Q1. Equipotential surfaces about a pair of equal and opposite linear charges exist in what form?

(A) Concentric spheres
(B) Concentric cylinders
(C) Non-concentric cylinders
(D) Planes

Q2. Point charges of -10nC and 10nC are located in free space at (-1, 0, 0)m and (1, 0, 0)m respectively. What is the energy stored in the field?

(A) Zero
(B) 450nJ
(C) - 450nJ
(D) - 900nJ

Q3. The 2’s complement representation in 8-bit format is 11001110. The equivalent hexadecimal representation is

(A) -32
(B) 32
(C) -52
(D) 52

Q4. Complement of data can be obtained from

(A) NOR gate by controlling the input by either setting LOW or having same to data.
(B) NAND gate by controlling the input by either setting HIGH or having same to data.
(C) EX-NOR gate by controlling the input by either setting LOW to data.
(D) all of above

Q5. How many 1-to-4 lines Demultiplexers are needed to design 1-to-256 lines Demultiplexer?

(A) 64
(B) 85
(C) 128
(D) 256

Q6. 32 number of 512×1 bit RAM IC are arranged in 4 rows and 8 columns to get memory of

(A) 1kB
(B) 2kB
(C) 4kB
(D) 8kB

Q7. The maximum conversion time that an ADC can have, if it is used to convert signals in the range of 1kHz to 50kHz.

(A) 1 milliseconds
(B) 1 microseconds
(C) 10 microseconds
(D) 10 milliseconds

Q8. Which pin of 8085 microprocessor is tri-stated and output?

(A) SOD
(B) HOLD
(C) $\overline{INTA}$
(D) $\overline{RD}$

Q9. In the Processor Status Word (PSW) of microprocessor, the accumulator, carry flag and auxiliary carry flag are cleared after the execution of:

(A) ANA A instruction
(B) XRA A instruction
(C) ADD A instruction
(D) SUB A instruction

Q10. Total charge entering a terminal is given by $q = 5t \sin 4\pi t \; mC$. What is the current at t=0.5s?

(A) 34.21 mA
(B) 32.42 mA
(C) 31.42 mA
(D) 32.14 mA

Q11. A 10 V battery with an internal resistance of 1Ω is connected across a non-linear load whose characteristic is given by The current delivered by battery is

(A) 2.5A
(B) 5A
(C) 6A
(D) 7A

Q12. What values of L and C should be used in a tank circuit to obtain a resonant frequency of 8 kHz? The bandwidth must be 800 Hz. The winding resistance of the coil is 10Ω.

(A) 1.99 mH, 0.2μF
(B) 1.99 mH, 10μF

(C) 2mH, 1μF
(D) 10H, 0.2μF

Q13. Size of decoder needed to design 16-to-1 line multiplexer.
(A) 2-to-4 lines decoder
(B) 3-to-8 lines decoder
(C) 4-to-16 lines decoder
(D) 5-to32 lines decoder

Q14. An RLC series circuit has a resistance R of 20 ohms and a current which lags behind the applied voltage by 45 degrees. If the voltage across the inductor is twice the voltage across capacitor, what is the value of inductive reactance?
(A) 10 ohms
(B) 20 ohms
(C) 40 ohms
(D) 60 ohms

Q15. A digital voltmeter has a read-out range from 0 to 9999 counts. The resolution of the instrument in volt when full scale reading is 9.999V is
(A) 10 mV
(B) 1 mV
(C) 0.1 mV
(D) 0.01 mV

Q16. The dead zone in a certain pyrometer is 0.125 percent of span. The calibration is 400 degrees centigrade to 1000 degrees centigrade. What temperature change might occur before it is detected?
(A) 0.25 degree centigrade
(B) -0.50 degree centigrade
(C) 1.25 degree centigrade
(D) 0.75 degree centigrade

Q17. The advantage of Hay's bridge over Maxwell's Inductance capacitance bridge is because
(A) It's equation for balance do not contain any frequency term.
(B) It can be used for measurement of inductance of high Q coils.
(C) It can be used for measurement of inductance of low Q coils.
(D) All of the above

Q18. A d' Arsonal movement has a sensitivity of 40000 ohm/volt and it's internal resistance is 4000 ohm. The resistance of multiplier to convert it to 1 Volt voltmeter is

(A) 44000 ohm
(B) 36000 ohm
(C) 3600 ohm
(D) 4400 ohm

Q19. There are two PMMC voltmeters. Meter A has a range of 0-10V and a multiplier resistance of 18 kilo ohm. Meter B has a range of 0-300V and a multiplier resistance of 298 kilo ohm. Both the meter movements have a resistance of 2 kilo ohm. Out of the above two meters mentioned, the meter having greater sensitivity is

(A) Meter A
(B) Meter B
(C) Both are equally sensitive
(D) can't be determined

Q20. Three types of temperature transducers are compared as regard to their sensitivity. The order in which they exhibit their sensitivities (highest to lowest) is

(A) Thermistors, RTDs, and Thermocouples
(B) Thermocouples, RTDs, and Thermistors
(C) RTDs, Thermistors, and Thermocouples
(D) RTDs, Thermocouples, and Thermistors

Q21. The reverse bias breakdown of high speed silicon transistors is due to

(A) Avalanche breakdown mechanism at both the junctions
(B) Zener breakdown mechanism at both the junctions
(C) Zener breakdown mechanism at base-collector junction
(D) Zener breakdown mechanism at base-emitter junction

Q22. Consider the following statements

FET when compared to BJT have

1. High input impedance
2. Current flow due to majority carriers
3. Low input impedance
4. Current flow due to minority carriers

(A) 1 and 4

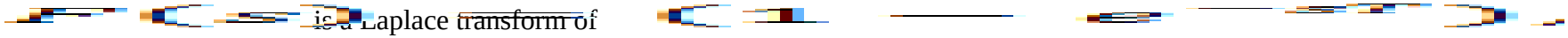
(B) 2 and 3
(C) 3 and 4
(D) 1 and 2

Q23. A diode is very useful for rectifiers circuits due to its
(A) ability to conduct current only in one direction
(B) ability to given current in both directions
(C) zero resistance in both directions
(D) none of these

Q24. The ideal characteristics of a voltage stabilizer is
(A) constant output voltage with low internal resistance
(B) constant output current with low internal resistance
(C) constant output voltage with high internal resistance
(D) constant internal resistance with variable output voltage

Q25. Which of the following are the non-linear applications of OP-Amp?
1. current-to-voltage converter
2. Comparator
3. Peak detector
4. Limiter

Select the correct answer from the codes given below
(A) 1, 2 and 3
(B) 2, 3 and 4
(C) 1, 3 and 4
(D) 1, 2 and 4

Q26.  is a Laplace transform of
(A) a pulse of width T
(B) a square wave of period T
(C) a unit step delayed by T
(D) a ramp delayed by T

Q27. A transfer function has two zeros at infinity. Then the relation between the numerator degree (N) and the denominator (M) of transfer function is
(A) N=M + 2

(B) N=M - 2
(C) N=M + 1
(D) N=M – 1

Q28. If the open loop transfer function of negative feedback control system is

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

Q29. Insertion of negative feedback in control system affects
(A) the transient response to vanish uniformity
(B) the transient response to decay very fast
(C) no change in transient response
(D) the transient response decays at a slow rate.

Q30. A ramp input applied to a unity feedback system results in 5% steady state error. The type number and zero frequency gain of the system are respectively
(A) 1 and 20
(B) 0 and 20
(C) 0 and 0.05
(D) 1 and 0.05

Q31. Which of the following requires that the slots in a squirrel cage rotor be skewed?
(A) need to reduce hum during running
(B) need to avoid magnetic locking at starting
(C) need to produce more uniform torque
(D) all of these

Q32. The magnitude of the current drawn by an induction motor on no load as a percentage of the full load current, is
(A) up to 5%.
(B) up to 15%.
(C) up to 30%
(D) up to 40%.

Q33. It is, desired to select a dc motor for mining hoists. Which of the following motors is appropriate?

(A) series motor

(B) cumulative compound motor

(C) differential compound motor

(D) shunt motor

Q34. The backward rotor slip in a single phase induction motor is equal to

(A) $1 - s$

(B) s

(C) $2 - s$

(D) $s/2$

Q35. In a 20-bus power system, the size of admittance bus matrix is

(A) 19 × 19

(B) 20 × 20

(C) 21 × 21

(D) 40 × 40

Q36. In a load flow solution $V_1 = 1.083\angle 15°$ pu and $V_2 = 0.986\angle -2°$ pu. What is the direction of P and Q flow in the line 1-2?

(A) P and Q flows from 1 to 2

(B) P flows from 1 to 2 and Q flows from 2 to 1

(C) P and Q flows from 2 to 1

(D) Data is insufficient to determine the flow.

Q37. In a line to ground fault on a system, the fault current is 1500A. The zero-sequence current is

(A) 1500A

(B) Zero A

(C) 750A

(D) 500A

Q38. In an unloaded generator operating at rated voltage, it is observed that the magnitude of fault current for L-G fault is same as a three-phase fault. The reactances of generator are $X_1 = X_2 = 0.15$ pu; $X_0 = 0.04$ pu. For the above condition, the value of the neutral grounding reactance is

(A) 0.367 pu

(B) 0.0367 pu

(C) 6.667 pu

(D) 0.1 pu

Q39. An LTI system is described by following difference equation:

$y[n] = x[n + 1] + x[n - 1] – x[n - 2]$

where y[n] and x[n] are the output and input respectively. The system is

(A) casual and stable

(B) stable but non-casual

(C) causal but not stable

(D) unstable and non-casual

Q40. A system is said to be BIBO stable if bounded inputs always results in bounded outputs. By this definition

(A) an integrator is stable but a differentiator is not.

(B) a differentiator is stable but an integrator is not.

(C) neither the differentiator nor the integrator is stable.

(D) both the differentiator and integrator are stable.

$$7i = v^2 + 2v$$

$$G(s)H(s) = \frac{K}{(s+1)^3}$$

Q.No.	Answer
1	D
2	C
3	A
4	D
5	B
6	B
7	C
8	D
9	B
10	C
11	B
12	A
13	C
14	C
15	B
16	D
17	B
18	B
19	A
20	A
21	D
22	D
23	A
24	A
25	B
26	A
27	B
28	A
29	B
30	A
31	D
32	D
33	B
34	C
35	B
36	A
37	D
38	B
39	B
40	C