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Paper : VPITI-Electrical

Ques # :1

Maxwell's divergence equation for the magnetic field is given by:

1) $\nabla \times B = 0$

2) $\nabla . B = 0$

3) $\nabla \times B = P$

4) $\nabla . B = P$

Ques # :2

Transfer function $\frac{V_2(s)}{V_1(s)} = \frac{10s}{s^2 + 10s + 100}$

is for an active:

1) Low pass filter
2) Band pass filter
3) High pass filter
4) All pass filter

Ques # :3

Two coils in differential connection have self inductance of 2 milli Henry (mH) and 4 mH and a mutual inductance of 0.15 mH. The equivalent inductance of the combination is :-

1) 5.7 mH
2) 5.85 mH
3) 6 mH
4) 6.15 mH

Ques # :4

Power input to a transformer on no load at rated voltage comprises predominantly:-

1) Copper loss

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2) Hysteresis loss
3) Core loss
4) Eddy current loss

Ques # :5

The Q - factor of a coil is given by :-

1) Its power factor cos ϕ

2) Ratio of max. Energy stored & energy dissipated per cycle
3) Reciprocal of its power factor
4) Ratio R/Z

Ques # :6

If an induction machine is run at above synchronous speed, it acts as:

1) a synchronous motor
2) an induction generator
3) an induction motor
4) none of the above

Ques # :7

The majority charge carriers in a P-type semiconductor are :-

1) Electrons
2) Holes
3) Neutrons
4) Ions

Ques # :8

Signal flow graph is used to obtain the:-

1) stability of the system
2) transfer function of the system
3) controllability of the system
4) observability of the system

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Ques # :9

A synchronous machine with small short circuit ratio (SCR) will have:
1) poor inherent voltage regulation
2) lower stability limit
3) difficult to operate in parallel
4) all of the above

Ques # :10

Within the boiler of Thermal Power Station, the steam has highest temperature in:
1) water tubes
2) water walls
3) water drum
4) superheater

Ques # :11

Which of the following distribution systems is preferred for good efficiency and high economy ?
1) single phase, 2-wire system
2) two phase, 3-wire system
3) three phase, 4-wire system
4) three phase, 3-wire system

Ques # :12

The type of power amplifier which exhibits crossover distortion in its output is:
1) Class A
2) Class B
3) Class AB
4) Class C

Ques # :13

In a synchronous machine, if the field flux is ahead of the armature field flux in the direction of rotation, the machine works as:-
1) asynchronous motor
2) asynchronous generator
3) synchronous motor

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4) synchronous generator

Ques # :14

The 'Transfer Function' of the system is

$$F(s) = \frac{10s}{s^2 + 10s + 100}.$$

The phase shift at ω = 0, and ω = - ∞ will be:

1) 90^0 and 0^0
2) -180^0 and 180^0
3) -90^0 and 70^0
4) None of these

Ques # :15

If the characteristic equation of a closed-loop system is $s^2+2s+2 = 0$, then the system is :-

1) overdamped
2) critically damped
3) underdamped
4) undamped

Ques # :16

An instantaneous change in voltage is not possible in a: -

1) resistor
2) capacitor
3) inductor
4) current source

Ques # :17

The function "fprintf" is used in a program:-

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1) When too many printf calls have been already used in the program
2) In place of printf, since printf uses more memory.
3) When the output is to be printed on to a file
4) When the type of variables to be printed are not known before

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Ques # :18

'C' language allows a three-way transfer of control with the help of
1) unary operator
2) relational operator
3) ternary operator
4) comparison operator

Ques # :19

In 8086 microprocessor, Example for "Non Maskable" interrupts are:
1) TRAP
2) RST
3) INTR
4) RST6.6

Ques # :20

With regard to microprocessor, ALE stands for _____:
1) address latch enable
2) address level enable
3) address leak enable
4) address leak extension

Ques # :21

An equipment has a per unit impedance of 0.9 pu to a base of 20 MVA, 33 kV. The pu impedance to a base of 50 MVA and 11 kV will be:
1) 4.7
2) 20.25
3) 0.9
4) none to these

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Ques # :22

Unsigned integer in 'C' language occupies:-

1) Two bytes
2) Four bytes
3) One byte
4) Eight bytes

Ques # :23

Which one of the following is not done by the use of bundled conductors in transmission line ?

1) Control of voltage gradient
2) Reduction in corona loss
3) Reduction in radio interference
4) Increase in interference with communication lines

Ques # :24

As compared to a closed loop system, an open loop system is:-

1) more stable as well as more accurate
2) less stable as well as less accurate
3) more stable but less accurate
4) less stable but more accurate

Ques # :25

Two infinite parallel metal plates are charged with equal surface charge density of the same polarity. The electric field in the gap between plates is:

1) the same as that produced by one plate
2) double of the field produced by one plate
3) dependent on coordinates of field point
4) zero

Ques # :26

The period of the function Cos $[(\pi / 4)(t - 1)]$ is:

1) 1/8 second

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2) 8 second
3) 4 second
4) 1/4 second

Ques # :27

A single-phase transformer is to be switched to the supply to have minimum inrush current. The switch should be closed at:

1) maximum supply voltage
2) zero supply voltage
3) $\frac{1}{\sqrt{2}}$ maximum supply voltage
4) 1/2 maximum supply voltage

Ques # :28

Natural frequency of a unity feedback control system of transfer function $G(s) = \frac{10}{s(s+1)}$ is:

1) 3.16 rad/ second
2) 0.5 rad/ second
3) 4.6 rad/ second
4) none of these

Ques # :29

The nodal method of circuit analysis is based on:

1) KVL and Ohm's law
2) KCL and Ohm's law
3) KCL and KVL
4) KCL, KVL and Ohm's law

Ques # :30

A Kelvin double bridge is best suited for the measurement of:

1) inductance

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2) capacitance
3) low resistance
4) high resistance

Ques # :31

For even function, the necessary condition is:

1) $f(t)=-f(-t)$

2) $f(t)=+f(-t)$

3) $f(t)=\frac{1}{f(-t)}$

4) $f(t)=-(t\pm\frac{T}{2})$

Ques # :32

A practical current source is represented by:

1) a resistance in series with an ideal current source
2) a resistance in parallel with an ideal current source
3) a resistance in parallel with an ideal voltage source
4) none of these

Ques # :33

Which is not true out of following in the context of Java?

1) The operating system periodically deletes all of the java files available on the system
2) Any package imported in a program and not used is automatically deleted.
3) When all references to an object are gone, the memory used by the object is automatically reclaimed
4) The JVM checks the output of any Java program and deletes anything that doesn't make sense

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Ques # :34

In an induction motor, if the air gap is increased

1) speed will reduce

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2) efficiency will improve
3) power factor will be lower
4) breakdown torque will reduce

Ques # :35

A material best suited for manufacturing of fuse wire is:
1) Silver
2) Copper
3) Aluminium
4) Zinc

Ques # :36

In an induction type of meter, maximum torque is produced when the phase angle, between the two fluxes is:
1) 0^{o}
2) 45^{o}
3) 60^{o}
4) 90^{o}

Ques # :37

The rating of a circuit breaker is usually determined on the basis of …….. fault.
1) symmetrical 3-phase
2) line to line
3) single line to ground
4) double line to ground

Ques # :38

If the time of operation of a time delayed overcurrent relay for unity time dial setting (TDS) is 10 second; then for same plug setting multiplier and other conditions being identical, time of operation of relay for 0.4 TDS will be:

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1) 4 second
2) 25 second
3) 10 second
4) None of these

Ques # :39

Two alternating voltage quantities are represented by
$e1 = 60 \sin (wt-30^0)$ and $e2 = 10 \cos (wt)$, then

1) e1 lags e2 by 30^0
2) e2 leads e1 by 60^0
3) e1 leads e2 by 60^0
4) e2 leads e1 by 120^0

Ques # :40

The resolution of a D/A converter is approximately 0.4 % of its full-scale range. It is:
1) a 8 - bit converter
2) a 10 - bit converter
3) a 12 - bit converter
4) a 16 - bit converter

Ques # :41

By adding resistance in the rotor circuit of a slip ring induction motor, the starting current:
1) and torque both reduce (compared to direct on-line starting)
2) and torque both increase
3) reduces but starting torque increases
4) increases but starting torque decreases

Ques # :42

A DC series motor is best suited for driving :-
1) Lathes

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2) Cranes and hoists
3) Shears and punchaes
4) Machine tools

Ques # :43

If a function f(t) is shifted by 'a', then it is correctly represented as:
1) f (t - a) U (t)
2) f (t) U (t - a)
3) f (t - a) U (t - a)
4) f (t - a) (t - a)

Ques # :44

Steepness of a travelling wave is attenuated by:
1) line resistance
2) line inductance
3) line capacitance
4) both line inductance and line capacitance

Ques # :45

For a 15-bus power system with 3 voltage controlled bus, the size of Jacobian matrix is:
1) 11 x 11
2) 12 x 12
3) 19 x 19
4) 28 x 28

Ques # :46

By increasing the transmission voltage to double of its original value, the same power can be despatched keeping the line loss:
1) equal to original value
2) half the original value
3) double the original value
4) one-fourth of original value

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Ques # :47

The electric field lines and equipotential lines:
1) are parallel to each other
2) are one and the same
3) cut each other orthogonally
4) can be inclined to each other at any angle

Ques # :48

A compensated wattmeter has its reading corrected for error due to:
1) the frequency
2) friction
3) power consumed in current coil
4) power consumed in pressure coil

Ques # :49

The MOSFET switch in its on-state may be considered equivalent to:
1) resistor
2) inductor
3) capacitor
4) battery

Ques # :50

A certain meter has a sensitivity of 50,000 ohm/V. The current required to deflect the meter movement to full-scale will be :-
1) 5 Micro ampere
2) 10 Micro ampere
3) 20 Micro ampere
4) 50 Micro ampere

Ques # :51

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Laplace Transform of the function i(t) is

$$I(s) = \frac{10s + 4}{s(s + 1)(s^2 + 4s + 5)}$$

Its Final Value will be:

1) 4/5
2) 5/4
3) 4
4) 5

Ques # :52

The Wheatstone bridge method of resistance measurement is ideally suitable for the measurement of resistance values in the range of:

1) 0.001 Ohm to 1 Ohm
2) 0.1 Ohm to 100 Ohm
3) 100 Ohm to 10 kilo Ohm
4) 100 kilo Ohm to 10 Mega Ohm

Ques # :53

The mobility of an electron in a conductor is expressed in terms of:

1) cm^2/ Volt-Second
2) cm/ Volt-Second
3) cm^2/ Volt
4) cm^2/ Second

Ques # :54

A 40 kVA transformer has a core loss of 400 Watt and a full-load copper loss of 800 Watt. The proportion of full-load at maximum efficiency is:

1) 50%
2) 62.3%

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3) 70.7%
4) 100%

Ques # :55

For a long uncompensated line, the limit to the line loading is governed by:
1) thermal limit
2) voltage drop
3) stability limit
4) corona loss

Ques # :56

Two two-port networks are connected in cascade. The combination is to be represented as a single two-port network. The parameters of the network are obtained by multiplying the individual:
1) z-parameter matrix
2) h-parameter matrix
3) y-parameter matrix
4) ABCD parameter matrix

Ques # :57

A generating station has a maximum demand of 50 MW, a load factor of 60 %, a plant capacity factor of 45 %. If the plant while running is fully loaded, the daily energy produced will be:
1) 400 MW
2) 720 MW
3) 500 MW
4) 600 MW

Ques # :58

For transfer of maximum power in a single-phase line from one end to the other:
1) resistance of the line should be 1.732 times its reactance.
2) resistance of the line should be three times its reactance.
3) reactance of the line should be three times its resistance.
4) reactance of the line should be 1.732 times its resistance

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Ques # :59

For a DC voltage, an inductor

1) is virtually a short-circuit
2) is an open-circuit
3) depends on polarity
4) depends on voltage value

Ques # :60

If each branch of a Delta circuit has impedance $\sqrt{3}Z$ then, each branch of the equivalent Star (Wye) circuit has impedance:

1) $\frac{Z}{\sqrt{3}}$
2) $3Z$
3) $3\sqrt{3}Z$
4) $\frac{Z}{3}$

Ques # :61

Load frequency controller is …. ….. and excitation voltage controller is …. ……

1) fast acting, slow acting
2) fast acting, fast acting
3) slow acting, fast acting
4) slow acting, slow acting

Ques # :62

Whenever the conductors are dead-ended or there is a change in the direction of transmission line, the insulators used are of the:

1) pin type

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2) suspension type
3) strain type
4) shackle type

Ques # :63

As compared to cylindrical pole type rotors, salient pole type rotors are:
1) smaller in diameter and larger in axial length
2) larger in diameter and smaller in axial length
3) larger in diameter and as well as in axial length
4) smaller in diameter and as well as in axial length

Ques # :64

Deflection of hot-wire instruments depends upon
1) rms value of AC current
2) rms value of AC voltage
3) average value of AC current
4) average value of AC voltage

Ques # :65

“Graetz” circuit is mainly used in:
1) EHV AC transmission
2) HVDC transmission
3) Flexible transmission
4) 220/ 220 kV

Ques # :66

Which of the following does not cause permanent damage of an SCR ?
1) high current
2) high rate of rise of current
3) high temperature rise
4) high rate of rise of voltage

Ques # :67

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"Crawling" in an induction motor is due to:

1) time harmonics in supply
2) slip ring rotor
3) space harmonics produced by winding currents
4) insufficient starting torque

Ques # :68

The impulse response of an R-L circuit is a:

1) rising exponential function
2) decaying exponential function
3) step function
4) parabolic function

Ques # :69

When a charge is given to a conductor:

1) It distributes uniformly all over the surface of the conductor
2) It distributes uniformly all over the volume of the conductor
3) It distributes uniformly all over the surface of the conductor, inversely proportional to the radius of curvature
4) It stays where it was placed

Ques # :70

The two windings of a transformer have an Inductance of 2 Henrys each. If the mutual inductance between them is also 2 Henry, then

1) the transformer is able to change the frequency to secondary side
2) the turn ratio of transformer is also two
3) the transformer is a perfect transformer
4) none of these

Ques # :71

"Creep" in energy meters can be prevented by:

1) using extra turns on the voltage coil
2) having two holes on opposite sides of the disc
3) using a stronger brake magnet

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4) using steel laminations of high permeability

Ques # :72

Which of the following is not a keyword in Java

1) transient
2) emun
3) strictfp
4) instanceof

Ques # :73

In identical conditions, ratio of resistances of a 100 W, 220 V lamp to that of a 100 W, 110 V lamp will be:

1) 4
2) 2
3) 1/2
4) 1.4

Ques # :74

The power in a three phase four wire circuit can be measured by using:

1) 2 Wattmeters
2) 4 Wattmeters
3) 3 Wattmeters
4) 1 Wattmeter

Ques # :75

The scale of the voltmeter is uniform. Its type is:

1) moving iron
2) induction
3) moving coil permanent magnet
4) moving coil dynamometer

Ques # :76

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Andersen bridge is used for the measurement of
1) time period
2) phase difference
3) inductance
4) capacitance

Ques # :77

The depth of penetration of wave in a lossy dielectric increases with increasing:
1) conductivity
2) permeability
3) wavelength
4) permittivity

Ques # :78

The theorem that enables a number of voltage ((or current) sources to be combined directly into a single voltage (or current) source is:
1) compensation
2) reciprocity
3) Millman's
4) Maxwell's

Ques # :79

An ideal synchronous motor has no starting torque because the:
1) rotor is made up of salient poles
2) relative velocity between the stator and rotor mmf's is zero
3) relative velocity between the stator and rotor mmfs is not zero
4) rotor winding is highly reactive

Ques # :80

Which of the following theorems is applicable for both linear and non-linear circuits ?
1) Superposition
2) Thevenin's
3) Norton's
4) None of these

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Ques # :81

A dynamometer type wattmeter responds to:

1) average value of active power
2) average value of reactive power
3) peak value of active power
4) peak value of reactive power

Ques # :82

A set of linear equations is represented by the matrix equation "Ax = b". The necessary condition for the existence of a solution for this linear equation set of matrix 'A' and 'b' is:

1) 'A' matrix must be invertible
2) 'b' must be linearly dependent on the columns of 'A'
3) 'b' must be linearly independent on the columns of 'A'
4) none of these

Ques # :83

Five cells are connected in series in a row and then four such rows are connected in parallel to feed the current to a resistive load of 0.125 Ohm. Each cell has emf of 1.5 Volt with internal resistance of 0.2 Ohm. The current through the load will be:

1) 3.33 Ampere
2) 23.33 Ampere
3) 4 Ampere
4) 1 Ampere

Ques # :84

A network contains linear resistors and ideal voltage sources. If values of all the resistors are doubled, then the voltage across each resistor is:

1) halved
2) doubled
3) increased by four times
4) not changed

Ques # :85

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The output of a logic gate is '1' when all its inputs are at logic '0'. The gate is either:

1) a NAND or an EX-OR gate
2) a NOR or an EX-NOR gate
3) a OR or an EX-NOR gate
4) a AND or an EX-OR gate

Ques # :86

The DC gain of a system represented by the transfer function $\frac{10}{(s+1)(s+2)}$ is:

1) 1
2) 2
3) 5
4) 10

Ques # :87

The surge impedance of a 400 kilometer long overhead transmission line is 400 Ohm. For a 200 kilometer length of the same line, the surge impedance will be:

1) 200 Ohm
2) 800 Ohm
3) 400 Ohm
4) 100 Ohm

Ques # :88

A network has 7 nodes and 5 independent loops. The number of branches in the network is:

1) 13
2) 12
3) 11
4) 10

Ques # :89

The critical clearing time of a power system is improved by:

1) reactive power limit

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2) short-circuit current limit
3) steady-state stability limit
4) transient stability limit

Ques # :90

A DC voltmeter has a sensitivity of 1000 Ohm per Volt. When it measures half full scale in 100 Volt range, the current through the voltmeter will be:
1) 100 mA
2) 1 mA
3) 0.5 mA
4) 50 mA

Ques # :91

The damping winding in a synchronous motor is generally used
1) to prevent hunting and provide the starting torque
2) to reduce eddy currents
3) to minimize vibrations
4) to reduce noise level

Ques # :92

Superposition theorem is not applicable in networks containing
1) non-linear elements
2) dependent voltage sources
3) dependent current sources
4) transformers

Ques # :93

The high torque to weight ratio in an analog indicating instrument indicates:
1) very high friction loss
2) low friction loss
3) nothing as regards friction loss
4) none of these

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Ques # :94

The Decimal equivalent of Hexadecimal number $(E5)_{16}$ is:

1) 279
2) 229
3) 427
4) 3000

Ques # :95

The applied voltage of a certain transformer is increased by 50 % while the frequency is reduced to 50 %. The maximum core flux density will:

1) become three times
2) become 1.5 times
3) become half
4) become the same

Ques # :96

In a DC transmission line

1) it is necessary for the sending end and receiving end to be operated in synchronism.
2) the effects of inductive and capacitive reactance are greater in the same rating AC transmission line as compared to that of DC line
3) there are no effects due to inductive and capacitive reactance
4) power transfer capability is limited by stability considerations

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Ques # :97

Open slots are used in DC machine armature because:

1) of the ease in which the winding can be placed inside the slots
2) it increases the induced emf per coil
3) it reduces the armature voltage drop
4) it reduces the coil reactance and hence aids in commutation

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Ques # :98

A voltage source inverter is normally employed when

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1) source inductance is large and load inductance is small
2) source inductance is small and load inductance is large
3) both source and load inductances are small
4) both source and load inductances are large

Ques # :99

The eigen values of the matrix A = $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ are:

1) 1, 1
2) -1,-1
3) j, -j
4) 1, -1

Ques # :100

The speed and torque of induction motors can be varied by which of the following means:
1) Stator voltage control
2) Rotor voltage control
3) Frequency control
4) All of these

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