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Paper : VPITI-Electrical

Ques # :1

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

1) $\nabla \times \mathbf{B} = \mathbf{0}$

2) $\nabla \cdot \mathbf{B} = \mathbf{0}$

3) $\nabla \times \mathbf{B} = \mathbf{P}$

4) $\nabla \cdot \mathbf{B} = \mathbf{P}$

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

- 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 $\cos \phi$**
 - 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
-

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

4) synchronous generator

Ques # :14

The 'Transfer Function' of the system is

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

The phase shift at $\omega = 0$, and $\omega = -\infty$ will be:

- 1) 90° and 0°
 - 2) -180° and 180°
 - 3) -90° and 70°
 - 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:-

- 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
-

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

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 $\cos \left[\left(\frac{\pi}{4} \right) (t - 1) \right]$ is:

- 1) 1/8 second

- 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

- 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
-

Ques # :34

In an induction motor, if the air gap is increased

- 1) speed will reduce

- 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°
- 2) 45°
- 3) 60°
- 4) 90°

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:

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

Ques # :39

Two alternating voltage quantities are represented by $e_1 = 60 \sin (\omega t - 30^\circ)$ and $e_2 = 10 \cos (\omega t)$, then

- 1) e_1 lags e_2 by 30°
 - 2) e_2 leads e_1 by 60°
 - 3) e_1 leads e_2 by 60°
 - 4) e_2 leads e_1 by 120°
-

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

- 2) Cranes and hoists
 - 3) Shears and punches
 - 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
-

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

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) $\text{cm}^2/\text{Volt-Second}$
- 2) $\text{cm}/\text{Volt-Second}$
- 3) cm^2/Volt
- 4) $\text{cm}^2/\text{Second}$

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%

- 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
-

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

- 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

“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

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

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

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

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

- 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
-

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

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

Ques # :98

A voltage source inverter is normally employed when

- 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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Exam Date 14-02-2016				
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SET_A	RES		SET_A	RES
1	2		51	1
2	2		52	3
3	1		53	1
4	3		54	3
5	2		55	3
6	2		56	4
7	2		57	2
8	2		58	4
9	4		59	1
10	4		60	1
11	3		61	3
12	2		62	3
13	4		63	2
14	4		64	1
15	3		65	2
16	2		66	1
17	3		67	3
18	3		68	2
19	1		69	1
20	1		70	3
21	2		71	2
22	2		72	2
23	4		73	1
24	3		74	3
25	4		75	3
26	2		76	3
27	1		77	3
28	1		78	3
29	2		79	3
30	3		80	4
31	2		81	1
32	2		82	2
33	3		83	3
34	3		84	4
35	1		85	2
36	4		86	3
37	1		87	3
38	1		88	3
39	4		89	4
40	1		90	3
41	3		91	1
42	2		92	1
43	3		93	2
44	1		94	2
45	4		95	1
46	4		96	3
47	3		97	4
48	4		98	2
49	1		99	4
50	3		100	4

* Means deleted