Reg No.:

Name:

## APJ ABDUL KAĻAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S6 (S, FE) / S6 (PT) (S, FE) Examination December 2024 (2019 Scheme) HURUT

#### **Course Code: EET 308**

**Course name: COMPREHENSIVE COURSE WORK** 

Max. Marks: 50

Duration: 1Hour

Instruction (1) Each question carries one mark. No negative marks for wrong answers
(2) Total number of questions: 50
(3) All questions are to be answered. Each question will be followed by 4 possible answers of
which only ONE is correct.
(4) If more than one option is chosen, it will not be considered for valuation.

1. Reciprocity theorem is applicable to ?

- a) linear and bilateral b) linear and c) All electrical d) Non-linear circuits only. only.
- 2. Calculate the current in Amps through the 12  $\Omega$  resistor?



What is an undamped electric circuit?

c) 0.6

d) 1

3.

4.

Inductive-Resistive-**Pure Resistive** b) Pure capacitive d) a) c) Inductive-Capacitive capacitive In Fig. A what is Thevenin's impedance across the terminals of the 12 resistor? c) 0Ω 3Ω 2Ω b) 1/2Ω d) a)

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11	What is the function of a buffer circuit?									
	a)	To provide an output equal to its input	b)	To clean up the input	c)	To clean up the output	d)	To provide an output that is inverted from that on the input		
12	Simplify $Y = AB' + (A' + B)C$ . ?									
	a)	<b>AB'</b> + C	b)	AB + AC	c)	A'B + AC'	d)	AB + A		
13	Wh dev	hich method of error	-dete	cting codes enables t	o finc	l double errors in I	Digita	l Electronic		
	a)	Parity method	b)	Check sum	c)	Odd-Even	d)	Bit generation method		
14	Add the two BCD numbers: $1001 + 0100 = A$ ?									
	a)	A=10101111	b)	A= 1010000	c)	A=00010011	d)	A= 00101011		
15	Logic circuitry is used to detect									
	a)	Underflow	b)	Overflow	c)	MSD	d)	LSD		
16	What are the most fundamental gates in MOS logic family?.									
	a)	AND, NAND	b)	NAND, NOR	c)	OR, NOR	d)	OR, NOTR		
17	A modulus-10 counter must have									
	a)	10 flip-flops	b)	4 flip-flops	c)	2 flip-flops	d)	Synchronous clocking		
18	In	a 4-bit Johnson cour	nter s	equence, there are a	total o	of how many states	or bi	t patterns?		
	a)	1	b)	2	c)	4	d)	8		
19	9 What is the preset condition for a ring shift c									
	a)	All FFs cleared to 0	b)	All FFs set to 1	c)	A single 0, the rest 1	d)	A single 1, the rest 0		
20	A bidirectional 4-bit shift register is storing the nibble 1110. Its input is LOW. The nibble 0111 is waiting to be entered on the serial data-input line. After two clock pulses, the shift register is storing									
4	a)	1110	b)	0111 -	c)	1011	d)	1001		
21	A ari ac	240 V, dc shunt mot mature resistance is ross the armature res	or dr 0.5 Ω sistar	raws 15 A while supp and the field windin the when plugging	olying ig resi	the rated load at a istance is $80\Omega$ . When $240V$	speed hat is t	d of 80 rad/s. The the net voltage		
	a)	6.Y	b)	234V	c)	240 v	u)	T/TV		
22	In ((	a DC machine, which CW) and Interpole W	ch of /indi	the following statem ng (IW)? ?	ients i	is true about Comp	ensati	ing winding		

E.

	a)	CW neutralises armature reaction; IW produces residual	b)	CW neutralises armature reaction; IW improves commutation	c)	CW improves commutation; IW produces residual flux	d)	CW improves commutation; IW neutralises armature reaction			
23	Whi	ich DC generator ca	n be	used as a booster in a	a DC	power system?					
	a)	Shunt	b)	Series	c)	Shunt	d)	Cumulative compound			
24	The armature of a 220 V DC shunt motor is wound in lap to										
	a)	Avoid sparking	b)	Reduce cost	c)	Reduce loss	d)	Increase power output			
25	Which is the dc motor that can give zero speed regulation at full load without a controller?										
	a)	Differential compound	b)	Series	c)	Shunt	d)	Cumulative compound			
26	In a	transformer, zero v	voltag	e regulation at full l	oad i	S					
	a)	possible at leading power factor load	b)	possible at unity power factor load	c)	Not possible	d)	possible at lagging power factor load			
27	Two transformers are to be operated in parallel such that they share load in proportion to their kVA ratings. The rating of the first transformer is 500 kVA and its pu leakage impedance is 0.05 pu. If the rating of second transformer is 250 kVA, its pu leakage impedance is?										
	a)	0.2	b)	0.1	c)	0.05	d)	0.025			
28	28. Wh and eff	A single-phase tran nen a short-circuit te d HV windings, mea iciency?	nsforr est is asure	ner has no-load loss performed on it with d loss is 81W. At wh	of 6 90% at lo	4 W, as obtained fr 6 of the rated curre ad does the transfo	om an nts flo ormer h	open circuit test. wing in its both LV have maximum			
	a)	50%	b)	60%	C)	) 80%	d)	88.8%			
29	29 rea	. The equivalent cirn transformed to $X_M$ . Their r	cuit o nagni	f a transformer has l tudes satisfy:	eaka	ge reactances, X1	, X2	and magnetising			
	a)	X1>>X2>>XM	b)	X1< <x2<<xm< td=""><td>c</td><td>) <math>X_1 \simeq X_2 &gt;&gt; X_M</math></td><td>d)</td><td><math>X_1 \underline{\sim} X_2 \leq X_M</math></td></x2<<xm<>	c	) $X_1 \simeq X_2 >> X_M$	d)	$X_1 \underline{\sim} X_2 \leq X_M$			
30	30. A single-phase transformer with a turns ratio 1:2 is connected to a pure resistive load. The secondary and magnetising currents are 1A. Neglecting core losses and leakage reactances the primary current is										
	a)	3 A	b)	2.24A	с	) 2A	d)	1.41A			
31	D	etermine the even co	ompo	nent of the signal: x	(t)=c	os(t+ 45 <sup>0</sup> )+sint.					
	a)	sin 2t	b	) sin t	С	cos (t+ $45^{\circ}$ )	d)	cos t			
32	32	2. For an energy sign	nal					_			
	a)	E=0	b	) P=0	C	c) E=∞	d)	<b>P</b> = ∞			
33	What is the period of the following signal, $x(t) = 5 \cos(24 t + 60^{\circ})$ ?										
	a)	12	b	) 24π		c) 1/12	d)	1/24π			

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How are x(t) and y(t) related? Y (1) X (t) -1 Ô 1 b) Y(t) = dx(t)/dtc) Y(t) = x(t/2)d) Y(t) = x(t-1) $Y(t) = \int x$ a) (t).dt Given  $f(t) = [\cos (3t)]^2$ . The value of L {f(t)} is 35 b)  $36/(s^2+36)^2$  $s^{2}/(s^{2}+36)^{2}$ c)  $(s/(s^{2}+9))^{2}$ 1/2[1/s +s d) a)  $(s^2+36)$ ] Find the initial value of f(t) if  $F(s) = \frac{\omega}{(s+\alpha)^2 + \omega^2}$ 36 c) 1 d) -1 a)  $\infty$ b) 0 37 Bandwidth of the gate function is  $2/\tau$  Hz b)  $1/\tau$  Hz c)  $2\tau$  Hz d) a) THz Find the Z-transform of u[-n] 38 c) z/(z+1)-1/(z-1)a) 1 b) z/(z-1)d) 39 Find the transfer function of the following system using Mason's formula: G<sub>1</sub> G<sub>2</sub> X1  $\mathbf{x}_2$ R -H  $(G_1+G_2)/(1+G_1H)$ c)  $G_1/(1+G_1H)$ **d**)  $G_1/(1+G_2H)$ b)  $G_2/(1+G_1H)$ a)  $+G_2H$ ) 40 Effect of feedback on sensitivity is minimum in: 5 Neither OL nor Both OL and CL d) b) Closed loop a) Open loop c) systems CL systems systems systems Which power plant can handle both base load and peak load operations effectively? 41 c) Nuclear d) Diesel Hydroelectric **b**) Thermal a) A power system has a maximum load of 20 MW. Annual load factor is 50%. The reserve 42 capacity of plant in MWH is \_\_\_\_\_ if the plant capacity factor is 40%. d) 8.75 3.75 b) 5 c) 46.75 a) 43. Ferranti effect is very prominent in occurrence in what type of transmission line? 43 Short, unloaded c) Long, loaded d) Long, unloaded b) Short, loaded a)

	44	Wh imp	at will happen when bedance	the o	characteristic impeda	nce o	of a transmission lin	ne is e	equal to the load		
51		a)	Load will reject all the given energy	b)	Given energy is lost as line loss	c)	Resonance	d)	Load will absorb all the given energy		
	45	An Wh	overhead transmission at will be the maxim	on li um s	ne has a span of 282. sag if the working ten	8 me	tres the conductor v is 2000 kg.	weigh	ing 0.2 kg/m.		
	•	a)	1m	b)	0.5m	c)	1.2 m	d)	0.33 m		
	46	In e	extra High Voltage li line conductors for p	nes, prote	which conductor mat ction against lightnin	erial g?	is used for ground	wire	provided above		
		a)	ACSR	b)	Hard drawn copper	c)	Cadmium copper	d)	Stranded galvanised steel		
	47	The surge impedance of multiple conductor lines as compared to single line is									
		a)	Higher	b)	Lower	c)	No change	d)	Varies according to the length		
	48	If an industrial consumer consumes 50 kW for 4 hours, 300 kW for 15 hours and 60 kW for 5 hours daily and the tariff rate is Rs 5/kWh. What is the energy consumption in a month of 30 days in lakhs of rupees?									
		a)	7.5	b)	7.75	c)	4.7	d)	4.75		
	49	Wh	at of the below ment	tione	d statements are inco	rrect	as compared to the	HVI	DC system?		
		a)	Reactive power compensation	b)	Distance limitation	c)	More corona loss	d)	Back to back connection possible		
	50	To increase the power despatch of an existing transmission line install									
		a)	Series capacitors	b)	Shunt capacitors	c)	Series reactors	d)	Shunt reactors		

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