3. For the circuit shown in figure, the current I_1 is



- (A) 4 A (B) $\frac{6}{7}$ A (C) 1.2 A ~~(D) 0 A~~

4. The current transfer ratio I_2/I_1 for the network shown in figure is



- (A) 0.4 (B) 0.5 ~~(C) 0.25~~ (D) 0.75

5. In a power transformer, conservator takes care of
- (A) expansion and contraction of oil (B) atmospheric temperature variation
(C) atmospheric humidity variation (D) load fluctuation
6. As resistance is added in the rotor circuit of a slip ring induction motor, its maximum torque
- (A) increases but occurs at the same slip
(B) decreases but occurs at the same slip
(C) remains the same and also occurs at lower slip
(D) remains the same but occurs at higher slip
7. The use of Higher flux density in the transformer design
- (A) Reduces the weight per KVA
(B) Increases the weight per KVA
(C) Has no relation with weight of transformer
(D) Increases the weight per KW
8. The expression for power developed by a salient pole synchronous generator is given by
- (A) $P_m = \frac{E_b \cdot V}{X_d} \cos \alpha + \frac{V^2 (X_d - X_q)}{2X_d X_q} \cos 2\alpha$ (B) $P_m = \frac{E_b \cdot V}{X_d} \sin \alpha + \frac{V^2 (X_d - X_q)}{2X_d X_q} \sin 2\alpha$
(C) $P_m = \frac{E_b \cdot V}{X_q} \cos \alpha + \frac{V^2 (X_d \cdot X_q)}{2(X_d - X_q)} \cos 2\alpha$ (D) $P_m = \frac{E_b \cdot V}{X_q} \sin \alpha + \frac{V^2 (X_d \cdot X_q)}{2(X_d - X_q)} \sin 2\alpha$
9. The power factor in a transformer
- (A) is always unity (B) is always leading
(C) is always lagging (D) depends on the power factor of load
10. The compensating windings in a dc machine is located
- (A) on armature slots for compensation of armature reaction
(B) on commutating pole to improve commutation
(C) in slots in the pole shoes to neutralize the cross magnetising effect of armature reaction
(D) on armature slots to prevent commutation
11. Which of the following motors is not self starting?
- (A) Squirrel cage induction motor (B) Wound rotor induction motor
(C) Synchronous motor (D) DC series motor

12. The open loop transfer function of a unity feedback control system is $G(s) = \frac{K(s+2)}{(s+1)(s-7)}$. For $K > 6$, the stability characteristic of the open loop and closed loop configurations of the system are respectively,
- (A) stable and unstable
 (C) unstable and stable
 (B) stable and stable
 (D) unstable and unstable
13. $L^{-1}[G(s)] = g(t)$
 $g(t)$ is called as
- (A) step response of the system
 (C) ramp response of the system
 (B) impulse response of the system
 (D) parabolic response of the system
14. The response produced by simultaneous application of different forcing function is the sum of the all individual responses. A system obeys this principle is known as
- (A) Non linear system
 (C) Stabilized system
 (B) Linear system
 (D) Unstable system
15. The major advantages of open loop control system are
- (A) maintain the required quality in the output
 (B) disturbances and changes in calibration cause error
 (C) no stability problem
 (D) output may be different from what is desired
16. A system that maintains a prescribed relationship between the output and the reference input by comparing them and using the difference as a means of control is called a
- (A) inferential control system
 (B) feedback control system
 (C) feed forward control system
 (D) spilt-range
17. Ring main distribution system is preferred to a radial system because
- (A) It is less expensive
 (C) Power factor is higher
 (B) Voltage drop in the feeder is less
 (D) Supply is more reliable
18. In load flow analysis, the load connected at a bus is represented as
- (A) constant current drawn from the bus
 (B) constant impedance connected at the bus
 (C) voltage and frequency dependent source at the bus
 (D) constant real and reactive drawn from the bus

19. Consider the following two statements consisting of Assertion (A) and Reason (R) and select your answer using the codes given below

Assertion (A) : Zero sequence currents are flowing from line to line in a transformer

Reason (R) : Transformer windings are connected in star grounded

- (A) (A) is false, (R) is true
 (B) Both (A) and (R) are true and (R) is not the correct explanation of (A)
 (C) Both (A) and (R) are true and (R) is the correct explanation of (A)
 (D) (A) is true, (R) is false

20. Basic quantity measured in a distance relay is

- (A) Impedance
 (B) Voltage difference
 (C) Current difference
 (D) Frequency difference

21. The impedance value of generator is 0.2 p.u. on a base value of 11 kV, 50 MVA. The impedance value for a base value of 22 kV, 150 MVA is

- (A) 0.15 p.u. (B) 0.2 p.u. (C) 0.3 p.u. (D) 2.4 p.u.

22. The use of High speed circuit breakers

- (A) Reduce the short circuit current
 (B) Improves system stability
 (C) Decreases system stability
 (D) Increases the short circuit current

23. The insulation level of 400 kV EHV over head transmission line is decided on the basis of

- (A) Lightning over voltage
 (B) Switching over voltage
 (C) Corona inception voltage
 (D) Radio and TV interference

24. In an inverse definite minimum time, electro magnetic type over current relay the minimum time feature is achieved because

- (A) saturation of the magnetic circuit
 (B) proper mechanical design
 (C) appropriate time delay element
 (D) electromagnetic damping

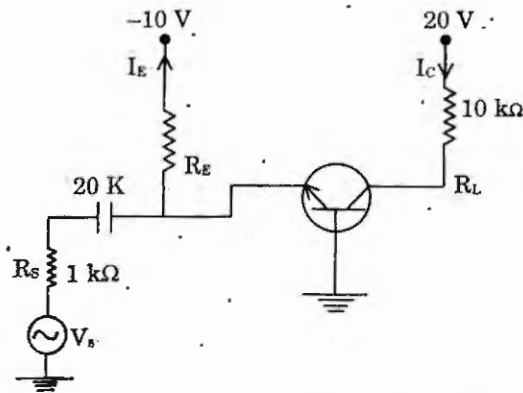
25. The insulation resistance of a cable of length 10 km is 1 m Ω , for a length of 100 km of the same cable, the insulation resistance will be

- (A) 1 m Ω (B) 10 m Ω (C) 0.1 m Ω (D) 0.01 m Ω

26. Lightning Arresters are used in power systems to protect electrical equipments against

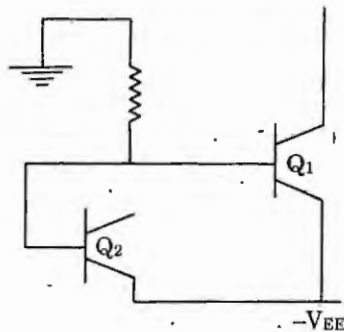
- (A) Direct strokes of lightning
 (B) Power frequency of over voltages
 (C) Over voltages due to indirect lightning strokes
 (D) Over current due to lightning strokes

27. For the given CB circuit. Determine the dc operating point



- (A) $Q(15 \text{ V}, 0.5 \text{ mA})$ (B) $Q(12 \text{ V}, 2.5 \text{ mA})$
 (C) $Q(50 \text{ V}, 0.5 \text{ mA})$ (D) $Q(15 \text{ V}, 2.5 \text{ mA})$

28. The circuit given below is a block commonly used in linear IC's. This is basically a



- (A) constant current source (B) current amplifier
 (C) constant voltage source (D) voltage amplifier

29. A uniformly doped npn bipolar transistor has following parameters $N_E = 10^{18} \text{ cm}^{-3}$, $N_B = 5 \times 10^{16} \text{ cm}^{-3}$, $N_C = 2 \times 10^{19} \text{ cm}^{-3}$, $D_E = 8 \text{ cm}^2/\text{s}$, $D_B = 15 \text{ cm}^2/\text{s}$, $D_C = 14 \text{ cm}^2/\text{s}$, $x_E = 0.8 \mu\text{m}$, $x_B = 0.7 \mu\text{m}$. The emitter efficiency γ is

- (A) 0.982 (B) 0.964 (C) 0.977 (D) 0.994

30. Which of the following is not an advantage of Darlington pair?

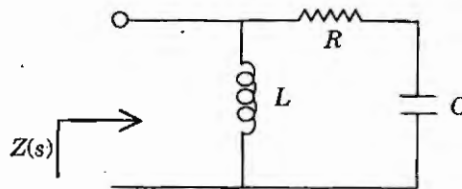
- (A) It can be readily formed from 2 adjacent transistors in an IC
 (B) It provides very high β value
 (C) Enormous impedance transformation capability
 (D) Low impedance transformation capability

31. Match the items given in Column A with the items in Column B

| | Column A | Column B |
|-----|--|-------------------|
| (a) | $XYZ + \overline{XYZ} + \overline{XYZ} + XY\overline{Z}$ | 1. $X+Y$ |
| (b) | $(X+Y+\overline{XY})\overline{Z}$ | 2. O |
| (c) | $X+\overline{Y}+\overline{XY}$ | 3. \overline{Z} |
| (d) | $XZ+X\overline{Z}Y$ | 4. X |

| | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | 1 | 4 | 3 | 2 |
| (B) | 1 | 2 | 3 | 4 |
| (C) | 4 | 3 | 2 | 1 |
| (D) | 3 | 4 | 1 | 2 |

32. Determine $Z(s)$ for the network shown in fig below



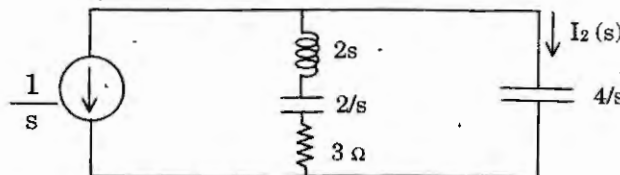
(A)
$$\frac{Rs\left(s + \frac{1}{RC}\right)}{s^2 + \left(\frac{R}{L}\right)s + \frac{1}{LC}}$$

(B)
$$\frac{s + \frac{1}{RC}}{s^2 + \left(\frac{L}{R}\right)s + \frac{1}{LC}}$$

(C)
$$\frac{Rs\left(s + \frac{R}{C}\right)}{s^2 + \left(\frac{R}{L}\right)s + \frac{1}{LC}}$$

(D)
$$\frac{s + \frac{R}{C}}{s^2 + \left(\frac{R}{L}\right)s + \frac{1}{LC}}$$

33. Find $I_2(s)$ by current division method. Assume all initial conditions to zero



(A)
$$s \left[\frac{2s^2 + 3s + 2}{2s^2 + 3s + 6} \right]$$

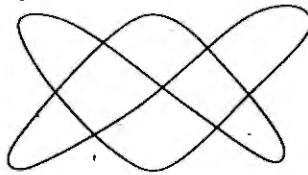
(B)
$$s \left[\frac{2s^2 + 3s + 6}{2s^2 + 3s + 2} \right]$$

(C)
$$-\frac{1}{s} \left[\frac{2s^2 + 3s + 2}{2s^2 + 3s + 6} \right]$$

(D)
$$\frac{1}{s} \left[\frac{2s^2 + 3s + 2}{2s^2 + 3s + 6} \right]$$

34. The poles and zeros of a driving point function of a network are simple and interlace on the negative real axis with a pole closest to the origin. It can be realised
- (A) by an LC network (B) as an RC driving-point impedance
 (C) as an RC driving-point admittance (D) only by an RLC network
35. For very high frequencies the driving point impedance function, $Z(s) = \frac{(s+1)(s+3)}{s(s+2)(s+4)}$
- (A) a resistance of $\frac{3}{2}\Omega$ (B) a capacitor of 4 F
 (C) a capacitor of $\frac{1}{4}\text{F}$ (D) an inductance of 4 H
36. The transfer function $\frac{4(s^2+25)}{s^2+2.5s+100}$ is of
- (A) Low pass notch filter (B) Low Q band pass filter
 (C) High Q band pass filter (D) High pass notch filter
37. A unit step current of 1 A is applied to a network whose driving point impedance is $Z(s) = \frac{V(s)}{I(s)} = \frac{s+3}{(s+2)^2}$; then the steady state and initial values of the voltage developed across the source are
- (A) $\left(\frac{3}{4}\text{V}, 1\text{V}\right)$ (B) $\left(\frac{1}{4}\text{V}, \frac{3}{4}\text{V}\right)$ (C) $\left(\frac{3}{4}\text{V}, 0\text{V}\right)$ (D) $\left(1\text{V}, \frac{3}{4}\text{V}\right)$
38. In PMMC type instrument, voltmeter loading can be greatly reduced by using a
- (A) BJT collector follower (B) BJT emitter follower
 (C) FET emitter follower (D) SCR resistor follower
39. In a PMMC type ammeter, if the full-scale meter current is known, the sensitivity can be determined as
- (A) square of full-scale current (B) reciprocal of full-scale current
 (C) square root of full-scale current (D) cube root of full-scale current
40. Instrument used for measurement of quantity of electricity (charge) passed through it is known as
- (A) Meggar (B) D'Arsonval Galvanometer
 (C) Ballistic Galvanometer (D) Ohm meter
41. A vertical spindle is generally preferred to a horizontal one in Ammeters and Voltmeters, from the point of view of
- (A) large friction torque (B) no friction torque
 (C) small friction torque (D) allowable friction torque

42. A closed lissajous pattern is shown in figure. Find the ratio of frequencies of vertical and horizontal signals



- (A) $\frac{2}{3}$ ~~(B) $\frac{3}{2}$~~ (C) $\frac{1}{3}$ (D) $\frac{3}{1}$

43. The following is not used in Active display

- (A) CRT (B) Gas discharge plasma
(C) LEDs ~~(D) LCDs~~

44. The following is not in X-Y recorder

- (A) input variable is plotted as a function of the other
(B) zero adjustments are available
~~(C) paper is keep rotating~~
(D) paper is held stationary

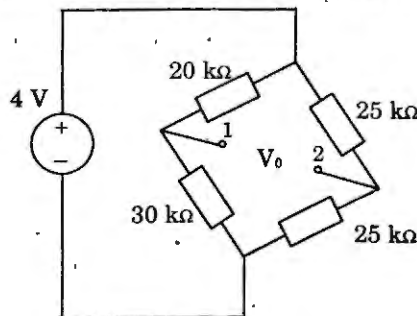
45. Analog recorders may be broadly classified into three categories, namely

- ~~(A) graphic recorders, oscillographic recorders and magnetic tape recorders~~
(B) strip chart recorders, circular chart recorders and X-Y recorders
(C) potentiometer type recorders, bridge type recorders and LVDT recorders
(D) galvanometer recorders, CRT recorders and tape recorders

46. The time base of CRO is developed by

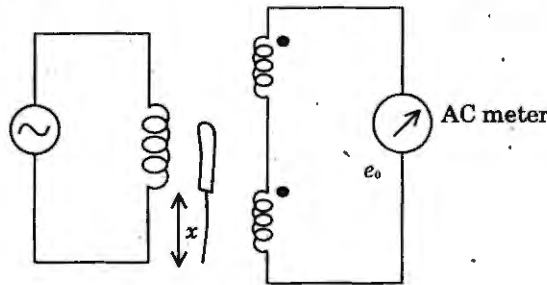
- (A) square waveform ~~(B) saw tooth waveform~~
(C) sine waveform (D) output from a built I clock

47. The output resistance across the terminal 1 and 2 of the DC bridge is

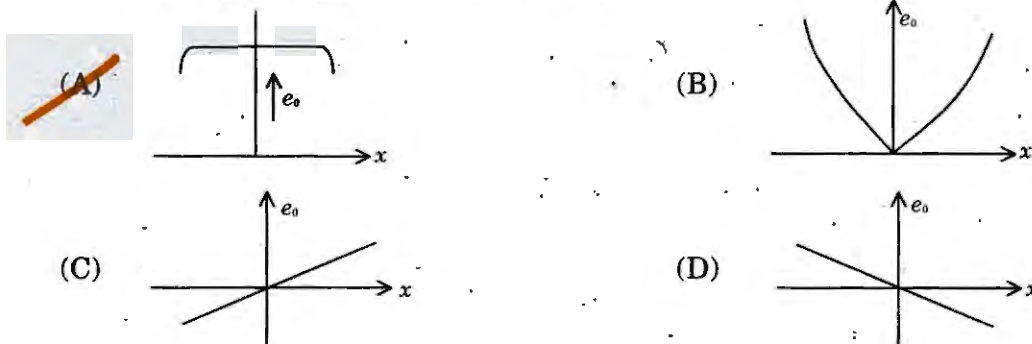


- (A) 12.5 kΩ ~~(B) 24.5 kΩ~~ (C) 25.0 kΩ (D) 100 kΩ

48. In an instrument the smallest measurable input is known as
 (A) Threshold (B) Resolution (C) Dead zone (D) Precision
49. A set of independent current measurements were taken by six observation
 12.8 A, 12.2 A, 12.5 A, 13.1 A, 12.9 A and 12.4 A. Find variance
 (A) 0.15 A^2 (B) 0.115 A^2 (C) 1.15 A^2 (D) 0.05 A^2
50. Determine the magnitude and % of limiting error in ohm for the following resistance value.
 $R_1 = 37 \Omega \pm 5\%$ $R_2 = 75 \Omega \pm 5\%$ $R_3 = 50 \Omega \pm 5\%$
 (A) $160 \pm 5\%$ (B) $162 \pm 5\%$ (C) $160 \pm 3\%$ (D) $162 \pm 3\%$
51. The reference power for determining the sound power level is
 (A) 0.00002 W (B) 10^{-12} W (C) 1 W (D) 100 W
52. The output of an LVDT is connected to a 5 V voltmeter through an amplifier. An output of 2 mV appears across the terminals of the LVDT when the core is displaced through a distance of 0.5 mm. Sensitivity of the LVDT is
 (A) 5 V/cm (B) 4 mV/mm (C) 1 mV/mm (D) 2 mV/mm
53. The two secondary coils of an LVDT have wrongly been connected as shown in fig :



Then the input-output relationship would be



54. LVDT, used for displacement measurement is
 (A) an externally power operated transducer
 (B) a self generating passive transducer
 (C) a capacitive transducer
 (D) a digital transducer

55. Which is the disadvantage of LVDT?

- (A) Linearity is good upto 5 mm (B) Low power device
(C) Low hysteresis device ~~(D) AC input generates noise~~

56. The output of an LVDT is connected to a 5 V voltmeter through an amplifier of amplification factor 250. The voltmeter scale has 100 divisions and the scale can be read to $1/5^{\text{th}}$ of a division. An output of 2 mV appears across the terminals of the LVDT when the core is displaced through a distance of 0.5 mm. Calculate the sensitivity of the LVDT

- (A) 1 V/mm ~~(B) 4 mV/mm~~ (C) 2 mV/mm (D) 8 mV/mm

57. A seismic type displacement transducer is used for frequency that are

- (A) lower than the undamped natural frequency of the instrument
~~(B) higher than the undamped natural frequency of the instrument~~
(C) equal to the undamped natural frequency of the instrument
(D) at all frequency

58. Helical spiral springs are used in spring balances for measurement of force. The axial displacement y expressed in terms of Force F is given by

- ~~(A) $y = \frac{4FnR^3}{Gr^4}$~~ (B) $y = \frac{2FnR^3}{Gr^4}$ (C) $y = \frac{Gr^4}{4FnR^3}$ (D) $y = \frac{Gr^4}{2FnR^3}$

59. The strain gauge torque meter has many advantages, but the disadvantage is that

- (A) it is fully temperature compensated
(B) provide automatic compensation for bending and axial loads
(C) gives maximum sensitivity for a given torque
~~(D) ease of connection to power source~~

60. In a driving type dynamometer, if V is the voltage, I is the current generated in the sink, η is the efficiency of the sink motor, the power supplied to the sink is

- (A) $P = \frac{VI}{\eta}$ ~~(B) $P = VI\eta$~~ (C) $P = \frac{V\eta}{I}$ (D) $P = \frac{\eta}{VI}$

61. The seismic mass of a spring-mass accelerometer is 50 g and the spring constant is 5000 N/m. The amplitude of relative displacement is ± 2 cm. The maximum measurable acceleration in g is

- (A) 102 g ~~(B) 204 g~~ (C) 408 g (D) 816 g

62. In a thermocouple element, heat energy transferred to the hot junction is converted to electrical energy by
 (A) Peltier effect (B) Seebeck effect (C) Hall effect (D) Faraday effect
63. The thermocouple that can measure a temperature in the range of 1300° C to 1400° C is
 (A) Iron - Constantan (B) Copper - Constantan
 (C) Platinum - Platinum rhodium (D) Chromel - Alumel
64. A thermocouple is suddenly immersed in a medium of high temperature. The approximate time taken by the thermocouple to reach 98% of the steady state value is
 (A) equal to the time constant of the thermocouple
 (B) equal to twice the value of the time constant of the thermocouple
 (C) equal to four times the value of the time constant of the thermocouple
 (D) independent of the time constant
65. In X-ray spectroscopy, with the increase in the atomic number of the target element, intensity of the spectrum
 (A) decreases
 (B) increases
 (C) intensity is independent of atomic number
 (D) remains equal
66. The reference electrode in pH measurement is
 (A) Glass electrode (B) Hydrogen electrode
 (C) Antimony electrode (D) Hg-calomel electrode
67. In a pH measurement, the reference and measuring electrodes were hydrogen and calomel electrodes respectively. The measured emf was 650 mV. If the oxidation potential of the saturated calomel electrode is -0.246 V, then the pH value of the solution is
 (A) 3.42 (B) 6.84 (C) 8.84 (D) 13.78
68. The pH value of pure water is
 (A) 0 (B) 7 (C) 10 (D) 14
69. pH value of a solution is defined as
 (A) Positive logarithm of the hydrogen ion concentration
 (B) Negative logarithm of the hydrogen ion concentration
 (C) Hydrogen ions concentration
 (D) Hydroxyl ions concentration
70. Tungsten filament lamp wavelength range is
 (A) 3.5 nm to 2.5 μm (B) 35 nm to 25 μm
 (C) 350 nm to 2.5 μm (D) 3500 nm to 25 μm
71. Photo multiplier tube has a _____ internal gain.
 (A) low (B) high (C) medium (D) infinite

72. Initial value theorem can be computed as
- (A) $\lim_{t \rightarrow \infty} y(t) = \lim_{z \rightarrow \infty} [y(z)]$ (B) $\lim_{t \rightarrow 0} [y(t)] = \lim_{z \rightarrow \infty} [y(z)]$
 (C) $\lim_{t \rightarrow \infty} [y(t)] = \lim_{z \rightarrow 0} [y(z)]$ (D) $\lim_{t \rightarrow 0} [y(t)] = \lim_{z \rightarrow 0} [y(z)]$
73. In a process control system, to suppress small errors in a process _____ is used.
- (A) ISE (B) IAE (C) ITAE (D) 1/4 decay ratio
74. For a process having more variable than equation, then the process is
- (A) over specified process (B) under specified process
 (C) exactly specified process (D) is not a specified process
75. In ultrasound Doppler effect the relation between change in _____ and blood _____ is $\frac{2f_0 u \cos \theta}{C}$.
- (A) time and blood velocity (B) frequency and blood velocity
 (C) frequency and blood pressure (D) time and blood pressure
76. In FECCG magnitude of R wave is
- (A) 100 micro volts to 300 micro volts (B) 200 micro volts to 330 micro volts
 (C) 150 micro volts to 250 micro volts (D) 120 micro volts to 200 micro volts
77. The duration for Q wave in ECG is
- (A) 0.30 to 0.35 Sec (B) 0.35 to 0.44 Sec (C) 0.44 to 0.48 Sec (D) 0.48 to 0.56 Sec.
78. _____ design foreign molecules worm and damaged organells
- (A) Peroxisomes (B) Lysosomes
 (C) Centrosomes (D) Ribosomes
79. _____ is the measure of reproducibility of the measurements. It is used in the measurements to describe the consistency of results.
- (A) Sensitivity (B) Stability (C) Accuracy (D) Precision
80. For internal stimulation using pacemaker, the current applied in the range of
- (A) 2 to 15 mA (B) 20 to 50 mA (C) 25 to 60 mA (D) 30 to 75 mA
81. Which one of the following pacemaker has simple mechanism and the longest battery life?
- (A) Ventricular synchronous pacemaker (B) Ventricular asynchronous pacemaker
 (C) Ventricular inhibited pacemaker (D) Atrial synchronous pacemaker

82. In frequency division multiplexing telemetry a carrier frequency of _____ can be used with a bandwidth of _____.
- (A) 230 MHz \pm 320 KHz (B) 220 MHz \pm 300 KHz
 (C) 200 MHz \pm 300 KHz (D) 320 MHz \pm 220 KHz
83. In frequency division multiplexing technique the modulated subcarrier signal consists of _____ upper sideband transmission.
- (A) 28 to 30 KHz (B) 30 to 32 KHz (C) 32 to 36 KHz (D) 36 to 38 KHz
84. In case of radio frequency telemetry, the channel is _____ physical link.
- (A) one of (B) not a (C) equal to (D) specified as
85. The Modulation Index (mf) in frequency modulation is _____ the modulation index "m" in amplitude modulation.
- (A) is not equal to (B) analogous
 (C) square of (D) twice of
86. The address bus of 8085 microprocessor is 16 bit wide. Hence the memory which can be accessed by this address bus is
- (A) 112 KB (B) 4 KB (C) 16 KB (D) 64 KB
87. How many flag bits are available in 8085?
- (A) 3 (B) 4 (C) 5 (D) 6
88. The port that is used for multiplexing address and data pins for connecting to an external memory in a 8051/31 microcontroller is
- (A) Port 0 (B) Port 1 (C) Port 2 (D) Port 3
89. The register select bits to identify register bank z in 8051 microcontroller is
- (A) RS1 - 0, RS0 - 0 (B) RS1 - 0, RS0 - 1
 (C) RS1 - 1, RS0 - 0 (D) RS1 - 1, RS0 - 1
90. After the execution of the following 8051 micro controller code, the content of Stack Pointer (SP) is
- MoV 81 H, # 30 H
 MoV Ro, # 0 ACH
 PUSH 00 H
 PUSH 00 H
- (A) 00 H (B) 30 H (C) 31 H (D) 32 H

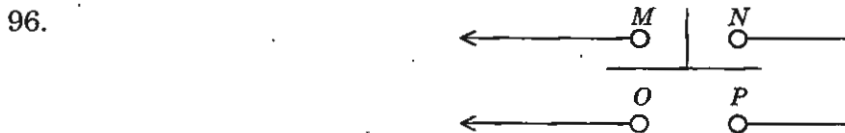
91. Output B comes on at a specific time after output A is turned on, when A is turned off, B also goes off is known as
- (A) Off delay timer ~~(B) On delay timer~~
 (C) Limited on delay timer (D) Limited off delay timer

92. Communication in DCS should have _____ delay.
- (A) minimum (B) maximum ~~(C) no~~ (D) moderate

93. Long-term data storage and retrieval is being performed in the
- (A) LLHID (B) LCU (C) HLCU ~~(D) HLHID~~

94. In many DCS dedicated devices called sequence of events recorder monitor the occurrence of discrete event is known as
- (A) Process alarms ~~(B) Trip lags~~
 (C) Equipment alarm (D) Operator control action

95. _____ provide a background for the dynamic portion of the graphic display.
- (A) Data field ~~(B) Static field~~
 (C) Dynamic field (D) Transient field



The configuration is known as

- (A) NO SPST (B) NC SPST (C) NO ~~(D) SPDT~~

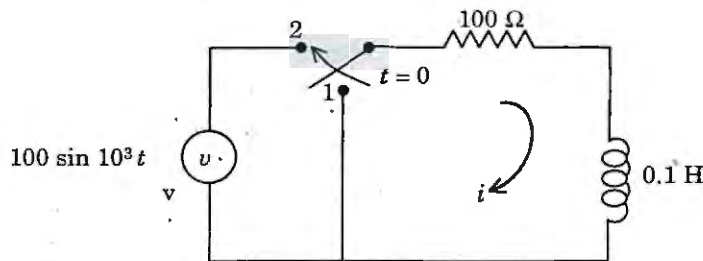
97. The display in DCS is similar to a P & ID (or) mimic panel used on conventional panel board to illustrate the process equipment and its associated instrumentation is known as
- ~~(A) Area graphic display~~ (B) Alarm summary display
 (C) Batch control display (D) Operator guide

98. In hierarchy display at this level deal with the control loops and data points relating to a single process unit within a plant are known as
- (A) Plant level ~~(B) Group level~~ (C) Area level (D) Loop level

99. If an RLC resonant circuit has a resonance frequency of 1.5 MHz and a bandwidth of 10 KHz. If $C = 150 \text{ pF}$, then effective resistance of the circuit will be

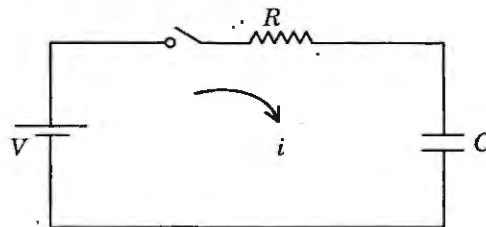
- ~~(A)~~ 4.7 Ω (B) 29.5 Ω
 (C) 9.5 Ω (D) 14.75 Ω

100. In the circuit shown in figure $i(0_+) = i(0_-) = 0.5 \text{ A}$. The current i for $t > 0$ will be



- ~~(A)~~ $\frac{1}{\sqrt{2}} \sin(10^3 t - 45^\circ) + e^{-1000 t} \text{ A}$ (B) $\frac{1}{2} \angle -45^\circ \text{ A}$
 (C) $0.5 \sin(100 t - 60^\circ)$ (D) $0.866 \sin(1000 t - 90^\circ)$

101. The transient response of the initially relaxed network shown in the figure is

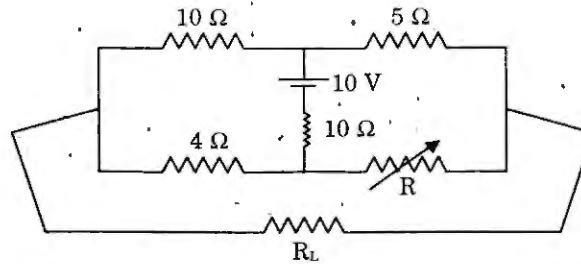


- (A) $i = \frac{V}{R} e^{-t/RC}$ (B) $i = \frac{V}{R} (1 - e^{-t/RC})$
 (C) $i = \frac{V}{R} (1 + e^{-t/RC})$ ~~(D)~~ $i = \frac{V}{R} e^{-t/RC}$

102. A three phase star connected load is balanced and has $a(20 + j20)\Omega$ impedance per phase. The load is connected to a 440 V, 3 phase source. The total power input to the load measured by two wattmeter method is 4830 W. If the impedances are connected in delta, the total power input will be

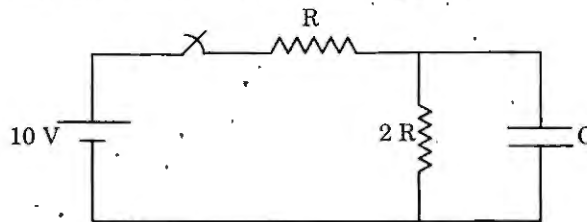
- (A) 4830 W (B) 9660 W
~~(C)~~ 14490 W (D) 11430 W

103. In the network shown in the figure, for the current to be zero in R_L , the value of R should be adjusted to



- (A) 1Ω (B) 5Ω (C) 10Ω ~~(D) 2Ω~~

104. The time constant of the network shown in the figure is



- (A) $3 RC$ (B) $2 RC$ (C) $\frac{RC}{2}$ ~~(D) $\frac{2}{3} RC$~~

105. The pulse frequency resolution of a stepper motor is given by the expression

- (A) $n = f \beta N_s \cdot N_r$ frequency in pps ~~(B) $n = \beta \times \frac{f}{360}$ frequency in pps~~
 (C) $n = \beta \times \frac{f}{180}$ frequency in pps (D) $n = \frac{f \beta}{N_s \cdot N_r}$ frequency in pps

106. Match the following :

Column I (DC motor)

Column II (Applications)

- | | |
|---------------------------------|-----------------------------------|
| (a) Differential compound motor | 1. Coal cutting machines |
| (b) Cumulative compound motor | 2. Hoists and cranes |
| (c) Series motor | 3. Looms in textile mills |
| (d) Shunt motor | 4. Research and experimental work |

- | | | | |
|------------------|-----|-----|-----|
| (a) | (b) | (c) | (d) |
| (A) 1 | 3 | 4 | 2 |
| (B) 4 | 1 | 2 | 3 |
| (C) 3 | 1 | 2 | 4 |
| (D) 2 | 4 | 1 | 3 |

107. For successful parallel operation of 2 single phase transformers. The most essential condition is that their
- (A) percentage impedances are equal ~~(B) polarities are properly connected~~
 (C) turns ratio are exactly equal (D) KVA ratings are equal

108. Match the following

| Column I | | Column II | |
|--------------------------|--|---------------|--|
| (a) Torque | | 1. Current | |
| (b) Moment of inertia | | 2. Charge | |
| (c) Angular velocity | | 3. Voltage | |
| (d) Angular displacement | | 4. Inductance | |

| | (a) | (b) | (c) | (d) |
|----------------|-----|-----|-----|-----|
| (A) | 1 | 2 | 4 | 3 |
| (B) | 4 | 2 | 3 | 1 |
| (C) | 3 | 4 | 1 | 2 |
| (D) | 2 | 3 | 4 | 1 |

109. The transfer functions of two compensators are $C_1 = \frac{10(s+1)}{(s+10)}$, $C_2 = \frac{(s+10)}{10(s+1)}$.

Which one of the following statements is correct?

- ~~(A)~~ C_1 is a lead compensator and C_2 is a lag compensator
 (B) C_1 is a lag compensator and C_2 is a lead compensator
 (C) Both C_1 and C_2 are lead compensators
 (D) Both C_1 and C_2 are lag compensators

110. For the transfer function $G(s)H(s) = \frac{1}{s(s+1)(s+0.5)}$. The phase cross-over frequency is

- (A) 0.5 rad/sec ~~(B) 0.707 rad/sec~~
 (C) 1.732 rad/sec (D) 2 rad/sec

111. What will be the closed loop transfer function of a unity feedback control system whose step response is given by $C(t) = K [1 - 1.66 e^{-3t} \sin(6t + 37^\circ)]$?

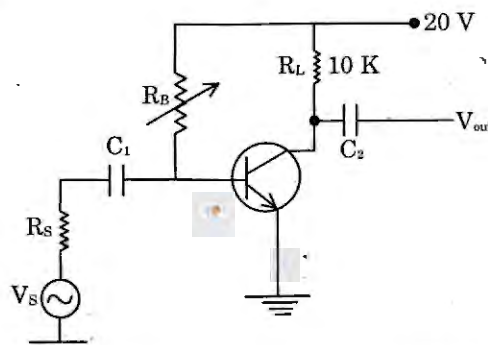
- ~~(A)~~ $\frac{100K}{s^2 + 16s + 100}$ (B) $\frac{10}{s^2 + 16s + 100}$
 (C) $\frac{K}{s^2 + 16s + 100}$ (D) $\frac{10K}{s^2 + 8s + 10}$

112. For a second order system $2\frac{d^2y}{dt^2} + 4\frac{dy}{dt} + 8y = 8x$. The damping ratio is

- (A) 0.1 (B) 0.25 (C) 0.333 ~~(D) 0.5~~

113. A three phase over head transmission line has its conductors horizontally spaced with spacing between adjacent conductors equal to 'd', if now the conductors of the line are rearranged to form a equilateral Triangle of sides equal to 'd' then
- (A) Average capacitance and inductance will increase
 - (B) Average capacitance decreases and inductance increases
 - ~~(C) Average capacitance increases and inductance decreases~~
 - (D) Surge impedance loading of the line increases
114. Consider the following two statements consisting of Assertion (A) and Reason (R) and select your answer using the codes given below.
- Assertion (A) : In transmission lines, conductors are transposed
- Reason (R) : The resistance per phase has to be same
- (A) (A) is true and (R) is false
 - ~~(C) Both (A) and (R) are true~~
 - (B) Both (A) and (R) are false
 - (D) (A) is false and (R) is true
115. Pelton turbines are suitable for
- (A) Low heads
 - ~~(C) High heads~~
 - (B) Medium heads
 - (D) Low and medium heads
116. Storage requirement for hydro electric plants can be determined from
- (A) flow duration curve
 - ~~(B) hydrograph~~
 - (C) stream flow
 - (D) load demand
117. A synchro is used to
- (A) accelerate a rotating shaft
 - ~~(B) convert an angular position of a shaft into an electrical signal~~
 - (C) convert linear motion into angular position
 - (D) amplify low frequency signals
118. For making an unstable system to stable
- ~~(A) gain of the system should be increased~~
 - (B) gain of the system should be decreased
 - (C) the number of zeros to the loop transfer function should be increased
 - (D) the number of poles to the loop transfer function should be increased
119. In a 70/6 A.C.S.R conductor there are
- (A) 35 aluminium conductors and 3 steel conductors
 - ~~(B) 70 aluminium conductors and 6 steel conductors~~
 - (C) 70 steel conductors and 6 aluminium conductors
 - (D) 35 steel conductors and 3 aluminium conductors
120. For low head and high discharge the hydraulic turbine used is
- (A) Francis turbine
 - ~~(B) Kaplan turbine~~
 - (C) Pelton wheel
 - (D) Propeller

121. The capacitor switching is easily done with
 (A) Air blast circuit breaker (B) Oil circuit breaker
 (C) Vacuum circuit breaker (D) SF₆ circuit breaker
122. For a fault at the terminals of a Synchronous Generator, the fault current is maximum for a
 (A) 3-phase fault (B) phase to phase fault
 (C) line to ground fault (D) line to line fault
123. CMRR of an ideal operational amplifier is
 (A) Unity (B) Infinity (C) Zero (D) 10⁶
124. A photodiode works based on
 (A) Forward current (B) Reverse current
 (C) Forward voltage (D) Reverse voltage
125. In a p-type silicon sample, the hole concentration is $2.25 \times 10^{15}/\text{cm}^3$. If intrinsic carrier concentration is $1.5 \times 10^{10}/\text{cm}^3$. Then electron concentration is
 (A) zero (B) $10^{10}/\text{cm}^3$ (C) $10^5/\text{cm}^3$ (D) $1.5 \times 10^{25} \text{cm}^3$
126. In a 4 bit weighted resistor D/A converter. The resistor value corresponding to LSB is 32 K ohm. The resistor value corresponding to MSB will be
 (A) 32 K ohm (B) 16 K ohm (C) 8 K ohm (D) 4 K ohm
127. An active filter consisting of an op-amp resistors $R_1 R_2 R_3$ and two capacitors of value C each has a transfer function $T(s) = \frac{-s/R_1 C}{s^2 + \left(\frac{2s}{R_3 C}\right) + \frac{1}{(R R_3 C^2)}}$. Where $R_1 \cap R_2 = R$ $R_1 = 2 K\Omega$, $R_2 = 2/3 K\Omega$, $R_3 = 200 K\Omega$, $C = 0.1 \mu F$. Find central frequency ω_0
 (A) 1008 rad/sec (B) 1108 rad/sec (C) 1118 rad/sec (D) 1018 rad/sec
128. Determine the value of R_B required to adjust the circuit to optimum operating point. Take $\beta = 50$ and $V_{BE} = 0.7 \text{ V}$



- (A) 665 K Ω (B) 765 K Ω (C) 865 K Ω (D) 965 K Ω

129. 54/74164 is an 8 bit

- (A) serial input parallel output shift register
- (B) serial input serial output shift register
- (C) parallel input serial output shift register
- (D) parallel input parallel output shift register

130. The output of _____ gate are complement of an OR gate.

- (A) AND
- (B) NOR
- (C) NAND
- (D) NOT

131. In _____ gate an output occurs when any (or) all input are present.

- (A) AND
- (B) OR
- (C) NOR
- (D) NAND

132. A divide by 78 counter can be realised by using

- (A) 6 numbers of mod-13 counters
- (B) 13 numbers of mod-6 counters
- (C) one mod-13 counter followed by one mod-6 counter
- (D) 13 numbers of mod-13 counters

133. The binary number equivalent of decimal number 28 is

- (A) 11111
- (B) 10011
- (C) 11011
- (D) 11110

134. Find the quotient of 10011 divided by 101

- (A) 111
- (B) 11
- (C) 10
- (D) 101

135. The decimal equivalent of BCD number is

0110 10001 0011 0010

- (A) 6933
- (B) 6932
- (C) 693.2
- (D) 69.32

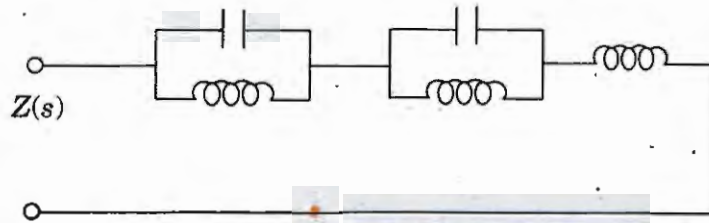
136. Add decimal number 12 and 9 in BCD system. The result is

- (A) 10011100
- (B) 11011011
- (C) 00011011
- (D) 111100100

137. The largest decimal number can be stored in a six flip flop counter (mod-64) is

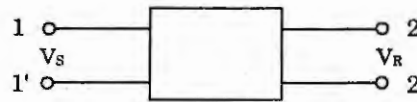
- (A) 63
- (B) 64
- (C) 65
- (D) 62

138. The driving point impedance of the network shown in figure has



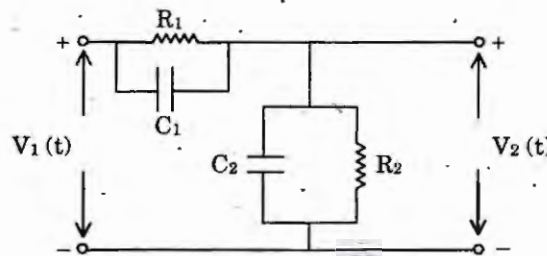
- (A) zeros at 0 and infinity
 (B) poles at 0 and infinity
 (C) pole at 0 and zero at infinity
 (D) zero at 0 and pole at infinity

139. The voltage transfer ratio of two-port networks connected in cascade may be conveniently obtained from the



- (A) product of the individual ABCD matrices of the two networks
 (B) product of voltage transfer ratios of the two individual networks
 (C) sum of the Z-matrices of the two networks
 (D) sum of the h-matrices of the two networks

140. For the compensated attenuator of figure below the impulse response under the condition $R_1 C_1 = R_2 C_2$ is



- (A) $R_2 / (R_1 + R_2) [1 - e^{-t/R_1 C_1}] u(t)$
 (B) $[R_2 / (R_1 + R_2)] \delta(t)$
 (C) $[R_2 / (R_1 + R_2)] u(t)$
 (D) $[R_2 / (R_1 + R_2)] [1 - e^{-t/R_1 C_1}] u(t)$

141. A two port network is defined by the relations $I_1 = 2V_1 + V_2$ and $I_2 = 2V_1 + 3V_2$. Then Z_{12} is

- (A) -2Ω (B) -1Ω (C) $-1/2 \Omega$ (D) $-1/4 \Omega$

142. An ammeter is convertible to a voltmeter by
 (A) changing the scale
 (B) putting a large resistance in parallel with the actual measuring part of the instrument
 (C) putting a large resistance in series with the actual measuring part of the instrument
 (D) simply installing the instrument in parallel with the circuit

143. Light load adjustments for induction type energy meters are usually done at
 (A) 10% of full load current
 (B) 5% of full load current
 (C) 50% of full load current
 (D) 1% of full load current

144. A power factor meter has
 (A) four control springs
 (B) two control springs
 (C) one control springs
 (D) no control springs

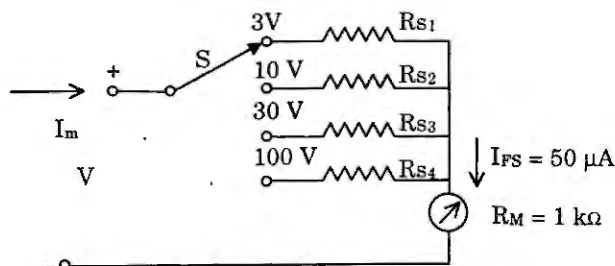
145. A Merz price maximum demand indicator indicates
 (A) maximum demand
 (B) average maximum demand over a specified period of time
 (C) maximum energy consumption
 (D) minimum prescribed demand

146. The sensitivity of an instrument is the
 (A) smallest increment in the input that can be detected with certainty
 (B) largest input change to which the instrument fails to respond
 (C) ratio of the change in the magnitude of the output to the corresponding change in the magnitude of the input
 (D) closeness of the output values for repeated applications of a constant input

147. Thermocouple instruments can be used for a frequency range
 (A) upto 125 Hz (B) upto 20 KHz (C) upto 1 MHz (D) 50 MHz and above

148. Determine the velocity of the electron beam in an oscilloscope when the voltage applied to its accelerating anode is 2500 V
 (A) 26.95×10^6 m/s (B) 91.95×10^6 m/s (C) 29.65×10^6 m/s (D) 29.65×10^6 cm/s

149. Consider the JFET DC Electronic voltmeter of figure with identical transistors and parameters $g_o = 0$ and $g_m = 0.01$ s. Let $R_D = 1\text{k}\Omega$, $V_1 = 100\text{mV}$ and $R_M + R_S = 1\text{k}\Omega$. Calculate the meter current I_M



- (A) 0.33 mA (B) 3 mA (C) 3 A (D) 30 mA

150. A CRO screen has ten divisions on the horizontal scale. If a voltage signal $5 \sin(314t + 45^\circ)$ is examined with a line base setting of 5 msec/div, the number of cycles of signal displayed on the screen will be
 (A) 0.5 cycles ~~(B) 2.5 cycles~~ (C) 5 cycles (D) 10 cycles
151. The deflection sensitivity of a Cathode ray tube is
~~(A) directly proportional to the deflection voltage~~
 (B) directly proportional to the square of the deflection voltage
 (C) inversely proportional to the deflection voltage
 (D) independent of the deflection voltage
152. A zero error in a micrometer is termed as
 (A) Accidental error ~~(B) Systematic error~~
 (C) Interference error (D) Random error
153. The moving system of a MC ammeter has a mass of 5g and a spring stiffness of 9×10^{-3} N/rad. The natural frequency of its oscillations will be
 (A) 314 rad/s (B) 628 rad/s ~~(C) 632.4 rad/s~~ (D) 9.42 rad/s
154. In a parallel circuit the current in one branch, I_1 is (100 ± 2) A and in the other, I_2 is (200 ± 5) A. Determine the total current considering limiting error
 (A) (300 ± 2) A (B) (300 ± 5) A ~~(C) (300 ± 7) A~~ (D) (300 ± 3) A
155. A first order system has a time constant of τ . It is subjected to a transient pulse of duration T . The output will closely correspond to the input when
~~(A) $T \gg \tau$~~ (B) $T \geq \tau$ (C) $T < \tau$ (D) $T \ll \tau$
156. The reliability of an instrument refers to
~~(A) measurement changes owing to temperature variation~~
~~(B) the degree to which repeatability continues to remain within the specified limits~~
 (C) the life of the instrument
 (D) the extent to which the characteristics remain linear
157. A reading is recorded as 68.0 Ω . The reading has
~~(A) three significant figures~~ (B) one significant figure
 (C) two significant figures (D) four significant figures
158. The errors committed by a person in the measurement are
~~(A) Gross errors~~ (B) Random errors
 (C) Instrumental errors (D) Environmental errors

159. A Linear Variable Differential Transformer (LVDT) is

- ~~(A)~~ a displacement transducer (B) an impedance matching transformer
(C) a differential temperature sensor (D) an auto transformer

160. Linear variable differential transformer has

- (A) two primary coils connected in phase and a secondary coil
(B) two primary coils connected in opposition and a secondary coil
(C) one primary coil and two secondary coils connected in phase
~~(D)~~ one primary coil and two secondary coils connected in opposition

161. In smart sensor system, Network Capable Application Processor (NCAP) performs the function of

- (A) Data transfer and communication ~~(B)~~ Detection and control of TIMs
(C) Command Processing (D) Analogue signal conditioning

162. Which of the following device is used for large power rating for transducing displacement?

- (A) Single slide wire potentiometer ~~(B)~~ Cermet
(C) Wire wound potentiometer (D) LVDT

163. In smart sensor, TEDS module stands for

- (A) Transducer Electrical Digital Sensor ~~(B)~~ Transducer Electronic Data Sheet
(C) Transmitter Electrode Digital Score (D) Transmitter Electrical Drift Sensor

164. A variable reluctance type of transducer consisting of a coil which is wound on a

- (A) Aluminium core (B) Copper core
~~(C)~~ Ferromagnetic core (D) Silver core

165. _____ provide dimensional standards of length for industry.

- (A) Vernier calliper (B) Micrometer screw
(C) Dial Gauge ~~(D)~~ Gauge blocks

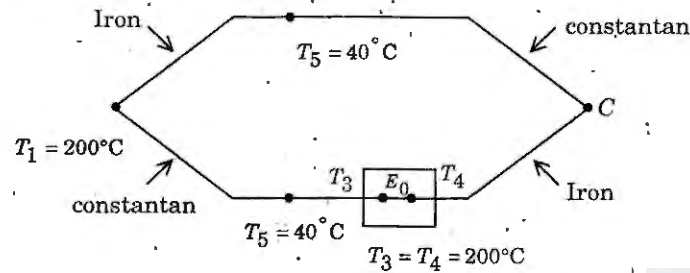
166. Backlash error of screw gauge is minimized by

- (A) decreasing the size of screw (B) increasing the size of screw
~~(C)~~ greasing the screw (D) pressuring the screw

167. The principal disadvantage of Piezo electric transducer is that

- (A) it needs external power ~~(B)~~ it cannot measure static pressure
(C) life time is less (D) needs an airconditioned environment

168. The extension wires of an iron-constantan thermocouple were improperly wired shown in Fig. The voltmeter calibrated in $^{\circ}\text{C}$ will then read

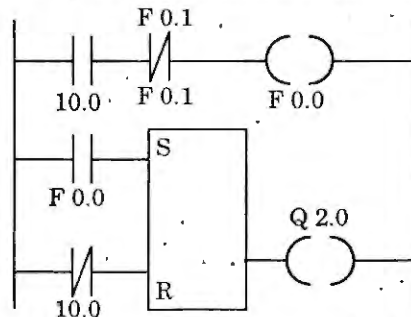


- (A) 240°C (B) 180°C (C) 140°C (D) 120°C
169. An acceleration in Piezo-electric accelerometer in the _____ direction would increase the _____ on the crystal in proportion to the acceleration.
- (A) upward, velocity (B) downward, velocity
 (C) upward, force (D) downward, force
170. The leads from the strain gauge's accelerometer are taken to a wheatstone bridge whose output indicates the
- (A) acceleration between the mass and housing form
 (B) relative acceleration between the mass and housing form
 (C) displacement between the mass and housing form
 (D) relative displacement between the mass and the housing form
171. A nozzle flowmeter has a pressure drop of 200 mm of water for a flow rate of 100 L/min. For a pressure drop of 400 mm of water, the flow rate is
- (A) 141 L/min (B) 165 L/min (C) 200 L/min (D) 362 L/min
172. Which of the following accessory is commonly used in the installation of a pressure measuring device under pulsating condition?
- (A) Diaphragm seal (B) Siphon
 (C) Snubber (D) 3-valve manifold
173. A thermocouple with its reference junction exposed to room temperature of 20°C gives an open circuit voltage of 5 mV. If the thermocouple has temperature sensitivity of $50\ \mu\text{V}/^{\circ}\text{C}$, the measured temperature is
- (A) 100°C (B) 120°C (C) 80°C (D) 20°C
174. The wavelength at which the target body is radiating at its peak energy is $2.28\ \mu\text{m}$. The expected temperature of the body is
- (A) 273°C (B) 1273°C (C) 1000°C (D) 1500°C

175. Fatigue and saturation in Photo Multiplier Tube (PMT) occur at _____ illumination level.
 (A) high (B) low (C) medium (D) decreased
176. The grating has
 (A) 1000 lines/mm (B) 1100 lines/mm (C) 1200 lines/mm (D) 1300 lines/mm
177. The Nichrome strip temperature is about
 (A) 600 – 700° C (B) 700 – 800° C (C) 800 – 900° C (D) 900 – 1000° C
178. Transfer function of transportation lag is
 (A) e^{Ts} (B) e^{-Ts} (C) $\frac{1}{T_{s+1}}$ (D) $\frac{1}{T_s}$
179. A deadbeat algorithm is referred as the one that requires the closed-loop response to have
 (A) Finite settling time, maximum rise time and zero-steady state error
 (B) Finite settling time, minimum rise time and zero-steady state error
 (C) Maximum settling time, minimum rise time and finite-steady state error
 (D) Minimum settling time, finite rise time and finite-steady state error
180. Which one of the following is not the feature of Dahlin's algorithm?
 (A) Same as that of internal model control for first-order plus dead time processes
 (B) Robustness of the loop in the presence of modeling errors
 (C) Improves dynamic response with sensitive to modeling errors
 (D) Suitable for processes with inverse response
181. Z-transformation of $[e^{-at}]$ is equivalent to
 (A) $\sum_{n=0}^{\infty} e^{-anT} 3^{-n}$ (B) $\sum_{n=0}^{\infty} e^{anT} 3^{-n}$ (C) $\sum_{n=0}^{\infty} e^{-anT} 3^n$ (D) $\sum_{n=0}^{\infty} e^{anT} 3^n$
182. _____ control anticipates future errors and introduce appropriate action.
 (A) On/Off (B) Proportional
 (C) Integral (D) Derivative
183. For a multicapacity process whose response is very sluggish, the addition of a _____ controller makes it even more sluggish.
 (A) On/Off (B) P (C) PI (D) PIn
184. In On/Off controller if the differential gap is _____ the control value life will be _____
 (A) small, decreased (B) small, increased
 (C) large, decreased (D) large, increased

185. In the following pacemakers which one is the demand pacemaker?
 (A) Atrial synchronous pacemaker (B) Ventricular inhibited pacemaker
 (C) Ventricular synchronous pacemaker (D) Ventricular asynchronous pacemaker
186. In the following pacemakers which one is the programmable pacemaker?
 (A) Ventricular inhibited pacemaker
 (B) Atrial synchronous pacemaker
 (C) Atrial sequential ventricular inhibited pacemaker
 (D) Ventricular asynchronous pacemaker
187. Battery operated pacemakers are safer because
 (A) Minimum power is required
 (B) Maximum power is required
 (C) Minimum leakage current present
 (D) Leakage currents are not present and the pacemaker can be used without power chord
188. In pulse duration modulation, the magnitude of all the pulse remain _____ but the duration of the pulse varies.
 (A) increasing (B) decreasing
 (C) constant (D) ∞
189. Synchro transmitter and receiving is a _____ telemetry system.
 (A) position (B) motion (C) force (D) current
190. In a _____ system the slide wire is replaced by a LVDT.
 (A) Motion balance (B) Position balance
 (C) Current telemetry (D) Force balance
191. In amplitude modulation the bandwidth is _____ the frequency of message signal.
 (A) thrice (B) twice
 (C) same as (D) fourth times
192. In pulse telemetry system, the measurement is transmitted in terms of _____ rather than the magnitude of an electrical quantity.
 (A) displacement (B) time
 (C) velocity (D) acceleration
193. If $x = \sqrt{-1}$, then the value of X^x is
 (A) $e^{-\pi/2}$ (B) $e^{\pi/2}$ (C) x (D) 1

194. Which of the following signal is used when a peripheral device request the microprocessor to have a DMA operation?
 (A) $\overline{IO/M}$ (B) READY
 (C) HOLD and HLDA (D) \overline{RD} and \overline{WR}
195. A single instruction to clear the lower four bits of the accumulator in 8085 assembly language is
 (A) XRI OFH (B) ANI FOH (C) XRI FOH (D) ANI OFH
196. The BCD code for digit _____ is first output from Part B to the 7447.
 (A) 0 (B) 1 (C) 10 (D) 11
197. The _____ signal in printer indicates that the data character has been accepted and the printer is ready for the next character.
 (A) PE (B) SLCT (C) Busy (D) ACKNLG
198. For data transfer where even more coordination is required between the sending and the receiving system a _____ is used in 8255 A.
 (A) Single handshake (B) Double handshake
 (C) Triple handshake (D) No handshake
199. For the ladder diagram shown in figure, when there is an input to 10.0, the output Q 2.0 is



- (A) Comes on and remains on as long as input is available
 (B) Comes on and remains on
 (C) Goes on and remains off for one cycle
 (D) Goes off and remains off
200. The following PLC program is
-
- (A) updown counter (B) high speed counter
 (C) counter with separate enable (D) counter with reset