(DO NOT OPEN THIS QUESTION BOOKLET BEFORE TIME OR UNTIL YOU ARE ASKED TO DO SO)

В

Ph.D-EE-December, 2024 Electrical Engineering

SET-X

10000

		Sr. No
Time : 1¼ Hours Roll No. (in figures)	Max. Marks : 100 (in words)	Total Questions : 100
Name		
Father's Name	Mother's Name	·
Date of Examination		
		·
(Signature of the Candidate)		(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates must return the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
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- 5. The candidate *must not* do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers *must not* be ticked in the question booklet.
- 6. There shall be negative marking. A deduction of 0.25 marks shall be there for each wrong answer. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

1.	In a commutation circuit, satisfactory turn off of an SCR is obtained when: (1) Circuit turn-off time < Device turn-off time (2) Circuit time constant < Device turn-off time (3) Circuit turn-off time > Device turn-off time (4) Circuit time constant > Device turn-off time						
2.	10 1100 11 0110	ered device? Triac	(4) MOSFET				
3.	switching element:	at 20 kHz to 100) kHz range uses as main (4) UJT				
4.) Inverter) Multi-quadrant	Chopper				
5	(-) 8	manent damage to 2) High current 4) High temperate					
•	6. Which of the following Flip-flop circuits input state? (1) T (2) D	holds or toggles 3) JK	its output according to the (4) SR				
,	7. Two's complement of 0111 is: (1) 1000 (2) 1100	3) 1001	(4) 1010				
		nber gives its: (2) One's complet (4) None of the ab					
	9. If the inductance L is removed from the compared to previous case shall be:(1) less(2) more	ne load of any c	ircuit, the power drawn as (4) can't be said				
ħ	10. The RMS value of alternating current is a of: (1) charge transfer (2) heat generation Ph D FF December 2024/(Electrical Engs.)(S	(3) mass transfer	(4) voltage generation				

		(1) CEA	(2) PGCIL	(3) CERC	(4) POSOCO
	12.	Snubber circuit is ut (1) Rise of current (3) Conduction per		(2) Rise of volta(4) Commutation	age across device on period
	13.	of finer and outer of	outer conductor are between the densities is: (2) $a^2/(c^2-b^2)$		inner conductor is a, the ratio (4) (cb)/a ²
	14.	The following state (1) The wavelength in free space	ment is correct for u h λ is longer and vel	niform plane wave locity v is higher in	
		in free space			all real media than they are
		in free space	2 70 15 Shorter and ye	locity v is lower in	an real media than they are
	15.	A lossless dielectric	slab has $\varepsilon_{\rm R} = 9$. Its i	ntrinsic impedance	is:
		(1) $360 \pi\Omega$	$(2) 120 \pi\Omega$	(3) $40 \pi\Omega$	
	16.	If $D = 10 y^2 a_x + 0 < x, y, z < 1 m is$:	$10 x^2 y a_y + 15 a_z$, the total charge	enclosed within the region
		(1) 40/3 C	(2) 20/3 C	(3) 10/3 C _.	(4) 5/3 C
	17.	(1) The electric and(2) The electric and(3) The electric and		n the same direction perpendicular to each opposite to each oth	ch other er
	18.	The magnetic flux of between the iron sur B _g , the decrease in the	faces at this flux den	between two iron sity is F. If the flux	surfaces is B_g . The force density is reduced to $(3/4)$
		(1) (3/4) F	(2) (7/16) F	(3) (1/4) F	(4) None of the above
P	h.D-I	EE-December, 2024/	(Electrical Engg.)(Sl	ET-X)/(B)	····································

11. In India, which organisation performs the role of Independent System Operator:

19.	230 V, 50 Hz, the PIV required for SCRs shall be:					
	(1) 230 V	(2) 325 V	(3) 460 V	(4) 650 V		
20.	In a half-wave rect ripple at output, if the (1) 25 Hz	ne frequency of ac	supply is 50 Hz.	what is the frequency of ac		
	(1) 23 HZ	(2) 50 Hz	(3) 100 Hz	(4) Zero Hz		
21.	An alternator is said		d when it is operatir	ng at:		
	(1) Leading power		(2) Lagging po	wer factor		
	(3) Unity power fac	ctor	(4) None of the	ese		
22.	In a transformer hy	steresis and eddy	current losses depen	d upon:		
	(1) Load current		(2) Supply freq	luency		
	(3) Maximum flux	density	(4) (2) and (3)	both		
	 23. Role of power system stabilizer in excitation system is to: Provide de power to the synchronous machine field winding Processes and amplifies input current signal Provide an additional input signal to regulator to damp power system oscillation Provide an additional input signal to regulator to boost system frequency 24. Resistance switching is normally employed in: Bulk oil breakers Minimum oil breakers 					
	(3) SF6 circuit bre	State Section Se	(4) Air blast ci			
25	(1) In the phase w	ith arc current	(2) Lagging th	ne arc current by 90° ne arc current by 45°		
26	6. A negative sequen	ce relay is commo	only used to protect	: •		
	(1) Transformers		(2) Transmiss	ion lines		
	(3) Alternators		(4) Bus bar			
27. If the fault current is 3000 amps, the relay setting 50% and the C.T. ratio is 400/5, the the plug setting multiplier will be:						
	(1) 25 amps	(2) 15 amps	(3) 50 amps	(4) 30 amps		
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28.	In a HRC fuse the time between the cut off and the final current zero is called?						
	(1) Pre- arcing time	(2) Arcing time					
	(3) Total operating time	(4) Dead time					
29.	P. Bimetallic thermometer measures tem (1) 0 to 400°C (2) -40 to 1000°C	nperature in the following range: °C (3) 700 to 1500 °C (4) 45 to 500°C					
30.	Thermistor is a transducer. Its tempera (1) Negative (2) Positive						
31.	fails, assuming magnetic circuit syrwill be:	If supply to one terminal of three phase core type transformer connected in star-delta fails, assuming magnetic circuit symmetry, voltage on secondary side at no load					
	(1) 345, 115, 115 (2) 230, 115, 115	5 (3) 230, 230, 115 (4) 345, 0, 345					
32.	voltage and power rating of new config	volts, three phase delta connected core ty te as single-phase transformer. The maximum iguration shall be:	pe m				
		$(3) V_1/V_2, Q/3 \qquad (4) 2 V_1/V_2, 2Q/3$					
33.	3. An effectively grounded system has:						
	$(1) \ 0 \le X_0 / X_1 \le 3, R_0 / X_1 > 1$	() [[] [] [] [] []					
	(3) $0 \le X_0/X_1 \le 3, 0 \le R_0/X_1 \le 1$	$(4) \ 0 \le X_0 / X_1 \le 1, \ 0 \le R_0 / X_1 \le 3$					
34.	A 50 Hz 220/400, 50 kVA, single-phase transformer operates on 220 V, 40 Hz supply with secondary winding. Then: (1) The eddy current loss and hysteresis loss of the transformer increases (2) The eddy current loss and hysteresis loss of the transformer decreases (3) Hysteresis loss of the transformer increases while eddy current loss remains same (4) The eddy current loss decreases while hysteresis loss remains same.						
35.	according to Indian Standard specificati		1				
	$(1) \le 1.2 I_{\text{setting}} \qquad (2) \ge 1.3 I_{\text{setting}}$	$(3) \ge 1.5 I_{\text{setting}} \qquad (4) \ge 1.73 I_{\text{setting}}$					
36.	A fuse wire of circular cross-section wi What should be the radius of the wire to	ith 0.8 mm radius blows off at a current of 8 A. blow at a current of 1 A?					
	(1) 1.6 mm (2) 0.4 mm	(3) 0.2 mm (4) 0.1 mm					
Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(B)							

37.	In a biased differential relay the bias is do (1) Fault current and operating current (2) Operating coil current and restraining (3) Number of turns of restraining and o (4) Fault current and restraining coil cur	g coil current perating coil
38.	Why is it difficult to interrupt a capacitiv (1) Current magnitude is very small (2) The restriking voltage is very high (3) The current has a leading power fact (4) None of the above	
39.	. A differential relay measures the vector	difference between:
	(1) Two currents(2) Two voltages	
	(3) Two or more similar electrical quant(4) None of the above	tities
40.	. In an impedance relay, fault current is m	aximum if fault occurs near the:
	(1) Realy	(2) Center of the line
	(3) Transformer	(4) None of the above
41.	A wound rotor induction motor is prefuthe major consideration involved is:	erred over squirrel cage induction motor when
	(1) High Starting Torque	(2) Low Starting Torque
	(3) Limited range speed control	(4) All of these
42	2. The shunt resistance component in the induction motor, is representative of:	equivalent circuit obtained by no-load test of an
	(1) all losses	(2) Windage and friction losses
	(3) Core losses	(4) Copper losses
43	on it.	n motor has short circuited distributed windings
	b. The stator of squirrel cage induction	n motor has concentrated windings on it.
	(1) Statement a is true	(2) Statement b is true
	(3) Both are true	(4) None is true
Ph 1	D-FF-December, 2024/(Electrical Engg.)	(SET-X)/(B) P. T. O.

44.	a.	The starting torque of the three linearly.	e phase induction motor is zero and increases
	b.	The starting torque of a three additional rotor resistance.	phase induction motor can be increased with
	(1)	Statement a is true	(2) Statement b is true
		Both are true	(4) None is true
45.	a.	The DOL starter is used only for w	yound rotor type of three phase induction motor.
	b.	The DOL starter uses only "ON & starting current.	OFF" switches and does not have any control of
	(1)	Statement a is true	(2) Statement b is true
		Both are true	(4) None is true
46.	a.	The three phase induction motor characteristic zone.	is always operated in the negative Torque-slip
	b.	The negative Torque-slip charact towards zero slip.	eristic zone is beyond maximum torque point
		Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true
47.	a.	The slip is the difference of synchr induction motor.	onous speed and actual speed of the three phase
	b.	The slip is always proportional to to	orque of the three phase induction motor.
	(1)	Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true
48.	a.	The rotor of a three phase inducti 3000 rpm.	on motor generates rotating magnetic field at
	b.	The stator of a three phase, induction	on motor controls the slip of the rotor.
	(1)	Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true
49.	a.	The efficiency of a three phase induc	ction motor shall be less if the air gap is large.
	b.	The large air gap shall lead to poor p	ower factor in a three phase induction motor.
	` '	Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true

		The synchronous speed of a	lee ati	ion m	otor is depende	nt of frequency of voltage
50.	a.	The synchronous speed of a supply. The actual speed of the industrial speed o	n inducti	otor i	s dependent on	the number of poles of the
	b.	The actual speed of the indi	iction in	000.		
	(1)	motor. Statement a is true		(2)	Statement b is t	rue
		Both are true		(4)	None is true	
	• •					
51.		single diode operates as a :		(2)	Bridge Rectifie	r
	(3)	Capacitor Full Wave Rectifier		(4)	Half Wave Rec	etifier
	TT1.	e ratio of latching current / h	olding c	urren	t in a 20 thyristo	or shall be:
52.		Less than 1 (2) More	than 1	(3)	Equal to 1	(4) Any of these
53.	If ov	an AC voltage wave is cor erall voltage waveform diff		ith a	n arbitrary num undamental frec	ber of harmonics, then the quency component in terms
	of			(2)	Only the RMS	values
	(1)	Only the peak values Only the Average values			All of these	
54.	Th	e anode current through a c	onductin	g SC	R is 10A. If its	gate current is doubled, then
	the	e anode current shall be: (2) Doub	oled	(3)) Halved	(4) Same
	TI	o PMS value of resultant of	urrent in	ı a wi	re which carrie	s a dc current of 10 A and a
55.	si	nusoidal alternating current	of peak v	varuc	20 11, 10 .	
	(1) 14 1 A (2) 17.3	A	(3) 22.4 A	(4) 30 A
	(-	that dire	ctly conv	verts	polyphase AC	voltages from one frequency
56.	T	another frequency is known	as:	()		
				(2	2) Inverter	
) Cycloconverter S) Converter	, 53	(4	1) Chopper	
	(-) Converter	A.C. cour	rce is	s sunnlying to a	pure inductor, it will conduct
57.			AC SOUI	100, 18	2 24hb.1p	
		or: 1) 90° (2) 180°)	(3) 270°	(4) 360°
	(1) 90° (2) 180				•
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0		the inductive load with almost
	78. A single-phase diode bridge rectification ripple free current to the load. The A (1) sinusoidal (2) constant DC	er supplying a highly inductive load with almost C side current waveform shall be: (4) square
5	9. Snubber circuit is used to limit the R(1) Conduction period(3) Rise of voltage across device	ate of: (2) Commutation Period (4) Rise of Current
60	 An SCR is considered to be a semi-co It can be turned OFF but not ON It can be turned ON but not OFF It conducts during only half cycle It can be turned ON during only half 	by gate pulse gate pulse of AC wave
61	 The Average value of alternating curterms of: (1) charge transfer (2) heat generation 	rrent is representation of equivalent DC value in on (3) mass transfer (4) voltage generation
62.		stem as compared to a single phase system is: (3) equal (4) fluctuating
63.	In the blocked rotor test of a three-pharepresentative of: (1) All losses (3) Core losses	(2) Windage and friction losses (4) Copper losses
64.	The blocked rotor test of a three-phase (1) Heat run Test (3) Open Circuit Test	induction motor is equivalent to: (2) No load Test (4) Short Circuit Test
65.	laungs.	a three phase induction motor is provided for
66.		(3) up to 5 hp (4) Not at all whase induction motor to provide starting torque
	(1) increased current(3) increased voltage	(2) reduced current(4) None
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67.	For high starting torque in a squirrel oprovisions of:		induction motor the rotor is made with
	(1) Double cage		External resistance
	(3) External supply	(4)	All of these
68.	An induction motor will run at synchrone	ous s	speed:
	(1) At no load	(2)	At light load
	(3) At rated load	` '	Never
69.	An 6 pole three-phase induction motor rotting magnetic field and rotor slip, resp	is r	unning at 900 rpm. What is the speed of vely:
		(2)	1500 rpm, 10%
	(1) 3000 rpm, 10%		1000 rpm, 5%
	(3) 1000 rpm, 10%		
70.	a tapping of 30% is 80 Nm. If the tap	ctio ping	n motor by an auto-transformer starter with of auto-transformer starter is changed to
	60%, then the starting torque shall be:	(2)	240 Nm (4) 320 Nm
	(1) 40 Nm (2) 160 Nm	(3)	240 Nili (1) 320 133
71.	Which of the following is a desirable ch	aract	eristic of an instrument?
	(1) High drift	(2)	High measuring lag
	(3) High fidelity	(4)	Poor reproducibility
72.	Which of the following in the flue ga	ises	going out of the furnace is measured by
	Zirconia probe?	(2)	Carbon dioxide
	(1) Oxygen	, .	Temperature
	(3) Carbon monoxide	, ,	
73.	Working principle of mercury in glass the	herm	ometer is based on following:
	(1) Volumetric expansion	(2)	Pressure rise with temperature
	(3) Linear expansion	(4)	Temperature rise with pressure
74.	Gamma rays is used for the measurement	nt of	one of the following:
,,	(1) Pressure (2) Temperature	(3)	Flow (4) Liquid level
75.	Which of the following is not a differen	tial p	pressure flow meter ?
. ••	(1) Rota meter (2) Flow nuzzle	(3)	Venturi meter (4) Orifice meter
Ph.D	-EE-December, 2024/(Electrical Engg.)(SET	P. T. O.

76.	Which of the following is not a variable	area flow meter ?
	(1) Rota meter	(2) Piston type motor
	(3) Venturi meter	(4) Magnetic flow meter
77.		nciple of hall effect in its construction? (3) Galvanometer (4) Gauss meter
78.	In automatic generation control the volt	
	(1) Controlling the excitation	
	(2) Controlling the turbine action	
	(3) Excitation control for voltage and to	urbine speed control for frequency
	(4) Turbine speed control for voltage and	ad excitation control for frequency
	(4) Turbline speed control for voltage an	id Oxerons
79.	Unit up- time in unit commitment probl	em is:
	(1) A unit minimum operating time	
	(3) A unit total life time	(4) A unit minimum designing time
80.	ACSR conductor having seven steel stawill be specified as:	andard surrounded by 25 aluminium conductor
	(1) 7/25 (2) 7/32	(3) 25/7 (4) 25/32
81.	Actual tripping of a static relay is obtain	ed by:
	(1) IGBTs	(2) Thyristors
	(3) UJTs	(4) None of the above
82.	By increasing the transmission voltage can be dispatched keeping the line loss:	to double of its original value, the same power
	(1) Equal to original value	(2) Half the original value
	(3) Double the original value	(4) One-fourth of original value
83.	For the synchronous generator connecte how are the change of voltage (ΔV) and power (P) and the reactive power (Q)?	d to an infinite bus through a transmission line, I change of frequency (Δf) related to the active
	(1) ΔV is proportional to P and Δf to Q	(2) ΔV is proportional to Q and Δf to P
	(3) Both ΔV and Δf are proportional to P	(4) Both ΔV and Δf are proportional to Q
Ph.D-	EE-December, 2024/(Electrical Engg.)(S	

84.	A lossless coaxial transmission line has a length of 10 cm. Find the lowest resonant frequency if the line is air filled:			
	(1) 374.5 MHz	(2) 474 MHz	(3) 581 MHz	(4) 749 MHz
85.	Which one of the parameters?	following is valid f	or short transmissio	n lines in terms of ABCD
	(1) B = D = 0	(2) $C = 0$	(3) A = B = 1	(4) A = C = 1
86.	voltage and energy the capacitors are	stored of the series	combination are V : . The terminal volta	ed in serices. The terminal and Wse respectively. Next ge and energy stored of the o of Wse/Wpa is: (4) 2/9
87.	of real and imag quantities are amp complex pointing (1) $(E_x(t)H_y(t) - E_y(t))$	inary parts are $E =$ litudes. Which of the	$(E_a + jE_i)a_x$ and H following expressio (2) $(E_x(t)H_y(t) + E_y(t))$	
88.	Which material is	used for indoor bus b	oar ? War in the large	
	(1) Copper	(2) Aluminium		(4) Galvanized steel
89.	The load sharing between two steam driven alternators operating in parallel may be adjusted by varying the:			
		guic.		
	(1) Power factor	g the .	(2) Speed of the a	lternator
	(1) Power factor	to the prime mover	(2) Speed of the a(4) None of these	lternator
90.	(1) Power factor(3) Steam supply		(4) None of these	lternator
90.	(1) Power factor(3) Steam supply	to the prime mover	(4) None of these	
90.	(1) Power factor(3) Steam supplyOverspeed protect	to the prime mover	(4) None of these one by:	
90. 91.	 Power factor Steam supply Overspeed protect Differential re Alarm 	to the prime mover ion of generator is do	(4) None of theseone by :(2) Over current re(4) Governor	
	 Power factor Steam supply Overspeed protect Differential re Alarm The Newton Raph 	to the prime mover ion of generator is do lay son method is also ca	(4) None of theseone by :(2) Over current re(4) Governor	elay
	 Power factor Steam supply Overspeed protect Differential re Alarm 	to the prime mover ion of generator is do lay son method is also ca	(4) None of theseone by:(2) Over current re(4) Governoralled as:	elay
	 Power factor Steam supply Overspeed protect Differential re Alarm The Newton Raph Tangent method Chord method 	to the prime mover ion of generator is do lay son method is also ca od	 (4) None of these one by: (2) Over current results (4) Governor alled as: (2) Secant method (4) Diameter method 	elay
91.	 Power factor Steam supply Overspeed protect Differential re Alarm The Newton Raph Tangent method Chord method 	to the prime mover ion of generator is do lay son method is also ca	 (4) None of these one by: (2) Over current results (4) Governor alled as: (2) Secant method (4) Diameter method 	elay

93. Laplace transform of $f(t) = e^{at}$ is:

	(1) s/(s+a)	(2) $s/(s-a)$	(3) $1/(s+a)$	(4) $1/(s-a)$
94.	Laplace transform	of the unit step fun	ction u(t):	
	$(1) 1/s^3$	(2) $1/s^2$	(3) 1/s	(4) 1
95.	The Fourier series f	for $f\{x\} = \sin^2 x \operatorname{def}$	ined over range of -7	$\tau \le x \le \pi \text{ is } :$
	(1) $\{\frac{1}{2} - (\sin 2x)/2$	2}	(2) $\{\frac{1}{2} + (\sin 2x)\}$	x)/2}
	(3) $\{ \frac{1}{2} - (\cos 2x) / (\cos $		(4) $\{ \frac{1}{2} + (\cos 2 + \cos 2 +$	x)/2}
96. The Fourier series expansion of X^3 in the range of $-1 < X < 1$ continuation has:		-1 < X < 1 with periodic		
	(1) Only Cosine Te	erms	(2) Only Sine Te	rms
	(3) Both Sine and (Cosine Terms	(4) Can't be said	
97.	Find the wrong one	from the following	a statements :	
		Find the wrong one from the following statements: (1) If A is diagonalizable and invertible, then A ⁻¹ is diagonalizable.		
	(2) If A is diagonal		•	anzaoie.
	·			multiplicity 1, then A is
	(4) An n x n matrix	with fewer than n	distinct eigenvalues i	s not diagonalizable.
98.	If A and B are square	re matrices of the s	ame order, then tr(AI	3)=
			(3) $tr(A) + tr(B)$	
99.	A linear system is c	alled consistent if i	t has :	
	(1) At least one sol		(2) infinitely solution	tions
	(3) no solutions		(4) None of these	
100.	Following method i	s used for finding t	he minima or maxima	for a unimodal function:
	(1) Exhaustive sear	ch	(2) Interval halvin	g
	(3) Region eliminat	ion	(4) All of these	
		Long district		

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SET-X

10025

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1.	. The Newton Raphson method is also called as:				
	(1) Tangent method		(2) Secant method		
	(3) Chord method		(4) Diameter met	hod	
2.	For a given x-y plo	ot, the value of y/x in	terms of the angle	rms of the angle θ is given by:	
	(1) Sec θ	(2) Tan θ	(3) Cot θ	(4) Cosec θ	
3.	Laplace transform	of $f(t) = e^{at}$ is:			
		(2) $s/(s-a)$	(3) $1/(s+a)$	(4) $1/(s-a)$	
4.	Laplace transform	of the unit step funct	ion u(t) :		
	$(1) 1/s^3$	(2) $1/s^2$	(3) 1/s	(4) 1	
5.	The Fourier series f	for $f\{x\} = \sin^2 x$ defin	ed over range of $-\pi$	$\leq x \leq \pi$ is:	
	(1) $\{\frac{1}{2} - (\sin 2x)/2$		(2) $\{\frac{1}{2} + (\sin 2x)\}$		
	(3) $\{\frac{1}{2} - (\cos 2x)\}$	2 }	(4) $\{ \frac{1}{2} + (\cos 2x) \}$	$\{ \frac{1}{2} + (\cos 2x)/2 \}$	
6.	6. The Fourier series expansion of X^3 in the range of $-1 < X < 1$ with period continuation has:			-1 < X < 1 with periodic	
	(1) Only Cosine Te	erms	(2) Only Sine Ter	rms	
	(3) Both Sine and (Cosine Terms	(4) Can't be said		
7.	Find the wrong one from the following statements:				
	(1) If A is diagonal	izable and invertible	e, then A ⁻¹ is diagon	alizable.	
	(2) If A is diagonal	izable, then A ^T is di	agonalizable.		
	(3) If every eigen diagonalizable.		A has algebraic	multiplicity 1, then A is	
	(4) An n x n matrix with fewer than n distinct eigenvalues is not diagonalizable.		is not diagonalizable.		
8.	If A and B are square	re matrices of the sa	me order, then tr(A)	B) =	
	(1) tr (BA)	(2) $tr(A + B)$	(3) $tr(A) + tr(B)$	(4) tr (A) tr (B)	
9.	A linear system is c	alled consistent if it	has:		
	(1) At least one sol	ution	(2) infinitely solu	itions	
	(3) no solutions		(4) None of these	e ['] · · · · · · · · · · · · · · · · · · ·	
Ph.D-I	EE-December, 2024	/(Electrical Engg.)(SET-X)/(A)	P. T. O.	

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	10.	Following method is used for finding the (1) Exhaustive search (3) Region elimination	minima or maxima f (2) Interval halving (4) All of these	or a unimodal function:
	17.	If supply to one terminal of three phase fails, assuming magnetic circuit symmwill be:	ietry, voltage on sec	condary side at no load
		(1) 345, 115, 115 (2) 230, 115, 115	(3) 230, 230, 115	(4) 345, 0, 345
	12.	The windings of a Q kVA, V_1/V_2 v transformer are connected to operate voltage and power rating of new configuration.	as single-phase tran	isformer. The maximum
	4.0	(1) V_1/V_2 , 3Q (2) $\sqrt{3} V_1/V_2$, 2Q	(3) V_1/V_2 , Q/3	(4) $2 V_1/V_2$, $2Q/3$
	13.	An effectively grounded system has:		
		(1) $0 \le X_0/X_1 \le 3$, $R_0/X_1 > 1$ (3) $0 \le X_0/X_1 \le 3$, $0 \le R_0/X_1 \le 1$	(2) $0 \le R_0/X_1 \le 1, X_1$	
	4.4		$(4) \ \ 0 \le X_0 / X_1 \le 1, \ 0$	
	14.	A 50 Hz 220/400, 50 kVA, single-phase with secondary winding. Then:	transformer operate	s on 220 V, 40 Hz supply
		 The eddy current loss and hysteresis The eddy current loss and hysteresis Hysteresis loss of the transformer inc The eddy current loss decreases while 	loss of the transform	er decreases
	15.	Which of the following should be the according to Indian Standard specification	ons !	a relay in radial system
		$(1) \le 1.2 I_{\text{setting}} \qquad (2) \ge 1.3 I_{\text{setting}}$	$(3) \ge 1.5 I_{\text{setting}}$	$(4) \geq 1.73 I_{\text{setting}}$
	16.	A fuse wire of circular cross-section with What should be the radius of the wire to	h 0.8 mm radius blow	ws off at a current of 8 A. A?
		(1) 1.6 mm (2) 0.4 mm	(3) 0.2 mm	(4) 0.1 mm
	17.	In a biased differential relay the bias is d (1) Fault current and operating current (2) Operating coil current and restrainin		
		(3) Number of turns of restraining and o(4) Fault current and restraining coil cur	perating coil	
Ph	.D-E	EE-December, 2024/(Electrical Engg.)(S	SET-X)/(A)	

18.	Why is it difficult to interrupt a capacitive (1) Current magnitude is very small (2) The restriking voltage is very high (3) The current has a leading power fact (4) None of the above	
19.	A differential relay measures the vector of (1) Two currents (2) Two voltages (3) Two or more similar electrical quant (4) None of the above	
20.	In an impedance relay, fault current is m	aximum if fault occurs near the:
6	(1) Realy	(2) Center of the line
	(3) Transformer	(4) None of the above
21.	Actual tripping of a static relay is obtain	ed by :
	(1) IGBTs	(2) Thyristors
	(3) UJTs	(4) None of the above
22.	By increasing the transmission voltage can be dispatched keeping the line loss: (1) Equal to original value (3) Double the original value	to double of its original value, the same power (2) Half the original value (4) One-fourth of original value
23.	how are the change of voltage (ΔV) and power (P) and the reactive power (Q)? (1) ΔV is proportional to P and Δf to Q	d to an infinite bus through a transmission line, d change of frequency (Δf) related to the active (2) ΔV is proportional to Q and Δf to P (4) Both ΔV and Δf are proportional to Q
24.	frequency if the line is air filled:	s a length of 10 cm. Find the lowest resonant (3) 581 MHz (4) 749 MHz
25.	parameters ?	or short transmission lines in terms of ABCD
	(1) $B = D = 0$ (2) $C = 0$	(3) $A = B = 1$ (4) $A = C = 1$
Ph.D-	EE-December, 2024/(Electrical Engg.)(S	SET-X)/(A) P. T. O.

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26	voltage and energy stored of the service the capacitors are connected in paraparallel combination are V/2 and W ₁ (1) 16/9 (2) 8/9	llel. The terminal v	oltage and energy stored of a
27	of real and imaginary parts are E quantities are amplitudes. Which of complex pointing vector:	$= (E_a + jE_i)a_x$ and	$H = (H_a + iH_i)a_i$ where the
	(1) $(E_x(t)H_y(t) - E_y(t)H_x(t))a_z$	() () ()	•
	(3) $(E_x(t)H_x(t) - E_y(t)H_y(t))a_z$	$(4) (E_x(t)H_x(t) -$	$+ E_{y}(t)H_{y}(t))a_{z}$
28.	The second is used for midoor bu	s bar ?	
	(1) Copper (2) Aluminium	(3) Silver	(4) Galvanized steel
29.	The load sharing between two stear adjusted by varying the:	n driven alternators	operating in parallel may be
	(1) Power factor	(2) Speed of the	alternator
	(3) Steam supply to the prime mover	(4) None of the	se
30.	Overspeed protection of generator is	done by :	
	(1) Differential relay	(2) Over current	relay
	(3) Alarm	(4) Governor	
31.	An alternator is said to be over excited	d when it is operating	at:
	(1) Leading power factor		
	(3) Unity power factor	(4) None of thes	
32.	In a transformer hysteresis and eddy c	urrent losses denend	linon
	(1) Load current	(2) Supply frequ	
	(3) Maximum flux density	(4) (2) and (3) be	•
33.	Role of power system stabilizer in exc (1) Provide de power to the synchrono (2) Processes and amplifies input curr (3) Provide an additional input signal	itation system is to : ous machine field wi ent signal	nding
	- 0	-	i January and a second second

(4) Provide an additional input signal to regulator to boost system frequency

34.	Resistance switching is normally employed in:		
	(1) Bulk oil breakers	(2) Minimum oil breakers	
	(3) SF6 circuit breakers	(4) Air blast circuit breakers	
35.	The arc voltage in a circuit breaker is:		
	(1) In the phase with arc current	(2) Lagging the arc current by 90°	
	(3) Leading the arc current by 90°	(4) Lagging the arc current by 45°	
36.	A negative sequence relay is commonly	used to protect:	
	(1) Transformers	(2) Transmission lines	
	(3) Alternators	(4) Bus bar	
37.	If the fault current is 3000 arms, the rel	or parting 50% and the O.T. at the 100% of	
	the plug setting multiplier will be:	ay setting 50% and the C.T. ratio is 400/5, then	
	(1) 25 amps (2) 15 amps	(3) 50 amps (4) 30 amps	
38.	In a HRC fuse the time between the cut of	off and the final gurrent zero is called 2	
	(1) Pre- arcing time	(2) Arcing time	
	(3) Total operating time	(4) Dead time	
39.	Rimetallic thermometer massures to		
00.	Bimetallic thermometer measures tempe (1) 0 to 400°C (2) -40 to 1000 °C	(3) 700 to 1500 °C (4) 45 to 500°C	
40.	Thermistor is a transducer. Its temperatu	(4)	
	(1) Negative (2) Positive	(3) Zero (4) Infinite	
41.	Which of the following is a desirable cha	aracteristic of an instrument?	
	(1) High drift	(2) High measuring lag	
	(3) High fidelity	(4) Poor reproducibility	
42.	Which of the following in the flue ga	ises going out of the furnace is measured by	
	Zirconia probe?		
	(1) Oxygen	(2) Carbon dioxide	
	(3) Carbon monoxide	(4) Temperature	
43.	Working principle of mercury in glass th	nermometer is based on following:	
	(1) Volumetric expansion	(2) Pressure rise with temperature	
	(3) Linear expansion	(4) Temperature rise with pressure	
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• п•П•]	EE-December, 2024/(Electrical Engg.)(S	SET-X)/(A) P. T. O.	

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44.	Gamma rays is used for the measureme	ent of one of the following .
	(1) Pressure (2) Temperature	(3) Flow (4) Liquid level
45.	Which of the following is not a differen	ntial pressure flow meter?
	(1) Rota meter (2) Flow nuzzle	(3) Venturi meter (4) Orifice meter
46.	Which of the following is not a variable	
	(1) Rota meter	(2) Piston type meter
	(3) Venturi meter	(4) Magnetic flow meter
47.	Which one of the following uses the pr	inciple of hall effect in its construction?
	(1) Ammeter (2) Voltmeter	(3) Galvanometer (4) Gauss meter
Lagra.	Solution Solution Solution	
48.	Southfull Country and Act	tage and frequency is controlled by:
	(1) Controlling the excitation	
	(2) Controlling the turbine action	
	(3) Excitation control for voltage and t	_ •
	(4) Turbine speed control for voltage a	nd excitation control for frequency
49.	Unit up- time in unit commitment prob	lem is :
	(1) A unit minimum operating time	(2) A unit minimum repair time
	(3) A unit total life time	(4) A unit minimum designing time
50.	ACSR conductor having seven steel s	tandard surrounded by 25 aluminium conductor
	will be specified as:	and a surrounded by 23 aluminium conductor
	(1) 7/25 (2) 7/32	(3) 25/7 (4) 25/32
-2	To To die and the area of the second of the	(1) 25.52
51.	in India, which organisation performs t	he role of Independent System Operator:
	(1) CEA (2) PGCIL	(3) CERC (4) POSOCO
52.	Snubber circuit is used to limit the:	
	(1) Rise of current	(2) Rise of voltage across device
	(3) Conduction period	(4) Commutation period
53.	The dimension of outer conduct	7
55.	of inner and outer current densities is:	and c and that of inner conductor is a, the ratio
	1 2 . 1	(2)
DL D	•	(3) $(c-b)/a$ (4) $(cb)/a^2$
Pn.D	EE-December, 2024/(Electrical Engg.)	(SET-X)/(A)

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54.	The following statement is correct for uniform plane waves:
	(1) The wavelength λ is longer and velocity v is higher in all real media than they are in free space
	(2) The wavelength λ is longer and velocity v is lower in all real media than they are in free space
	(3) The wavelength λ is shorter and velocity v is higher in all real media than they are in free space
	(4) The wavelength λ is shorter and velocity v is lower in all real media than they are in free space
55.	A lossless dielectric slab has $\varepsilon_R = 9$. Its intrinsic impedance is : (1) $360 \pi\Omega$ (2) $120 \pi\Omega$ (3) $40 \pi\Omega$ (4) $30 \pi\Omega$
56.	If $D = 10 y^2 a_x + 10 x^2 y a_y + 15 a_z$, the total charge enclosed within the region $0 < x, y, z < 1 \text{m is}$:
	(1) 40/3 C (2) 20/3 C (3) 10/3 C (4) 5/3 C
57.	A perfect dielectric medium has a uniform plane wave. Which of the following statements for the wave are correct?
	(1) The electric and magnetic fields are in the same direction

(2) The electric and magnetic fields are perpendicular to each other

(3) The electric and magnetic fields are opposite to each other

(4) The electric and magnetic fields do not occur in the medium

The magnetic flux density in the air gap between two iron surfaces is Bg. The force **58.** between the iron surfaces at this flux density is F. If the flux density is reduced to (3/4) $\boldsymbol{B}_{\text{g}}$, the decrease in the force would be :

(1) (3/4) F

(2) (7/16) F

(3) (1/4) F

(4) None of the above

59. In a full-wave controlled rectifier (center tap transformer connection), if ac supply is 230 V, 50 Hz, the PIV required for SCRs shall be:

(1) 230 V

(2) 325 V

(3) 460 V

(4) 650 V

60. In a half-wave rectifier with a shunt capacitance filter, what is the frequency of ac ripple at output, if the frequency of ac supply is 50 Hz.

(1) 25 Hz

(2) 50 Hz

(3) 100 Hz

(4) Zero Hz

61.	A single diode oper (1) Capacitor (3) Full Wave Rec		(2) Bridge Rectifie(4) Half Wave Rec	r etifier
62.	The ratio of latchin (1) Less than 1	g current / holding cu (2) More than 1	errent in a 20 thyristo (3) Equal to 1	or shall be: (4) Any of these
63.	If an AC voltage value of:	vave is corrupted wiveform differs from	th an arbitrary numlits fundamental freq	ber of harmonics, then the uency component in terms
	(1) Only the peak v(3) Only the Avera		(2) Only the RMS(4) All of these	values
64.	the anode current sl	hall be:		ate current is doubled, then
	(1) Zero	(2) Doubled	(3) Halved	(4) Same
65.		resultant current in a		a dc current of 10 A and a
	(1) 14.1 A	(2) 17.3 A	(3) 22.4 A	(4) 30 A
66.	The thyristor circuito another frequence	•	rts polyphase AC vo	oltages from one frequency
	(1) Cycloconverter	Correction of the Control of the Con	(2) Inverter	
	(3) Converter	an company of the safe	(4) Chopper	
67.	If a single diode, fe for:	d from an AC source	e, is supplying to a pu	are inductor, it will conduc
	(1) 90°	(2) 180°	(3) 270°	(4) 360°
68.	A single-phase dio ripple free current t	de bridge rectifier so the load. The AC s	supplying a highly i	nductive load with almos
	(1) sinusoidal	(2) constant DC	(3) triangular	(4) square
69.	Snubber circuit is u	sed to limit the Rate	of:	
	(1) Conduction per	riod	(2) Commutation 1	Period
	(3) Rise of voltage		(4) Rise of Curren	
	(-)		(1) Table of Cuffen	ι

70	2. An SCR is considered to be a semi-controlled device because:				
	(1) It can be turned OFF but not ON by gate pulse(2) It can be turned ON but not OFF gate pulse				
	(3) It conducts	during only half cycle	of AC wave		
	(4) It can be tu	rned ON during only h	alf cycle of AC w	ave	
71.	In a commutation	on circuit, satisfactory	turn off of an SCR	e is obtained when	
	(1) Circuit turn	off time < Device tur	n-off time	t is obtained when,	
		e constant < Device tur			
		-off time > Device tur			
		constant > Device tu			
72.	Which of the fo	llowing is not a currer	nt triggered device	?	
	(1) Thyristor	(2) GTO	(3) Triac	(4) MOSFET	
73.	A switched mo switching eleme	de power supply oper	rating at 20 kHz t	o 100 kHz range uses as mai	n
	(1) Thyristor		(2) T. :	(4) TITE	
	(1) Thyristor	(2) MOSFET	(3) Triac	(4) UJT	
74.	The Triac can be	e used as :			
	(1) AC voltage	regulator	(2) Inverter		
	(3) Rectifier		(4) Multi-quad	drant Chopper	
75.	Which of the fol	lowing does not cause	e permanent dama	ge to the SCR ?	
	(1) High rate of	rise of current	(2) High curre	ent	
	(3) High rate of	rise of voltage	(4) High temp	erature rise	
76.	Which of the fo	llowing Flip-flop circ	enits holds or tog	gles its output according to the	16
	input state?			sion in output according to a	
	(1) T	(2) D	(3) JK	(4) SR	
		marine branking (
77.	Two's compleme	ent of 0111 is:			
	(1) 1000	(2) 1100	(3) 1001	(4) 1010	
78.	Toggeling all the	values of any binary	number gives its:		
	(1) Two's compl	ement	(2) One's com	plement	
	(3) Bit shifted m	umber	(4) None of th	e above	
Ph.D-E	E-December, 20	24/(Electrical Engg.))(SET-X)/(A)	P. T.	0.

10		.1	load of any circuit, the power drawn as
	compared to previous case since	(3)	as load of any circuit, the power drawn as (4) can't be said
80	The RMS value of alternating current is	s rep	presentation of equivalent DC value in terms
	(1) charge transfer (2) heat generation	n (3)	3) mass transfer (4) voltage generation
81.	The Average value of alternating curre terms of:	ent is	is representation of equivalent DC value in
	(1) charge transfer (2) heat generation	n (3)	3) mass transfer (4) voltage generation
82.	The power density of a three phase syst	em a	as compared to a single phase system is:
	(1) higher (2) lower		equal (4) fluctuating,
83.	In the blocked rotor test of a three-phase representative of:	se in	nduction motor, the obtained parameters are
	(1) All losses	(2)) Windage and friction losses
	(3) Core losses	(4)) Copper losses
84.	The blocked rotor test of a three-phase i	nduc	ction motor is equivalent to:
	(1) Heat run lest	(2)) No load Test
0.5	(3) Open Circuit Test	(4)) Short Circuit Test
85.	The direct on line (DOL) starting in a ratings:	a thr	ree phase induction motor is provided for
	(1) above 5 hp (2) above 10 hp	(3)) up to 5 hp
86.	The star-delta starter is used in a three p	hase	e induction motor to provide starting torque
	(1) increased current		e induction motor to provide starting torque
	(3) increased voltage	(2)	reduced current
87.	_		
	provisions of:	cage	None e induction motor the rotor is made with
	(1) Double cage	,	motor the rotor is made with
	(3) External supply	(2)	External region
Ph.D-E	E-December, 2024/(Electrical France)	(4)	All of these

88.	and the first at synchron	nous speed:
	(1) At no load (2) At light load	(3) At rated load (4) Never
89.	roung magnetic field and rotor slip, res	r is running at 900 rpm. What is the speed of spectively: 6 (3) 1000 rpm, 10% (4) 1000 rpm, 5%
90.	The developed starting torque of an ind a tapping of 30% is 80 Nm. If the tage 60%, then the starting torque shall be:	uction motor by an auto-transformer starter with oping of auto-transformer starter is changed to
	(1) 40 Nm (2) 160 Nm	(3) 240 Nm (4) 320 Nm
91.	A wound rotor induction motor is pref the major consideration involved is:	Perred over squirrel cage induction motor when
	(1) High Starting Torque	(2) Low Starting Torque
	(3) Limited range speed control	(4) All of these
92.	The shunt resistance component in the induction motor, is representative of:	equivalent circuit obtained by no-load test of an
	(1) all losses	(2) Windage and friction losses
		(4) Copper losses
93.	a. The rotor of squirrel cage induction on it.	n motor has short circuited distributed windings
	b. The stator of squirrel cage induction	n motor has concentrated windings on it.
		(2) Statement b is true
	(3) Both are true	(4) None is true
94.	linearly	phase induction motor is zero and increases
	b. The starting torque of a three p	hase induction motor can be increased with
	additional rotor resistance.	(2) Statement b is true
	(1) Statement a is true	(4) None is true
	(3) Both are true	(4) 140He 15 Hac
Ph.D-F	EE-December, 2024/(Electrical Engg.)(SET-X)/(A) P. T. O.

95.	a.	The DOL starter is used only for wound rotor type of three phase induction motor.		
	b.	The DOL starter uses only "ON & O	FF"	switches and does not have any control of
		starting current.		
	(1)	Statement a is true		Statement b is true
	(3)	Both are true	(4)	None is true
96.	a.	The three phase induction motor is characteristic zone.	alw	rays operated in the negative Torque-slip
	b.	The negative Torque-slip characteristic zone is beyond maximum torque point towards zero slip.		
	(1)	Statement a is true	(2)	Statement b is true
	(3)	Both are true	(4)	None is true
97.	a.	The slip is the difference of synchro induction motor.	nous	speed and actual speed of the three phase
	b.	The slip is always proportional to tor	rque	of the three phase induction motor.
	(1)	Statement a is true	(2)	Statement b is true
	(3)	Both are true	(4)	None is true
98.	a.	The rotor of a three phase induction motor generates rotating magnetic field at 3000 rpm.		
	b.	The stator of a three phase, induction	n mo	otor controls the slip of the rotor.
		Statement a is true		Statement b is true
	(3)	Both are true	(4)	None is true
99.	a.	The efficiency of a three phase indu	ction	motor shall be less if the air gap is large.
	b.	The large air gap shall lead to poor r	owe	er factor in a three phase induction motor.
	(1)	Statement a is true	(2)	Statement h is true
		Both are true		None is true
100.	a.	supply.		notor is dependent of frequency of voltage
	b.	The actual speed of the induction m motor.	otor	is dependent on the number of poles of the
	(1)	Statement a is true	(2)	Statement b is true
	(3)	Both are true		None is true

SET-X

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Ph.D-EE-December, 2024

Electrical Engineering

10023

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Father's Name	Mother's Name	
Date of Examination		
(Signature of the Candidate)		(Signature of the Invigilator)

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(4) Poor reproducibility
(4) Poor reproducts
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(2) Carbon dioxide
(4) Temperature
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• •
eel standard surrounded by 25 aluminium conductor
(3) 25/7 (4) 25/32
ngg.)(SET-X)/(C) P. T. O.

44	Actual tripping of a static relay is ob	btained by:
((1) IGBTs	(4) None of the above
	De increasing the transmission volta	age to double of its original value, the same power
	(1) Equal to original value(3) Double the original value	(2) Half the original value(4) One-fourth of original value
13.	how are the change of voltage (ΔV)	ected to an infinite bus through a transmission line, and change of frequency (Δf) related to the active Δf ?
	power (P) and the reactive power (Q) (1) ΔV is proportional to P and Δf to (3) Both ΔV and Δf are proportional to	$O(Q)$ Q (2) ΔV is proportional to Q and Δf to P $O(Q)$ Q (4) Both ΔV and Δf are proportional to Q
14.	A lossless coaxial transmission line	e has a length of 10 cm. Find the lowest resonant
	frequency if the line is air filled: (1) 374.5 MHz (2) 474 MHz	
15.	Which one of the following is valid parameters?	d for short transmission lines in terms of ABCD
	(1) $B = D = 0$ (2) $C = 0$	(3) $A = B = 1$ (4) $A = C = 1$
16.	voltage and energy stored of the serie the capacitors are connected in paralle	C and 2C are connected in serices. The terminal ies combination are V and Wse respectively. Next lel. The terminal voltage and energy stored of the a respectively. The ratio of Wse/Wpa is: (3) 4/9 (4) 2/9
17.	of real and imaginary parts are $E =$	eld intensities in an electromagnetic field in terms $= (E_a + jE_i)a_x$ and $H = (H_a + jH_i)a_y$ where the he following expressions gives the real part of the
	(1) $(E_x(t)H_y(t) - E_y(t)H_x(t))a_2$	-
	(3) $(E_x(t)H_x(t) - E_y(t)H_y(t))a_z$	(4) $(E_x(t)H_x(t) + E_y(t)H_y(t))a_z$
18.	Which material is used for indoor bus b	bar?
	(1) Copper (2) Aluminium	(3) Silver (4) Galvanized steel
Ph.D-E	EE-December, 2024/(Electrical Engg.))(SET-X)/(C)

A The head charing between the superior the	two aleant driver	alternators ope	rating in parallel ma	ly he
(4) Queen which to the little (4) Amer giour		Apent of the alle None of these	i Malor	
A Cresqueed protection of go (1) Differential relay: (3) Alarm	(3)	: Over eurrent rel Ouvernor	пу	
the Newton Raphson method (1) Tangent method (3) Chord method	. (2)	ië i Secont method Diameter metho	nd	
22 Per a given x-y plon, the p (1) Sec 0 (2) T		is of the angle 0 Cot 0	is given by : (4) Cosec 0	
23. Laplace transform of f(t) = (1) s'(s + a) (2) s) 1/(8±a)	(4) 1/ (n = n)	
24. Laplace transform of the (1) 1/s ⁵ (2)	3	(() }) = 1/a	(4) 1	
 25. The Fourier series for f(x (1) { × - (Sin 2x)/2} (3) { × - (Cos 2x)/2} 	(9	over range of =π s c) { ½ + (8in 2x)/ i) { ½ + (Cos 2x)	(A)	
26. The Fourier series expectation has: (1) Only Cosine Terms (3) Both Sine and Cosin		the range of = (2) Only Sine Ter 4) Can't be said		riodic
 27. Find the wrong one from (1) If A is diagonalizable (2) If A is diagonalizable (3) If every eigenvaludiagonalizable (4) An n x n matrix with 	le and invertible, the diagone of a matrix A	nen A ⁻¹ is diagon onalizable. A has algebraic	multiplicity 1, then	A is
Ph.D-EE-December, 2024/(E)	ectrical Engg.)(S	ET-X)/(C)		P. T. O.

4		
28	8. If A and B are square matrices of the (1) tr (BA) (2) tr (A + B)	same order, then $tr(AB) =$ (3) $tr(A) + tr(B)$ (4) $tr(A) tr(B)$
	 A linear system is called consistent if (1) At least one solution (3) no solutions 	it has: (2) infinitely solutions (4) None of these
30	 Following method is used for finding t (1) Exhaustive search (3) Region elimination 	he minima or maxima for a unimodal function (2) Interval halving (4) All of these
31	 A wound rotor induction motor is pretthe major consideration involved is: (1) High Starting Torque (3) Limited range speed control 	ferred over squirrel cage induction motor whe (2) Low Starting Torque (4) All of these
32.	The shunt resistance component in the einduction motor, is representative of: (1) all losses (3) Core losses	equivalent circuit obtained by no-load test of an (2) Windage and friction losses (4) Copper losses
	b. The stator of squirrel cage induction (1)Statement a is true	motor has short circuited distributed windings motor has concentrated windings on it. (2) Statement b is true
	(3) Both are truea. The starting torque of the three philinearly.	(4) None is true nase induction motor is zero and increases
	o. The starting torque of a three phasadditional rotor resistance.(1) Statement a is true	se induction motor can be increased with
35. a	a. The DOL starter is used and a	2) Statement b is true 4) None is true d rotor type of three phase induction motor. "switches and does not be
() (3	1) Statement a is true 3) Both are true (2)	Statement h is tra-
	-December, 2024/(Electrical Engg.)(SET	None is true

30

	in the negative Torque-slip
36. a. The three phase induction motor is always operated	In the negative
36. a. The time phase meets	and maximum torque point
characteristic zone. b. The negative Torque-slip characteristic zone is beyone.	ond maximum see i
(2) Statement a is true	; iluc
(2) Roth are true	
37. a. The slip is the difference of synchronous speed and ac	tual speed of the three phase
37. a. The slip is the difference of synchronous speed and speed a	•
induction motor.b. The slip is always proportional to torque of the three plane.	nase induction motor.
b. The slip is always proportional to to 42.	s true
(1) Statement a is true	
(3) Both are true	was magnetic field at
38. a. The rotor of a three phase induction motor generate	es rotating magnetic field as
2000	
b. The stator of a three phase, induction motor controls t	ine stip of the rotors
(1) Statement a is true (2) Statement of	is true
(3) Both are true (4) None is true	
39. a. The efficiency of a three phase induction motor shall be	be less if the air gap is large.
- a shall load to poor nower factor in a u	hree phase induction motor.
b. The large air gap shall lead to pool power lactor (1) Statement a is true (2) Statement b	is true
(3) Both are true (4) None is true	
(3) Both are true	ndent of frequency of voltage
40. a. The synchronous speed of an induction motor is depe	ildelit of frequency of voltage
b. The actual speed of the induction motor is dependent	on the number of poles of the
b. The actual speed of the induction motor is depondent motor.	The state of the
(1) Statement a is true (2) Statement b	is true
(3) Both are true (4) None is true	78
(3) Both are true	
41. A single diode operates as a:	and the second s
(1) Capacitor (2) Bridge Reco	
(3) Full Wave Rectifier (4) Half Wave	Recuiler
42. The ratio of latching current / holding current in a 20 thys	ristor shall be:
(1) Less than 1 (2) More than 1 (3) Equal to 1	
Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(C)	P. T. O.

43.	If an AC voltage wave is corrupt overall voltage waveform differs of:	oted with an arbitrary nu from its fundamental fro	mber of harmonics, then the equency component in term
	(1) Only the peak values(3) Only the Average values	(2) Only the RM(4) All of these	of the second
44.	The anode current through a cond	lucting SCR is 10A. If its	gate current is doubled, the
	the anode current shall be: (1) Zero (2) Doubled	(3) Halved	(4) Same
45.	The RMS value of resultant curre sinusoidal alternating current of pe	ent in a wire which carries eak value 20 A, is:	s a dc current of 10 A and a
	(1) 14.1 A (2) 17.3 A	(3) 22.4 A	(4) 30 A
46.	The thyristor circuit that directly to another frequency is known as: (1) Cycloconverter (3) Converter	converts polyphase AC v (2) Inverter (4) Chopper	oltages from one frequency
47.	If a single diode, fed from an AC s for:	source, is supplying to a pu	are inductor, it will conduct (4) 360°
48.	A single-phase diode bridge recti ripple free current to the load. The	AC side current waveform	shall be:
	(1) sinusoidal (2) constant I	OC (3) triangular	(4) square
49.	Snubber circuit is used to limit the (1) Conduction period (3) Rise of voltage across device	Rate of: (2) Commutation P (4) Rise of Current	eriod
50 .	An SCR is considered to be a semi- (1) It can be turned OFF but not OF (2) It can be turned ON but not OF (3) It conducts during only half cyc (4) It can be turned ON during only	N by gate pulse F gate pulse cle of AC wave	
51/.	An alternator is said to be over excitant (1) Leading power factor (3) Unity power factor	ted when it is operating at a (2) Lagging power for (4) None of these	

52.	In a transformer hysteresis and eddy current losses depend upon:
) <u>.</u>	(1) Load current (2) Supply frequency
	(3) Maximum flux density (4) (2) and (3) both
53.	Role of power system stabilizer in excitation system is to:
J J.	(1) Provide de power to the synchronous machine field winding
	(2) Processes and amplifies input current signal
	(3) Provide an additional input signal to regulator to damp power system oscillation
	(4) Provide an additional input signal to regulator to boost system frequency
54.	Resistance switching is normally employed in:
J-1.	(1) Bulk oil breakers (2) Minimum oil breakers
	(3) SF6 circuit breakers (4) Air blast circuit breakers
	The are voltage in a circuit breeker is:
55.	The arc voltage in a circuit breaker is: (1) In the phase with arc current (2) Lagging the arc current by 90°
	(3) Leading the arc current by 90° (4) Lagging the arc current by 45°
56	
	(1) Transformers (2) Transmission lines
	(3) Alternators (4) Bus bar
57	1. If the fault current is 3000 amps, the relay setting 50% and the C.T. ratio is 400/5, then
	the plug setting multiplier will be:
	(1) 25 amps (2) 15 amps
	(3) 50 amps (4) 30 amps
5	8. In a HRC fuse the time between the cut off and the final current zero is called?
	(1) Pre- arcing time (2) Arcing time
	(3) Total operating time (4) Dead time
	59. Bimetallic thermometer measures temperature in the following range:
	(1) 0 to 400°C (2) -40 to 1000 °C (3) 700 to 1500 °C (4) 45 to 500°C
	60. Thermistor is a transducer. Its temperature coefficient is:
	(1) Negative (2) Positive (3) Zero (4) Infinite
PI	n.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(C)

61,	In a commutation circuit, satisfactory turn off of an SCR is obtained when: (1) Circuit turn-off time < Device turn-off time (2) Circuit time constant < Device turn-off time (3) Circuit turn-off time > Device turn-off time (4) Circuit time constant > Device turn-off time					
62.	Which of the follow (1) Thyristor	ving is not a current (2) GTO	nt triggered device? (3) Triac	(4) MOSFET		
63.	A switched mode p switching element: (1) Thyristor		rating at 20 kHz to	100 kHz range uses as mai (4) UJT		
64.	The Triac can be use (1) AC voltage regulation (3) Rectifier		(2) Inverter (4) Multi-quadra	ant Chopper		
65.	Which of the follow (1) High rate of rise (3) High rate of rise	e of current	permanent damage (2) High current (4) High tempera			
66.	Which of the following Flip-flop circuits holds or toggles its output according to the input state? (1) T (2) D (3) JK (4) SR					
67.	Two's complement of (1) 1000	of 0111 is: (2) 1100	(3) 1001	(4) 1010		
68.	Toggeling all the values of any binary n (1) Two's complement (3) Bit shifted number		number gives its: (2) One's complement (4) None of the above			
69.	If the inductance L is removed from the load of any circuit, the power drawn as compared to previous case shall be:					
70./	The RMS value of a of :			(4) can't be said uivalent DC value in terms		
, D E	(1) charge transfer E-December, 2024/6			(4) voltage generation		

	Average value of alternating current	t is	representation of equivalent DC value in		
71./	terms of: (1) charge transfer (2) heat generation	(3)	mass transfer (4) voltage generation		
72.	The power density of a three phase system (1) higher (2) lower	n as (3)	s compared to a single phase system is a equal (4) fluctuating		
	and blocked rotor test of a three-phase	ind	duction motor, the obtained parameters are		
73.	representative of:				
	(1) All losses		Windage and friction losses		
	(3) Core losses	(4)	Copper losses		
	The blocked rotor test of a three-phase induction motor is equivalent to:				
74.	(1) Heat run Test) No load Test		
	(3) Open Circuit Test	(4)) Short Circuit Test		
	The direct on line (DOL) starting in a three phase induction motor is provided				
75.		thr	ree phase induction motor is pro-		
	ratings: (1) above 5 hp (2) above 10 hp	(3)) up to 5 hp (4) Not at all		
76.	76. The star-delta starter is used in a three phase induction motor to provide starting at:				
	(1) increased current	(2)	2) reduced current		
	(3) increased voltage	(4)	None		
77		cag	ge induction motor the rotor is made with		
	· · · · · · · · · · · · · · · · · · ·	(2	2) External resistance		
		(4	4) All of these		
78	8. An induction motor will run at synchron				
	(1) At no load (2) At light load	(3	3) At rated load (4) Never		
7	 An 6 pole three-phase induction motor rotting magnetic field and rotor slip, res 	s running at 900 rpm. What is the speed of ctively:			
			3) 1000 rpm, 10% (4) 1000 rpm, 5%		
Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(C) P. T. O.					

80/	The developed starting torque of an induate a tapping of 30% is 80 Nm. If the tapping of 30% is torque shall be	ction motor by an au ping of auto-transfo	ito-tr	ansformer starter is	starter with changed to
•	60%, then the starting torque shall be:	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		320 Nm	

(1) 40 Nm

(2) 160 Nm

(3) 240 Nm

(4) 320 Nm

81. If supply to one terminal of three phase core type transformer connected in star-delta fails, assuming magnetic circuit symmetry, voltage on secondary side at no load (1) 345, 115, 115 (2) 230, 115, 115 (3) 230, 230, 115 (4) 345, 0, 345

82. The windings of a Q kVA, V_1/V_2 volts, three phase delta connected core type transformer are connected to operate as single-phase transformer. The maximum voltage and power rating of new configuration shall be:

(1) V_1/V_2 , 3Q

(2) $\sqrt{3}$ V₁/V₂, 2Q (3) V₁/V₂, Q/3

 $(4) 2 V_1/V_2, 2Q/3$

83. An effectively grounded system has:

(1) $0 \le X_0/X_1 \le 3$, $R_0/X_1 > 1$

(2) $0 \le R_0/X_1 \le 1, X_0/X_1 > 3$

(3) $0 \le X_0/X_1 \le 3$, $0 \le R_0/X_1 \le 1$

(4) $0 \le X_0/X_1 \le 1$, $0 \le R_0/X_1 \le 3$

84. A 50 Hz 220/400, 50 kVA, single-phase transformer operates on 220 V, 40 Hz supply with secondary winding. Then:

(1) The eddy current loss and hysteresis loss of the transformer increases

(2) The eddy current loss and hysteresis loss of the transformer decreases

(3) Hysteresis loss of the transformer increases while eddy current loss remains same

(4) The eddy current loss decreases while hysteresis loss remains same.

Which of the following should be the operating value for a relay in radial system according to Indian Standard specifications?

 $(1) \leq 1.2 I_{\text{setting}}$

(2) $\geq 1.3 I_{\text{setting}}$ (3) $\geq 1.5 I_{\text{setting}}$

 $(4) \geq 1.73 I_{\text{setting}}$

86. A fuse wire of circular cross-section with 0.8 mm radius blows off at a current of 8 A. What should be the radius of the wire to blow at a current of 1 A?

(1) 1.6 mm

(2) 0.4 mm

(3) 0.2 mm

(4) 0.1 mm

87. In a biased differential relay the bias is defined as the ratio of:

(1) Fault current and operating current

(2) Operating coil current and restraining coil current

(3) Number of turns of restraining and operating coil

(4) Fault current and restraining coil current

Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(C)

88.	Why is it difficult to interrupt a capacitive circuit?	
	(1) Current magnitude is very small	
	(2) The restriking voltage is very high	
	(3) The current has a leading power factor	
	(4) None of the above	
89.	A differential relay managed to the difference by	
	A differential relay measures the vector difference between: (1) Two currents	
	(2) Two voltages	
	(3) Two or more similar electrical quantities(4) None of the above	
	(1) Trong of the above	
90.	really, reall cultere is maximum in real occurs lical tile.	
	(1) Realy (2) Center of the line	
	(3) Transformer (4) None of the above	
91.	In India which organization of the last tenth of	
	In India, which organisation performs the role of Independent System Operator: (1) CEA (2) PGCII. (3) CERC (4) POSOCO	
	(1) CEA (2) PGCIL (3) CERC (4) POSOCO	
92.	Snubber circuit is used to limit the:	
	(1) Rise of current (2) Rise of voltage across device	
	(3) Conduction period (4) Commutation period	
93.	and that of finite conductor is a, in	e ratio
	of inner and outer current densities is: $(1) (-2^2 + 2^2) (-2^2 + 2^2) = (2) (-2^2 + 2^$	
	(1) $(c^2 - b^2)/a^2$ (2) $a^2/(c^2 - b^2)$ (3) $(c-b)/a$ (4) $(cb)/a^2$	
94.	The following statement is correct for uniform plane waves:	
	(1) The wavelength λ is longer and velocity v is higher in all real media than the	iev are
	in free space	ioj iai
	(2) The wavelength λ is longer and velocity v is lower in all real media than they	are ir
	free space	
	(3) The wavelength λ is shorter and velocity v is higher in all real media than th	ey are
	in free space	•
	(4) The wavelength λ is shorter and velocity v is lower in all real media than th	ey are
	in free space	

Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(C)

P. T. O.

(4) $30 \pi\Omega$

(1) $360 \pi\Omega$

				1 1 swithin the
96.	If $D = 10 y^2 a_x +$	$10 x^2 y a_y + 15 a_z$, the total charge e	nclosed within the region
	0 < x, y, z < 1 m is: (1) 40/3 C	(2) 20/3 C	(3) 10/3 C	(4) 5/3 C
97.	(1) The electric and (2) The electric and (3) The electric and (4) The electric and (5)	rave are correct? I magnetic fields are I magnetic fields are I magnetic fields are I magnetic fields do	in the same direction perpendicular to each opposite to each other not occur in the medical control of the medical control occur.	er ium
98.	between the iron su	density in the air g rfaces at this flux de the force would be :	ap between two iron ensity is F. If the flux	surfaces is B _g . The force density is reduced to (3/4)
	(1) (3/4) F	(2) (7/16) F	(3) (1/4) F	(4) None of the above
99.	In a full-wave con 230 V, 50 Hz, the I	trolled rectifier (cen PIV required for SCF	ter tap transformer c Rs shall be:	onnection), if ac supply is
	(1) 230 V	(2) 325 V	(3) 460 V	(4) 650 V
100.		ctifier with a shunt the frequency of ac s		hat is the frequency of ac
	(1) 25 Hz	(2) 50 Hz	(3) 100 Hz	(4) Zero Hz

(3) $40 \pi\Omega$

(2) $120 \pi\Omega$

Total No. of Printed Pages: 13

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Ph.D-EE-December, 2024 Electrical Engineering

SET-X

10024

		Sr. No
Time : 11/4 Hours	Max. Marks : 100	Total Questions : 100
Roll No. (in figures)	(in words)	
Name	Date of Birth	
Father's Name	Mother's Name	
Date of Examination		
(Signature of the Candidate)		(Signature of the Invigilator)

CANDIDATES MUST READ THE FOLLOWING INFORMATION/INSTRUCTIONS BEFORE STARTING THE QUESTION PAPER.

- 1. All questions are compulsory.
- 2. The candidates must return the question booklet as well as OMR Answer-Sheet to the Invigilator concerned before leaving the Examination Hall, failing which a case of use of unfairmeans / mis-behaviour will be registered against him / her, in addition to lodging of an FIR with the police. Further the answer-sheet of such a candidate will not be evaluated.
- 3. Keeping in view the transparency of the examination system, carbonless OMR Sheet is provided to the candidate so that a copy of OMR Sheet may be kept by the candidate.
- 4. Question Booklet along with answer key of all the A, B, C & D code shall be got uploaded on the University Website immediately after the conduct of Entrance Examination. Candidates may raise valid objection/complaint if any, with regard to discrepancy in the question booklet/answer key within 24 hours of uploading the same on the University Website. The complaint be sent by the students to the Controller of Examinations by hand or through email. Thereafter, no complaint in any case, will be considered.
- The candidate must not do any rough work or writing in the OMR Answer-Sheet. Rough work, if any, may be done in the question booklet itself. Answers must not be ticked in the question booklet.
- There shall be negative marking. A deduction of 0.25 marks shall be there for each wrong answer. Each correct answer will be awarded one full mark. Cutting, erasing, overwriting and more than one answer in OMR Answer-Sheet will be treated as incorrect answer.
- 7. Use only Black or Blue Ball Point Pen of good quality in the OMR Answer-Sheet.
- 8. Before answering the questions, the candidates should ensure that they have been supplied correct and complete booklet. Complaints, if any, regarding misprinting etc. will not be entertained 30 minutes after starting of the examination.

Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(D)

1,	If supply to one terminal of three phase core type transformer connected in star-delta
	fails, assuming magnetic circuit symmetry, voltage on secondary side at no load
	will be:

- (1) 345, 115, 115 (2) 230, 115, 115 (3) 230, 230, 115 (4) 345, 0, 345
- 2. The windings of a Q kVA, V_1/V_2 volts, three phase delta connected core type transformer are connected to operate as single-phase transformer. The maximum voltage and power rating of new configuration shall be:
 - (1) V_1/V_2 , 3Q
- (2) $\sqrt{3} V_1/V_2$, 2Q (3) V_1/V_2 , Q/3
- $(4) 2 V_1/V_2, 20/3$

3. An effectively grounded system has:

- (1) $0 \le X_0/X_1 \le 3$, $R_0/X_1 > 1$
- (2) $0 \le \overline{R}_0 / X_1 \le 1, X_0 / X_1 > 3$
- (3) $0 \le X_0/X_1 \le 3, 0 \le R_0/X_1 \le 1$
- (4) $0 \le X_0/X_1 \le 1, 0 \le R_0/X_1 \le 3$

4. A 50 Hz 220/400, 50 kVA, single-phase transformer operates on 220 V, 40 Hz supply with secondary winding. Then:

- (1) The eddy current loss and hysteresis loss of the transformer increases
- (2) The eddy current loss and hysteresis loss of the transformer decreases
- (3) Hysteresis loss of the transformer increases while eddy current loss remains same
- (4) The eddy current loss decreases while hysteresis loss remains same.
- 5. Which of the following should be the operating value for a relay in radial system according to Indian Standard specifications?
 - $(1) \leq 1.2 I_{\text{setting}}$
- $(2) \geq 1.3 I_{\text{setting}}$
- $(3) \geq 1.5 I_{\text{setting}}$
- $(4) \geq 1.73 I_{\text{setting}}$
- 6. A fuse wire of circular cross-section with 0.8 mm radius blows off at a current of 8 A. What should be the radius of the wire to blow at a current of 1 A?
 - (1) 1.6 mm
- (2) 0.4 mm
- (3) 0.2 mm
- (4) 0.1 mm

7. In a biased differential relay the bias is defined as the ratio of:

- (1) Fault current and operating current
- (2) Operating coil current and restraining coil current
- (3) Number of turns of restraining and operating coil
- (4) Fault current and restraining coil current

Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(D)

 (1) Current magnitude is very small (2) The restriking voltage is very high (3) The current has a leading power factor (4) None of the above 9. A differential relay measures the vector difference between: 	
(2) The restriking voltage is very high(3) The current has a leading power factor(4) None of the above	
(3) The current has a leading power factor(4) None of the above	
(4) None of the above	
9. A differential relay measures the vector difference between:	
(1) Two currents	
(2) Two voltages	
(3) Two or more similar electrical quantities	
(4) None of the above	
10. In an impedance relay, fault current is maximum if fault occurs near the:	
(a) Contain at the line	
(1) Realy (2) Center of the fine (3) Transformer (4) None of the above	
(6)	or when
11. A wound rotor induction motor is preferred over squirrel cage induction mot	or wner
the major consideration involved is:	
(1) High Starting Torque (2) Low Starting Torque	
(3) Limited range speed control (4) All of these	
12. The shunt resistance component in the equivalent circuit obtained by no-load to	st of an
induction motor, is representative of: (1) all losses (2) Windage and friction losses	
(3) Core losses (4) Copper losses	
13. a. The rotor of squirrel cage induction motor has short circuited distributed w on it.	indings
b. The stator of squirrel cage induction motor has concentrated windings on it.	
(1) Statement a is true (2) Statement b is true	
(3) Both are true (4) None is true	
14. a. The starting torque of the three phase induction motor is zero and inclinearly.	creases
b. The starting torque of a three phase induction motor can be increased additional rotor resistance.	1 with
(1) Statement a is true (2) Statement b is true	
(3) Both are true (4) None is true	
Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(D)	

15.			and rotor type of three phase induction motor.
	b.	•	FF" switches and does not have any control of
		starting current.	
	(1)	Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true
16.	a.	The three phase induction motor is characteristic zone.	always operated in the negative Torque-slip
	b.	The negative Torque-slip character towards zero slip.	istic zone is beyond maximum torque point
	(1)	Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true
17.	a.	The slip is the difference of synchro induction motor.	nous speed and actual speed of the three phase
	b.	The slip is always proportional to to	rque of the three phase induction motor.
	(1)	Statement a is true	(2) Statement b is true
	(3)	Both are true	(4) None is true
18.	a.	3000 rpm.	on motor generates rotating magnetic field at
	b.	The stator of a three phase, induction	on motor controls the slip of the rotor.
	(1) Statement a is true	(2) Statement b is true
	(3) Both are true	(4) None is true
19	. a.	The efficiency of a three phase indu	ction motor shall be less if the air gap is large.
	b.	The large air gap shall lead to poor	power factor in a three phase induction motor.
	(1) Statement a is true	(2) Statement b is true
		B) Both are true	(4) None is true
20). a	supply.	tion motor is dependent of frequency of voltage
	b	. The actual speed of the induction n motor.	notor is dependent on the number of poles of the
	(1) Statement a is true	(2) Statement b is true
	(3) Both are true	(4) None is true
Ph.	D-E	E-December, 2024/(Electrical Engg.)	(SET-X)/(D) P. T. O

5 31. In India, which organisation performs the role of Independent System Operator: (4) POSOCO (3) CERC (2) PGCIL (1) CEA 32. Snubber circuit is used to limit the: (2) Rise of voltage across device (1) Rise of current (4) Commutation period (3) Conduction period The dimension of outer conductor are b and c and that of inner conductor is a, the ratio 33. of inner and outer current densities is: $(4) (cb)/a^2$ (2) $a^2/(c^2-b^2)$ (3) (c-b)/a(1) $(c^2 - b^2)/a^2$ The following statement is correct for uniform plane waves: (1) The wavelength λ is longer and velocity v is higher in all real media than they are 34. in free space (2) The wavelength λ is longer and velocity v is lower in all real media than they are in free space (3) The wavelength λ is shorter and velocity v is higher in all real media than they are in free space (4) The wavelength λ is shorter and velocity v is lower in all real media than they are in free space 35. A lossless dielectric slab has $\varepsilon_R = 9$. Its intrinsic impedance is: (4) $30 \pi\Omega$ (3) $40 \pi\Omega$ (2) $120 \pi \Omega$ (1) $360 \pi \Omega$ **36.** If $D = 10 y^2 a_x + 10 x^2 y a_y + 15 a_z$, the total charge enclosed within the region 0 < x, y, z < 1m is: (4) 5/3 C (3) 10/3 C (2) 20/3 C (1) 40/3 C 37. A perfect dielectric medium has a uniform plane wave. Which of the following statements for the wave are correct? (1) The electric and magnetic fields are in the same direction (2) The electric and magnetic fields are perpendicular to each other (3) The electric and magnetic fields are opposite to each other (4) The electric and magnetic fields do not occur in the medium The magnetic flux density in the air gap between two iron surfaces is Bg. The force between the iron surfaces at this flux density is F. If the flux density is reduced to (3/4) B_g, the decrease in the force would be: (4) None of the above (3) (1/4) F(2) (7/16) F(1) (3/4) F

Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(D)

D

39.	In a full-wave contr	olled rectifier	(center	tap transforn	ner connection), if ac	supply is
	230 V, 50 Hz, the Pl	V required for	SCRs s	hall be:		
	(1) 230 V	(2) 325 V	(3	6) 460 V	(4) 650 V	
40.	In a half-wave rect ripple at output, if th	ifier with a shu e frequency of	ac supp	ly is 50 Hz.	r, what is the freque	ncy of ac
	(1) 25 Hz	(2) 50 Hz	(3) 100 Hz	(4) Zero Hz	
47.	An alternator is said	to be over excit	ed whe	n it is operati	ng at:	
,	(1) Leading power f	actor) Lagging po		
	(3) Unity power fact	or	(4) None of the	ese	
42.	In a transformer hyst	eresis and eddy				
	(1) Load current		(2)	Supply freq	uency	
	(3) Maximum flux d	ensity	(4)	(2) and (3)	both	
43.	Role of power system	ı stabilizer in ex	citation	system is to	:	
	(1) Provide de power	to the synchro	nous ma	achine field w	vinding	
	(2) Processes and am	plifies input cu	rrent sig	gnal		
	(3) Provide an additi	onal input signa	l to reg	ulator to dam	p power system oscill	lation
	(4) Provide an addition	onal input signa	l to reg	ulator to boos	t system frequency	
44.	Resistance switching	is normally em	oloyed i	n :	1 4 4 4 4 4	
	(1) Bulk oil breakers		(2)	Minimum oi	l breakers	
	(3) SF6 circuit breake	ers	. ,	Air blast circ		
45.	The arc voltage in a ci	rcuit breaker is	:			
	(1) In the phase with	arc current	(2)	Lagging the	arc current by 90°	
	(3) Leading the arc cu	irrent by 90°			arc current by 45°	
46.	A negative sequence re	elay is common	ly used	to protect :		
	(1) Transformers		(2)	Transmission	lines	
	(3) Alternators		(4)	Bus bar		
47.	If the fault current is 3 the plug setting multip	000 amps, the r	elay set	ting 50% and	the C.T. ratio is 400	/5, then
	(1) 25 amps (2) 15 amps	(3)	50 amps	(4) 30 amps	
				•		

48.	In a HRC fuse the time between the	e cut off and the final current zero is called?	
	(1) Pre- arcing time	(2) Arcing time	
	(3) Total operating time	(4) Dead time	
49.	Bimetallic thermometer measures	emperature in the following range:	
		00 °C (3) 700 to 1500 °C (4) 45 to 500°C	
EO	Thermistor is a transducer. Its ten	perature coefficient is	
50.	(1) Negative (2) Positive	(3) Zero (4) Infinite	
51.	Actual tripping of a static relay is		
	(1) IGBTs	(2) Thyristors	
	(3) UJTs	(4) None of the above	
52.	By increasing the transmission v	tage to double of its original value, the same power	
	can be dispatched keeping the line		
	(1) Equal to original value	(2) Half the original value	
	(3) Double the original value	(4) One-fourth of original value	
53.	For the synchronous generator co	nected to an infinite bus through a transmission line,	
	how are the change of voltage (A power (P) and the reactive power	V) and change of frequency (Δf) related to the active Q) ?	
	(1) ΔV is proportional to P and ΔV	to Q (2) ΔV is proportional to Q and Δf to P	
	(3) Both ΔV and Δf are proportion	I to P (4) Both ΔV and Δf are proportional to Q	
54.		ne has a length of 10 cm. Find the lowest resonant	
	frequency if the line is air filled:		
	(1) 374.5 MHz (2) 474 MH	(3) 581 MHz (4) 749 MHz	•
55.	Which one of the following is parameters?	alid for short transmission lines in terms of ABCD)
	(1) $B = D = 0$ (2) $C = 0$	(3) $A = B = 1$ (4) $A = C = 1$	
56.	voltage and energy stored of the the capacitors are connected in p parallel combination are V/2 and	s C and 2C are connected in serices. The terminal series combination are V and Wse respectively. Next arallel. The terminal voltage and energy stored of the Wpa respectively. The ratio of Wse/Wpa is:	t
	(1) 16/9 (2) 8/9	(3) 4/9 (4) 2/9	
Ph.D	Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(D) P. T. O.		

57.	The complex electric and magnetic field of real and imaginary parts are $E =$ quantities are amplitudes. Which of the	I intensities in an electromagnetic field in terms $(E_a + jE_i)a_x$ and $H = (H_a + jH_i)a_y$ where the following expressions gives the real part of the
	complex pointing vector: (1) $(E_x(t)H_y(t) - E_y(t)H_x(t))a_z$ (3) $(E_x(t)H_x(t) - E_y(t)H_y(t))a_z$	(2) $(E_x(t)H_y(t) + E_y(t)H_x(t))a_z$ (4) $(E_x(t)H_x(t) + E_y(t)H_y(t))a_z$
58.	Which material is used for indoor bus b (1) Copper (3) Silver	ar ? (2) Aluminium (4) Galvanized steel
59.	The load sharing between two steam adjusted by varying the: (1) Power factor (3) Steam supply to the prime mover	driven alternators operating in parallel may be (2) Speed of the alternator (4) None of these
<i>j</i> 60.	Overspeed protection of generator is do (1) Differential relay (3) Alarm	ne by: (2) Over current relay (4) Governor
61.	Which of the following is a desirable cl (1) High drift (3) High fidelity	(2) High measuring lag (4) Poor reproducibility
62.	Which of the following in the flue g Zirconia probe? (1) Oxygen (3) Carbon monoxide	ases going out of the furnace is measured by (2) Carbon dioxide (4) Temperature
63.	Working principle of mercury in glass (1) Volumetric expansion (3) Linear expansion	thermometer is based on following: (2) Pressure rise with temperature (4) Temperature rise with pressure
64.	Gamma rays is used for the measurement (1) Pressure (2) Temperature	
65.	Which of the following is not a different (1) Rota meter (2) Flow nuzzle	
Ph.D-	EE-December, 2024/(Electrical Engg.)	

66.	Which of the following is not a variable	area flow meter?
00.	(1) Rota meter	(2) Piston type meter
	(3) Venturi meter	(4) Magnetic flow meter
	Which one of the following uses the prin	
٠,١٥	(1) Ammeter (2) Voltmeter	(3) Galvanometer (4) Gauss meter
68.	In automatic generation control the volta	age and frequency is controlled by:
00.	(1) Controlling the excitation	
	(2) Controlling the turbine action	94 T 3
	(3) Excitation control for voltage and to	urbine speed control for frequency
	(4) Turbine speed control for voltage as	nd excitation control for frequency
69.	Unit up- time in unit commitment probl	(2) A unit minimum repair time
	(1) A unit minimum operating time	(4) A unit minimum designing time
	(3) A unit total life time	
70.		andard surrounded by 25 aluminium conductor
	will be specified as:	(4) 25/22
	(1) 7/25 (2) 7/32	(3) 25/7 (4) 25/32
71	A single diode operates as a:	
	(1) Capacitor	(2) Bridge Rectifier
	(3) Full Wave Rectifier	(4) Half Wave Rectifier
		20 dissipate aball bo
72.	The ratio of latching current / holding c	urrent in a 20 thyristor shall be.
	(1) Less than 1 (2) More than 1	(3) Equal to 1 (4) Any of these
73.	If an AC voltage wave is corrupted waveform differs from of:	ith an arbitrary number of harmonics, then the its fundamental frequency component in terms
	(1) Only the peak values	(2) Only the RMS values
	(3) Only the Average values	(4) All of these
74.	The anode current through a conducting the anode current shall be:	g SCR is 10A. If its gate current is doubled, then
	(1) Zero (2) Doubled	(3) Halved (4) Same
Ph.D	-EE-December, 2024/(Electrical Engg.)	(SET-X)/(D) P. T. O

10			1' Lagries S	de current of 10 A and		
75.	The RMS value of resu	iltant current in a w	ire which carries a	dc current of 10 A and a		
	sinusoidal alternating c	17.3 A (3) 22.4 A	(4) 30 A		
	(1) 14.122	- dimently converts	polyphase AC vol	tages from one frequency		
76.	The thyristor circuit that to another frequency is	known as:	P 71			
	(1) Cycloconverter	(2) Inverter			
	(3) Converter	(4) Chopper			
77.	If a single diode, fed from	om an AC source, is	supplying to a pur	re inductor, it will conduct		
	for:) 270°	(4) 360°		
78.	ting the motifier supplying a highly inductive load with					
	(1) sinusoidal (2)	constant DC (3) triangular	(4) square		
79.	Snubber circuit is used to limit the Rate of:					
	(1) Conduction period) Commutation Po	eriod		
	(3) Rise of voltage acro	oss device (4) Rise of Current			
80,	An SCR is considered t	to be a semi-controlle	ed device because	:		
	(1) It can be turned OF	F but not ON by gat	e pulse			
	(2) It can be turned ON but not OFF gate pulse					
	(3) It conducts during only half cycle of AC wave					
	(4) It can be turned ON	I during only half cy	cle of AC wave			
/81.	. The Newton Raphson method is also called as:					
	(1) Tangent method	(2	Secant method			
	(3) Chord method	(4)) Diameter metho	d		
82.	For a given x-y plot, the value of y/x in terms of the angle θ is given by:					
			_	(4) Cosec θ		
83.	Laplace transform of f(1			.,		
03.	(1) $s/(s + a)$ (2)		\ 1// ₂ : \	in the second		
	(1) $3i(3+4)$, (2)	(3-a)	1/(s+a)	(4) $1/(s-a)$		
Ph.D-E	E-December, 2024/(El	ectrical Engg.)(SET	C-X)/(D)			
7		88 / 32				

84.	Laplace transform of	the unit step function	on u(t):	40.4		
	(1) $1/s^3$	(2) $1/s^2$	(3) 1/s	(4) 1		
. 05	The Fourier series fo	$r f\{x\} = sin^2 x define$	d over range of $-\pi \le$	$x \le \pi$ is:		
85.	(1) $\{\frac{1}{2} - (\sin 2x)/2\}$		(2) $\{ \frac{1}{2} + (\sin 2x) \}$	21		
	(3) $\{\frac{1}{2} - (\cos 2x)/2\}$		(4) $\{\frac{1}{2} + (\cos 2x)\}$	72 }		
	(3) (7)	of V ³ i	n the range of -1	< X < 1 with periodic		
86.		expansion of A	in the range or 1			
	continuation has:	**************************************	(2) Only Sine Terr	ns		
	(1) Only Cosine Ter(3) Both Sine and C		(4) Can't be said			
87.	Find the wrong one	from the following s	tatements:	dizahle		
	 (1) If A is diagonalizable and invertible, then A⁻¹ is diagonalizable. (2) If A is diagonalizable, then A^T is diagonalizable. 					
	(2) If A is diagonali	zable, then A is dia	igonalizable.	multiplicity 1 then A is		
	diagonalizable.			multiplicity 1, then A is		
	(4) An n x n matrix with fewer than n distinct eigenvalues is not diagonalizable.					
88.	88. If A and B are square matrices of the same order, then tr(AB) =					
00.	(1) tr (BA)	(2) $tr(A + B)$	(3) $tr(A) + tr(B)$	(4) tr (A) tr (B)		
90	A linear system is ca	alled consistent if it	has:			
89.	(1) At least one solu	ution a sais 17 to	(2) infinitely solu	tions		
	(3) no solutions		(4) None of these			
,		ONE R STREET				
90.	Following method i	s used for finding th	e minima or maxim	a for a unimodal function:		
			(2) Interval halvin(4) All of these	ing		
	(3) Region eliminat	the trade of the terror		·		
91.		of alternating curre	ent is representation	n of equivalent DC value in		
	terms of:	(2) heat generation	n (3) mass transfer	(4) voltage generation		
		N.				
92.	The power density	of a three phase syst		a single phase system is:		
	(1) higher	(2) lower	(3) equal	(4) fluctuating		
Ph.D	-EE-December, 2024	/(Electrical Engg.)	(SET-X)/(D)	P. T. O.		

		the obtained parameters are			
93.					
	representative of .	(2) Windage and friction losses			
	(1) All losses	(4) Copper losses			
	(3) Core losses				
94.	The blocked rotor test of a three-phase	induction motor is equivalent to:			
	(1) Heat run Test	(2) No load 10st			
	(3) Open Circuit Test	(4) Short Circuit Test			
95.	The direct on line (DOL) starting in ratings:	a three phase induction motor is provided for			
		(3) up to 5 hp (4) Not at all			
96.	The star-delta starter is used in a three at:	phase induction motor to provide starting torque			
	(1) increased current	(2) reduced current			
	(3) increased voltage	(4) None			
97.	For high starting torque in a squirrel provisions of:	cage induction motor the rotor is made with			
	(1) Double cage	(2) External resistance			
	(3) External supply	(4) All of these			
98.	An induction motor will run at synchron	nous speed:			
	(1) At no load (2) At light load	(3) At rated load (4) Never			
99.	roung magnetic field and rotor slip, res				
		(3) 1000 rpm, 10% (4) 1000 rpm, 5%			
100.	The developed starting torque of an indua tapping of 30% is 80 Nm. If the tap 60%, then the starting torque shall be:	oping of auto-transformer starter with			
	(1) 40 Nm (2) 160 Nm	(3) 240 Nm (4) 320 Nm			

Ph.D-EE-December, 2024/(Electrical Engg.)(SET-X)/(D)

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