Page 1

# QUESTION BANK 2016

#### SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR

Siddharth Nagar, Narayanavanam Road – 517583

#### **QUESTION BANK (DESCRIPTIVE)**

Subject with Code : EM-III (13A03701)

Year & Sem: III-B.Tech & I-Sem

Regulation: R13

#### <u>UNIT –I</u> <u>SYNCHRONOUS GENERATORS</u>

1. A) Explai	n the principle of operation of Synchronous Generator.	5M
B)Compar	e between DC Generator and AC Generator	5M
2. Explain th	ne constructional details of salient pole and Round rotor machines	10M
3. Explain th	ne different types of Armature windings	10M
4. Write sho	rt notes on a) Pitch factor	5M
	b) Distribution factor	5M
5. Derive the	e EMF equation of an Alternator from fundamentals	10M
6. Define Ha	armonics and how the harmonics are generated in EMF wave form? How they are	
suppressed	1	10M
7. Define An	mature reaction? Discuss the armature reaction at UPF, lagging PF and leading PF v	vith
Necessary	v wave forms	10M
8. Calculate	the rms value of induced voltage per phase and line of a 10pole, 3Ø, 50HZ, alternated	or with
2 slots per	r pole per phase and 4conductors per slot. If the coil span is $150^\circ$ electrically. If the f	lux per
Pole has a	a fundamental component of 0.12wb and 20% of 3 <sup>rd</sup> harmonic component	10M
9. Find the r	number of armature conductors are connected in Series per phase required for the arm	nature
Has 3-Ø,	10pole alternator with 90slots, the winding is to be star connected with a given line v	/oltage
of 11KV.	Assume flux/pole is 0.16wb.	10M
10. Define	a) Effective resistance	2M
	b) Leakage reactance	2M
	c) Armature reactance	2M
	d) Synchronous reactance	2M
	e) Synchronous impedance	2M



Course & Branch: B.Tech - EEE

6

#### <u>UNIT –II</u>

#### **REGULATION OF SYNCHRONOUS GENERATORS**

1. How do you calculat	e Synchro	nous rea	ctance ex	xperiment	ally with	suitable te	sts 10M
2. Explain the procedur	e for calc	ulation v	oltage re	gulation b	y synchro	onous impe	edance method with $_{\rm f}$
Phasor diagram							10M
3. A $3-\Phi$ star connected	alternato	r is rated	l at 1600	KVA and	synchron	ous reactai	nce are $1.5\Omega$ and
$30\Omega$ respectively. C	alculate th	e voltag	e regulat	ion by EN	IF method	d for a load	l of 1280KW at
a)0.8PF lagging	b) UPF		c)0.8PF	leading			10M
4. The following test re	sults are o	btained	on a 3-Ф	, 6600V, 1	50HZ star	connected	l alternator as follows
$I_{f}(A)$	16	25	37.5	50 ′	70		
V <sub>oc</sub> (V	7) 3100	4900	6600	7500	8300		
A field current of 20	A is neces	ssary to o	circulate	the full lo	ad curren	t on short	circuit of the alternator.
Determine voltage r	egulation	by MMF	F method	at			
a) 0.8PF lagging	b) 0.8I	PF leadin	lg c) UF	ΡF			10M
5. a) Explain the proce	dure for c	onstructi	on of po	tier triang	le by ZPF	method	5M
b) How do you calcu	alate the n	o load v	oltage an	d voltage	regulatior	n bye ZPF	method with phasor
diagram							5M
6. A 11KV,1000 KVA	, 3- $\Phi$ star	connecte	ed alterna	ator has a	resistance	of $2\Omega/\text{pha}$	ase. The O.C and FL
ZPFC are given belo	ow. Find the	he voltag	ge regulat	tion of an	alternator	for FL cu	rrent at 0.8PF
Lagging by potier m	ethod						10M
	$I_{f}(A)$	40	50	110	140	180	
	$V_{oc}(V)$	5800	7000	12,500	13,750	15,000	
	V <sub>zpf</sub> (V)	0	1500	8500	10,500	12,500	
7. By using the above	data calcu	late the v	voltage re	gulation	by ASA n	nethod. Co	mpare the results and
comment them.							10M
8. Explain the procedur	e for calc	ulation o	f voltage	regulatio	n of salier	nt pole Alt	ernator and draw the
suitable phasor diag	ram and as	ssumptio	ons.				10M
9. A $3\Phi$ star connected	synchron	ous gene	rator sup	plies a cu	rrent of 10	OA having	phase angle of $20^{\circ}$
Lagging at 400 V. Fi	ind the loa	d angle	and comp	ponents of	armature	current. It	f X <sub>d</sub> =10 $\Omega$ , X <sub>q</sub> =6.5 $\Omega$
Assume R <sub>a</sub> is neglec	ted. Find t	he no lo	ad EMF	and voltag	ge regulati	on.	10 <b>M</b>
10. a) Define synchrone	ous imped	ance as j	per O.C a	and S.C te	sts		2M
b) What is the meaning of potier reactance					2M		
c) What are the features of short circuit ratio						2M	
d) Express the form	ulae for di	rect and	quadratu	re reactar	nces		2M
e) Define load angle	and phase	e angle					2M

e) Define load angle and phase angle

#### <u>UNIT-III</u>

#### PARALLEL OPERATION OF SYNCHRONOUS GENERATORS

1. a) Define infinite bus bar? Explain synchronization of alternator with infinite bus bar	5M
b) Necessity of parallel operation of alternators	5M
2. Derive the expression for power developed of an alternator connected to infinite bus bar with	ith
Power angle characteristics	10M
3. Derive the expression for synchronizing current, synchronizing power and synchronizing	torque
	10M
4. A 5MVA, 10KV, 1500rpm,50HZ alternator runs in parallel with other machines. Its rea	ictance
drop is 20%. Find the synchronizing power per unit mechanical degree of displacement a	and the
corresponding torque at	
a) No load b) Full load at 0.8PF lagging	10M
5. What is meant by synchronization of alternators? Discuss any two methods of synchronization	tion of
alternator	10M
6. Derive the expression for circulating current for dissimilar alternators connected by a co	mmon
load	10M
7. Two 1-Ø alternators are operate in parallel and sharing a load impedance of $(3+j4)\Omega$	$I_{\rm f}$ the
impedances of each machine is $(0.2+j2)\Omega$ and emf's are $(200+j0)V$ and $(220+j2)$	0)volts
respectively. Determine	10M
a) Terminal voltage b) Current c) Power factor d) Output power of each machin	e
8. Explain in detail about 'V'curve and ' $\Lambda$ 'curve of a synchronous motor	10M
9. Determine Sub transient, Transient and steady state reactances of synchronous machine	
experimentally	10M
10. a) List out the conditions for parallel operation of alternators	2M
b) What are the methods used for synchronization of alternators	2M
c) write the formulae for power developed per phase of an alternator connected to an infin	ite bus
bar	2M
d) draw the power angle characteristics of synchronous machine	2M
e) Define synchronous current	2M

### <u>UNIT-IV</u>

#### **SYNCHRONOUS MOTOR**

1.	a) Explain the theory of operation of synchronous motor	5M
	b) Compare between synchronous motor and 3Ø induction motor	5M
2.	Draw and explain the phasor diagram of synchronous motor and derive the back EMF.	10M
3.	Draw the power flow diagram and explain the equation of different stages in synchronous	motor
		10M
4.	Explain the variation of current and power factor with excitation with suitable curves	10M
5.	Write short notes on	
	a) Synchronous condenser	5M
	b) Hunting and elimination of hunting	5M
6.	Briefly discuss about the starting methods of synchronous motor with suitable diagrams	10M
7.	a) Explain different torques in synchronous motor	5M
	b) Explain the working operation of synchronous induction motor	5M
8.	A 3-Ø, 6600V, 50HZ star connected synchronous motor takes 50A current from mains. T	he
	Resistance and synchronous reactance are $1\Omega$ and $20\Omega$ respectively.	
	i) Power supplied to the motor	
	ii) Induced emf /phase at 0.8PF lagging and 0.8PF leading	
	iii) Rotor retardation angle	10M
9.	A 3 $\emptyset$ , 330V, star connected synchronous motor has synchronous reactance of 5 $\Omega$ /phase.	Гhe
	input to the motor is 1000KW at a normal voltage and a line induced emf of 4000V. calcu	late the
	operating Power factor and line current	10M
10	. a) What is meant by synchronous phase modifier	2M
	b) Why the synchronous motor is a non self starting	2M
	c) Write the formulae for back EMF of synchronous motor at leading power factor and la	g PF2M
	d) What is the purpose of damper winding used in synchronous motor	2M
	e) List out the application of synchronous motor	2M

### <u>UNIT-V</u>

#### SINGLE PHASE AND SPECIAL MOTORS

1.	Explain the constructional details of single phase induction motor with neat diagram	10M
2.	Why single phase induction motor is non self starting explain	
	a) Double field revolving theory and	
	b) Cross field revolving theory	10M
3.	Explain the working of split phase induction motor? List out the advantages, disadvantage	es and
	applications	10M
4.	Explain the working operation of capacitor start and capacitor run induction motor . List of	out the
	advantages, disadvantages and applications	10M
5.	Briefly discuss about the shaded pole IM with circuit diagram mention their applications	10M
6.	Discuss the working operation of A.C Series motor? What are the drawbacks and their	
	remenders	10M
7.	Explain the working operation of Universal motor and list out the applications	10M
8.	Write short notes on a) single phase synchronous motor	3M
	b) Reluctance motor	3M
	c) Hysteresis motor	4M
9.	Explain the working operation of stepper motor? How do you calculate stepping angle and	list
	out the applications	10M
10	. a) State double field revolving theory.	2M
	b) Drawbacks of split phase induction motor	2M
	c) Compare permanent capacitor motor and two value capacitor motor	2M
	d) Write the current flow direction of shaded pole induction motor	2M
	e) Define stepping angle and no.of steps for revolution	2M

Prepared by: G.SESHADRI

QUESTION BANK	2016
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	QUESTION BAI	NK 2	2016
C)3600 rpm	D)3000 rpm.		
10. The armature reaction of an alternator	influences	[	]
A)windage losses	B)operting speed		
C)generated voltage per phase	D)waveform of voltage generated.		
11. For the same power rating, a lower vol	tage alternator will be	ſ	1
A)more efficient	B)larger in size	-	-
C) operating at high rpm	D)more costly.		
12. An alternator is supplying 10A to an i	nductive load at 220 V, while running at 10	00 rp	m. Now if
the speed of the alternator is reduced t	to 750 rpm but the field current remains unch	angeo	d, the load
current will become	L L	[	, ]
A)18 A	B)13.3 A	L	1
C)10 A	D)75A		
13 An alternator is rated for 75 kW at $0.8$	nower factor. It means that	ſ	1
A)alternator has 4 poles	power netor. It means that	L	1
B) alternator can supply 75 kW at $0.8$ r	nower factor		
C) alternator can supply 75 kW at 0.0 p	loads having power factor 0.8 only		
D)the peak officiency of alternator occ	were only at 75 kW load having 0.8 logging no	wor f	actor
D)the peak efficiency of anefhator occ	virs only at 75 KW load having 0.8 lagging pe	r	
14. Three phase alternators are invariably	Place terms of series are received	L	]
A)magnetic losses are minimized	B)less turns of wire are required		
C)smaller conductors can be used	D)higher terminal voltage is obta	ined	
15. The winding of a 4-pole alternator hav	ying 36 slots and a coil span of 1 to 8 is show	t pitc	hed by
degrees.		L	
A)140	B)80		
C)20	D)40		
16. If an alternator winding has a fractional	l pitch of 5/6, the coil span isdegrees.	[	]
A)300	B)150		
C)30	D)60		
17. Regarding distribution factor of an arm	ature winding of an alternator which stateme	nt is f	alse?
		[	]
A)it decreases as the distribution of	of coils [slots/pole] increases		
B)higher its value, higher the indu	ced e.m.f per phase		
C)it is not affected by the type of	winding either lap or wave		
D)it is not affected by the number	of turns per coil.		
18. When speed of an alternator is changed	l from 3600 rpm to 1800 rpm the generated e	.m.f/p	hases will
become		[	]
A)one-half	B)twice		
C)four times	D)one fourth		
19. The maximum possible speeds in rpm	at which an alternator can be driven to gene	rate v	oltages at
60Hz and 50Hz are respectively.	C	Γ	1
A)2000.2400	B)3000,3600	L	L
C)2400.2000	D)3600.3000		
20. The main disadvantage of using short r	pitch winding in alternators is that it	Г	1
A) reduces harmonics in the gener	rated voltage	L	L
B)reduces the total voltage around	the armature coils		
Electrical Machines-III			Page 7

C)produces asymmetry in the three phase windings	
D)increases 'cu' of end connections	_
21. What is the value of distribution factor for a uniformly distributed 3-phase winding?	]
A)60° phase spread is 0.955 B)60° phase spread is 0.8	
C) $60^{\circ}$ phase spread is 1 D) $60^{\circ}$ phase spread 2	
22. What will be the number of poles of a 50 Hz alternator if it runs at its greatest speed? [	]
A)4 B)0	
C)2 D)8	
23. The salient pole field structure has diameter and axial length [	]
A)large, large B)large, short	
C)short, short D)none	
24. The harmonic which would be totally eliminated from the alternator e.m.f using a fractional	
pitch of 4/5 is [	]
A)3 <sup>rd</sup> B)7 <sup>th</sup>	
C)5 <sup>th</sup> D)9 <sup>th</sup>	
25. For eliminating 7 <sup>th</sup> harmonic from the e.m.f wave of an alternator, the fractional pitch must	be
	]
A)2/3 B)5/6	
C)7/8 D) 6/7	
26. If, in an alternator, chording angle for fundamental flux wave is $\alpha$ , its value for 5 <sup>th</sup> harmonic	: is
, = =,,,,,	1
A)5 $\alpha$ B) $\alpha$ /5	L
$C)25 \alpha$ $D)\alpha/25$	
27 The magnitude of the three voltage drops in an alternator due to armature resistance, leakag	e
reactance and armature reaction is solely determined by	1
A)load current I. B)n f of the load	L
C)Whether it is a lagging or leading n f load D)field construction of the alternate	)r
28 The effect of armature reaction for an alternator for zero power factor lagging	,, 1
A) cross magnetizing	1
C)non_offective	
20 At leading n f the armeture flux in an alternator the rotor flux	1
29. At leading p.1 the armature flux in an alternator the fotor flux. [	]
A)opposes D)alus	
C)distorts D)does not affect	1
30. The power factor of an alternator is determined by its	]
A)speed B)load	
C)excitation D)prime mover	-
31. What parameter of load influences the armature reaction of an alternator?	J
A)power B)Voltage	
C)power factor of load D)none	
32. The effect of armature reaction for an alternator for power factor leading [	]
A)magnetizing B)wholly demagnetizing	
C)non-effective D)distorting	
33. When the load on an alternator is varied, its terminal voltage is also vary due to [	]
A)armature resistance B)armature leakage reactance	
Electrical Machines III	Dac

QUESTION BANK 2016 D)all of the above C)on account of armature reaction vary 34. In an alternator if the armature reaction produces demagnetization of the main field, the power factor should be ſ 1 A)Zero, lagging load B)Zero, leading load D)all of the above C)Unity. 35. In an alternator if the armature reaction produces magnetization of the main field the power factor should be ] A)Zero, lagging load B)Zero, leading load C)Unity. D)none 36. When an alternator is supplying unity power factor load, the armature reaction will produce 1 A)magnetisation of the main field B)demagnetisation of the main field C) distortion of the main field. D)none 37. When short pitch coils of 160 are used in an alternator, which harmonic component will not be present in the output emf? ſ 1 A)third B)fifth C)seventh D)ninth. 38. A 120 MW turbo alternator is supplying power to 80 MW load at p.f. lagging. Suddenly the steam supply to the turbine is cut off and the alternator remains connected to the supply network and the field supply also remains on. What will happen to the alternator? Γ 1 A)The stator winding of the alternator will get burnt B)The rotor winding of the alternator will get burnt C)The alternator will continue to run as a synchronous motor rotating in the same direction D)The alternator will continue to run as a synchronous motor rotating in opposite direction. 39. The rotor of the salient pole alternator has 24 poles. The number of cycles of emf in one revolution would be 1 A)24 B)12 C)6 D)4. 40. A 20 pole ac generator rotates at 600 rpm. The periodic time of current in seconds per cycle is ſ 1 B)0.004 A)0.009 C)0.008 D)0.01.

QUESTION BANK 2016 UNIT –II **REGULATION OF SYNCHRONOUS GENERATORS** 1. The regulation of an alternator is [ ] A)the reduction in terminal voltage when alternator is loaded B)the variation of terminal voltage under the conditions of maximum and minimum excitation C)the increase in terminal voltage when load is thrown off D)the change in terminal voltage from lagging power factor to leading power factor. 2. In an alternator if the armature reaction produces demagnetisation of the main field, the power factor should be 1 Γ A)Zero, lagging load B)Zero, leading load C)Unity. D) none 3. The Potier's triangle separates the Γ 1 A) iron losses and copper losses B)field mmf and armature mmf C)stator voltage and rotor voltage D)armature leakage reactance and armature reaction mmf. 4. The Potier's triangle separates ſ ] A)stator losses and rotor losses B)fixed losses and variable losses C)armature voltage and field voltage D)armature leakage reactance and armature reaction mmf. 5. Zero power factor method of an alternator is used to find its ſ 1 B)armature resistance A)field resistance D)voltage regulation. C)efficiency 6. The power factor of an alternator is obtained from its ſ ] A)excitation B)speed D)none of the above. C)load 7. Under no-load condition, power drawn by the prime mover of an alternator goes to ſ 1 A)produce induced emf in armature winding B)meet no- load losses C)produce power in the armature

QUESTION BANK 2016 D)meet cu losses both in armature and rotor windings 8. As load p.f of an alternator becomes more leading, the value of generated voltage required to give rated terminal voltage [ ] A)increases B) remains unchanged C) decreases D) varies with rotor speed 9. The voltage regulation of an alternator having 0.75 leading p.f load, no-load induced emf of 2400V and rated terminal voltage of 3000V is \_\_\_\_\_ percent. Γ 1 A)20 B)-20 C)150 D)-26.7 10. Synchronous impedance method is known as [ ] A)MMF method B)EMF method C)ASA method D)none. 11. Zero power factor method another name is \_\_\_\_\_. [ ] A)Potier method B)MMF method C) EMF method D)ASA method 12. Ampere Turn method is also named as \_\_\_\_\_ Γ ] A)Potier method B)MMF method C)EMF method D)ASA method 13. What are the characteristics required for potier method of computing voltage regulation 1 B)Short circuit characteristic A)Open circuit characteristic C)Zero power factor full load voltage characteristic D)all of the above. 14. Which quantities are usually determined using the zero-power factor characteristics of a synchronous machine? ſ 1 A)leakage reactance drop B)voltage drop due to armature reaction C)armature reaction ampere turns D)all of the above. 15. Which method of regulation is called pessimistic method? Γ 1 A)EMF method B)MMF method

	QUESTION BANK 2016
C) Potier method	D)none
16. The voltage regulation of an alternator having 2400V and rated terminal voltage of 3000V is	0.75 leading p.f. load, no-load induced e.m.f. of []
<ul> <li>A) 20</li> <li>C) 150</li> <li>17. When speed of an alternator is changed from 3 will become</li> </ul>	B) - 20 D) - 26.7 600 r.p.m. to 1800 r.p.m., the generatede.m.f./phases []
A) one-half	B) twice
C) four times	D) one-fourth.
18. The magnitude of the three voltage drops in an reactance and armature reaction is solely dete	alternator due to armature resistance, leakage rmined by []
A) load current, I <sub>a</sub>	B) p.f. of the load
C) whether it is a lagging or leading p.f. loa	D) field construction of the alternator.
<ul><li>19. The short circuit characteristic of an alternator</li><li>A) always linear</li></ul>	is: [] B) always non-linear
C) either (a)and (b)	D) none
20 With a leadingp.f. of load, the effect of armate	are reaction on the main-field flux of an alternator is
A) distortional	B) magnetising
C) demagnetising	D) nominal.
<ul><li>21. Regulation of an alternator supplying resistive</li><li>A) always positive</li></ul>	or inductive load is: [] B) always negative
C) either of the aboveor zero	D) none
22. Regulation of an alternator supplying capacitiv	e load is: [ ]
A) always positive	B) always negative
C) either of the above or zero	D) none
<ul> <li>23. Synchronous reactance of an alternator is due t <ul> <li>(A) leakage flux only</li> <li>(B) reactance because of armature reaction</li> <li>(C) synchronous machine reactance</li> <li>(D) both, leakage fluxas well as armature reaction</li> </ul> </li> </ul>	o: [] in the machine eaction

QUESTION BANK 2016 24 If, in an alternator, chording angle for fundamental flux wave is  $\alpha$ , its value for 5th harmonic is ſ 1 A) 5α B) α/5 C) 25a D) α/25. 25. Voltage regulation of the Alternator is ] [ A) E-V B) (E-V)/V C) V-E D) none **26**. The number of electrical degrees passed through in one revolution of a six pole alternator 1 A)360<sup>±</sup> B)720 C) 1080 D)2160. 28. In which of the following, voltage regulation may be zero or negative ſ 1 A) unity power factor B) leading power factor D) all of the above C) lagging power factor 29. Which of the following voltage regulation method is accurate? [ ] A) Synchronous impedance method B) MMf method C) ZPF method D) American standard association method 30. Voltage regulation can be determined by which of the following? 1 ſ A) Synchronous impedance method. B) MMf method. C) ZPF method. D) All of the above. 31. In an alternator, the voltage regulation will be positive when the P.f of the load is 1 ſ A) Leading B) Unity C) Lagging D) Both (b) & (c) 32. Which method for finding percentage regulation in synchronous machines is called pessimistic method? ſ 1 A) E.M.F. method B) M.M.F. method C) Z.P.F. method D) Direct loading method **33.** The percentage voltage regulation of an alternator is given by [ ] A) { $(E_{ph} - V_{ph}/E_{ph}) * 100$ } B) { $(V_{ph} - E_{ph} / E_{ph})*100$ } C) { $(E_{ph} - V_{ph} / V_{ph})*100$ } D) { $(V_{ph} - E_{ph} / V_{ph})*100$ }

	QUESTION BANK	20	16
34.Short circuit ratio of an alternator is given by	I	[	]
A) If for rated short circuit current / I f for rated sh	nort circuit voltage		
B) If for rated short circuit Voltage / If for rated sh	ort circuit current		
C) If for rated open circuit Voltage / If for rated sh	ort circuit current		
D) If for rated short circuit current / If for rated ope	en circuit voltage		
35. Low value of SCR in an alternator indicates	I	[	]
A) High stability limit	B) Low stability limit		
B) Both	D) None of these		
36.If the value of SCR in an alternator is low then the air g reactance will be	gap and voltage drop across sync	hrono [	ous ]
A) Low, high	B) High, low		
C) Low, low	D) High, high		
37. The direct method for finding the voltage regulation of	an alternator is/are	[	]
A) E.M.F method	B) M.M.F. method		
C) Z.P.F method	D) None of these		
38. For high capacity alternators, which method is not suit	able for finding percentage regul	lation	?
	I	[	]
A) Direct loading method	B) Synchronous impedance me	ethod	
C) Ampere-turns method	D) Potier triangle method		
39. On unity power factor, the terminal voltage of an alternative end of an alternative end of the second s	nator is	[	]
A) Always less than induced emf	B) Always greater than induce	ed emf	
C) Same as induced emf	D) None of these		
40. For synchronization of single phase alternators which	method gives the more accurate	result'	?
	I	[	]
A) Lamps dark method	B) Lamps bright method		
C) Both (a) and (b)	D) None of these		

	QUESTION BANK	2016
UNIT	<u>`-III</u>	
PARALLEL OPERATION OF SY	NCHRONOUS GENERATORS	
1. For proper parallel operation, AC poly-phase alter A)speed	nators must have the same [ B)voltage rating	]
C)kVA rating	D)excitation	
2. In the following conditions, the one which does not is	ot have to be met by alternators workin	g in parallel ]
A) terminal voltage of each machine must be	the same	
B) the machines must have the same phase ro	otation	
C)The machines must operate at the same free	quency	
D)the machines must have equal ratings.		
3. After wiring up two $3-\phi$ alternator, you checked th	eir frequency and voltage and found th	nem to
be equal. Before connecting them in parallel, you	would [	]
A)check turbine speed	B)check phase rotation	
C)Lubricate everything	D)check steam pressure	
4. Some engineers prefer 'lamp bright' synchronizat	ion to 'lamps dark' synchronization be	ecause
	[	]
A) brightness of lamps can be judged easily		
B) it gives sharper and more accurate synchro	onization	
C) flicker is more pronounced		
D) it can be performed quickly		
<ol> <li>It is advisable to connect a stationary alternator to A)is likely to run as synchronous motor</li> </ol>	live bus-bars because is [	]
B)will get short circuited		
C) will decrease bus-bar voltage through me	omentarily	
D) will disturb generated emfs of other alter	rnators connected in parallel	
6. Two identical alternators are running in parallel an	nd carry equal loads. If excitation of or	e
alternator is increased without changing its steam	a supply, then	]
Electrical Machines-III		Page 15

	QUESTION BANK 2016	
A) it will keep supplying almost the same load	B)kVAR supplied by it would decrease	se
C) its p.f will increase	D)kVA supplied by it would decreas	se
7. Keeping its excitation constant, if steam supply of an	alternator running in parallel with another	
identical alternator is increased, then A)it would over-run the other alternator	[ ]	
B)its rotor will fall back in phase with respect to	the other machine	
C)It will supply greater portion of the load		
D)its power factor would be decreased		
8. The load sharing between two steam driven alternato	rs operating in parallel may be adjusted by	
varying the	[ ]	
A)field strengths of the alternators B)	power factors of the alternators	
C)steam supply to their prime movers D)s	speed of the alternators	
9. Squirrel-cage bars placed in the rotor pole faces of ar A)above synchronous speed onlyE	a alternator help reduce hunting [ ] B)below synchronous speed only	
C)above and below synchronous speeds both D)	)none of the above	
10. For a machine on infinite bus active power can be v A)changing field excitation	aried by [ ] B)changing of prime cover speed	
C)By changing frequency	D)none of the above	
11. When two alternators are running in parallel, their F while their kW load share is changed by char	RKVA load share is changed by changing their         nging their	eir
A) excitation, driving torque	B)driving torque, excitation	
C)excitation, excitation	D)driving torque, driving torque.	
12. Two-alternators are running in parallel. If the drivin will result in change is	g force of both the alternators is changed, th	nis
A)frequency	B)back emf	
C)generated voltage	D)all of the above.	
13. A three phase alternator has a phase sequence of RV current is reversed, the phase sequence will become	<i>A</i> B for its three output voltages. In case the f	field
A)RBY	B)RYB	
Electrical Machines-III	Pag	je 16

## QUESTION BANK 2016

C)YRB	D)none of the above.	
14. Two alternators are running in parallel. The excitation result will be	of one of the alternator is increased. The	
A)machine with excess excitation will burn	B)both machines will start vibrating	
C)power output will decrease	D)wattless component will change.	
15. Two alternators A and B are sharing an inductive load increased	equally. If the excitation of alternator A is [ ]	
A)alternator B will deliver more current and alternato	r A will deliver less current	
B)alternator B will deliver less current and alternator	A will deliver more current	
C)both will continue to share load equally		
D)both will deliver more current.		
16. Desirable feature for the parallel operation of two alter	rnators is [ ]	
A)both should have same resistance	B)both should have same reactance	
C)both should have less of resistance as compared	to synchronous reactance	
D)both should have more of resistance as compare	d to synchronous reactance.	
17. If two machines are running in synchronism and the ve	oltage of one machine is suddenly increased	
	[ ]	
A)the machines will burn	B)both machines will stop	
C)synchronising torque will be produced to restore	e further synchronism.	
D) none		
<ul><li>18. Two alternators A and B are sharing a resistive load (p.f. = 1) equally. Now if the excitation of alternator A is increased</li></ul>		
A)alternator A will become lagging and alternator B	will become leading	
B)alternator A will become leading and alternator B w	vill become lagging	
C)both alternators will continue to operate on unity power factor		
D)both alternators will operate on lagging power factor		
19. When two alternators are running in exactly synchroni	sm, the synchronising power wil be[ ]	
A)zero B)sur	n of the output of two	

QUESTION BANK 2016 D)0.707. C)unity 20. Two alternators are connected in parallel. Their kVA and kW load share can be changed by changing respectively their ſ ] A)driving torque and excitation B) excitation and driving torque C) excitations only D)driving torques only. 21. In case of alternators, the dark and bright lamp method is used for Γ 1 A)phase sequence B)load balancing C)synchronizing D)load transfer. 22. For parallel operation, alternators must have ſ ] A)same speed B)same kVA rating C)same voltage rating D)none of the above 23. The speed regulation of a synchronous motor is always A) 1% B) 0.5% C) positive D) zero 24. Two identical alternators are running in parallel and carry equal loads. If excitation of one alternator is increased without changing its steam supply, then 1 Γ B) kVAR supplied by it would decrease A) it will keep supplying almost the same load C) itsp.f. will increase D) kVA supplied by it would decrease **25**. Keeping its excitation constant, if steam supply of an alternator running in parallel with another identical alternator is increased, then 1 A) it would over-run the other alternator B) its rotor will fall back in phase with respect to the other machine C) it will supply greater portion of the load D) its power factor would be decreased. **26**. For eliminating 7th harmonic from the e.m.f. wave of an alternator, the fractional-pitch must be ſ 1 A) 2/3 B) 5/6 C) 7/8 D) 6/7.

## QUESTION BANK 2016

<b>27</b> . The load sharing between two steam-driven alt varying the	ernators operating in parallel may be a	ıdjusted [	l by ]
A) field strengths of the alternators	B) power factors of the alternators		
C) steam supply to their prime movers	D) speed of the alternators.		
28. Squirrel-cage bars placed in the rotor pole face	s of an alternator help reduce hunting	[	]
A) above synchronous speed only	B) below synchronous speed only		
C) above and below synchronous speeds be	D) none of the above.		
<b>29</b> . At leading p.f., the armature flux in an alternate	or the rotor flux.	[	]
A) opposes	B) aids		
C) distorts	D) does not affect.		
<b>30</b> . For a machine on infinite bus active power can	be varied by	[	]
A) changing field excitation	B) changing of prime cover speed		
C) both (a) and (b) above	D) none of the above .		
<b>31</b> . In an alternator, voltage drops occurs in		[	]
A) armature resistance only B) arm	nature resistance and leakage reactance	e	
C) armature resistance, leakage reactance a	nd armature reaction D) none.		
32. For proper parallel operation, a.c. polyphase al	ternators must have the same	[	]
A) speed	B) voltage rating		
C) kVA rating	D) excitation.		
33. Under no-load condition, power drawn by the p	prime mover of an alternator goes to	[	]
(A) produce induced e.m.f. in armature win	ding (B) meet no-load losses		
(C) produce power in the armature (D) m	neet Cu losses both in armature and rot	tor winc	lings.
34. Of the following conditions, the one which doe parallel is	es not have to be met by alternators wo	orking in [	n ]
A) terminal voltage of each machine must l	be the same		
B) the machines must have the same phase	rotation		
C) the machines must operate at the same frequency			
D) the machines must have equal ratings.			

QUESTION BANK 2016

35. Two identical alternators having impedances  $Z_1$  and  $Z_2$  are connected in parallel produces  $E_1$ and  $E_2$  as their induced emf's. if no load is connected to the alternators then a circulating current will flow in the circuit. This current is given by 1 A)  $E_1 + E_2 / Z_1 - Z_2$ B)  $E_1 - E_2 / Z_1 + Z_2$ C)  $E_2 - E_1 / Z_1 + Z_2$ D) $E_1 + E_2 / Z_1 + Z_2$ 36. If a 3 phase alternator is short circuited at its terminal, then the initial value of short circuit current will be limited by ] Γ B) Transient reactance A) Synchronous reactance C)Sub transient reactance D) All of the above 37. The method used to determine  $X_d$  and  $X_q$ , the direct and quadrature axis reactance is called 1 A) Reactance test B) Blondel's two reaction theory C) Slip test D) All of the above 38. Depending upon the reluctances offered along the direct axis and quadrature axis, the armature reaction flux will A) Lead the armature current B) Lags behind the armature current C) In phase with the armature current D) Either (b) or (c) 39. When two alternator are operating in parallel and at perfect synchronization, their synchronizing power will be 1 Γ A) negative. B) infinite. C) positive. D) zero. 40. A load of 110kW at 0.8 power factor is to be shared by two single phase transformer with equal turns have impedances equal to (0.4 + j 0.2) and (0.6 + j 0.8) with respect to secondary. How will they share the load if they are operating in parallel? ſ 1 A) 80kW, 30kW B) 82.55kW, 28.45kW C)75.55kW, 24.45Kw D)85.45kW, 24.55kW

#### UNIT-IV

#### SYNCHRONOUS MOTOR

1. Synchronous motors are generally not self-starting because	[	]
A)the direction of rotation is not fixed		
B)the direction of instantaneous torque reverses after half cycle		
C)startes cannot be used on these machines		

D)starting winding is not provided on the machines

	QUESTION BANK	2016
2. A pony motor is basically a	]	1
A)small induction motor	B)D.C. series motor	1
C)D.C. shunt motor	D)double winding A.C./D.C. motor	
3. A synchronous motor can be started by	_ ,	1
A)pony motor	B)D C compound motor	1
c) providing damper winding	D)any of the above	
4. Under which of the following conditions hu	nting of synchronous motor is likely to occu	ır?
		1
A)Periodic variation of load	B)Over-excitation	
c) Over-loading for long periods	D)Small and constant load	
5. The power developed by a synchronous mot	tor will be maximum when the load angle is	1
A)zero	B)45°	
c) 90°	D)120°	
6 A synchronous motor can be used as a synch	hronous capacitor when it is	1
A)under-loaded	B)over-loaded	. ]
C)under-excited	D)over-excited	
7 Mostly synchronous motors are of	D)over-exerced	1
A)alternator type machines	B) induction type machines	. ]
C)salient pole type machines	D)smooth cylindrical type machines	
8 Synchronous motor always runs at	D)smooth cynnencar type machines	. 1
a. Synchronous motor always fulls at	B) loss than synchronous sna	
(C) more then synchronous speed	D) pope of the showe	icu
C) more than synchronous speed	D) none of the above	1
9. All over-excited synchronous motor takes	D)logging ourment	. ]
A)leading current	D) agging current	
C both A) and $(0)$	D) none of the above	honical
10. If load (or torque) angle of a 4-pole synchro	onous motor is of electrical, its value in met	
	D)2	. ]
A)2	B)S	
		· 1
11. For v-curves for a synchronous motor the	graph is drawn between	. ]
A)field current and armature current	B)terminal voltage and load factor	
C)power factor and field current	D) armature current and power factor	or a
12. The back e.m.t. of a synchronous motor de	ppends on [	. ]
A)speed	B)load	
C)load angle	D)all of the above	
13. A synchronous motor can operate at		. ]
A)lagging power factor only B	b) leading power factor only	
C)unity power factor only D	)lagging, leading and unity power factors	
14. The oscillations in a synchronous motor ca	in be damped out by	
A) maintaining constant excitation		
B) running the motor on leading pow	ver factors	
C)providing damper bars in the rotor po	ole faces	
D)oscillations cannot be damped		
Electrical Machines-III		Page 2

	QUESTION BAN	JK 20	)16
5. When the field of a synchronous motor is under-	excited, the power factor will be	[	]
A)leading	B)lagging	L	1
C)unity	D)zero		
6. The percentage slip in case of a synchronous mot	tor is	ſ	1
A)1%	B)100%	L	L
C)0.5%	D)zero		
7. The rotor copper losses, in a synchronous motor.	are met by	Γ	1
A)d c source	B)armature input	L	L
C)motor input	D)supply lines		
The maximum power developed in a synchronou	s motor occurs at a counling angle of	ofI	1
A)30°	B)60°	) <u>-</u> [	J
C)90°	D)180°		
The speed regulation of a synchronous motor is a	lways	ſ	1
A)1%	B)0 5%	L	1
C)positive	D)zero		
) In which of the following motors the stator and r	otor magnetic field rotate at the sam	e snee	19
. In which of the following motors the stator and fo	stor mugnetie neur rotate at the sam	lo speed I	- · 1
A)Universal motor	B)Synchronous motor	L	J
C) Induction motor	D)Reluctance motor		
Synchronsizingnower of a synchronous machine	is	ſ	1
A) directly proportional to the synchronous res	actance	L	1
B) inversely proportional to the synchronous to	reactance		
C) agual to the synchronous reactance	cactance		
D)none of the above			
2 The standard full-load power factor ratings for s	vnchronous motors are	ſ	1
	B) unity or 0.8 lagging	L	1
C)unity or 0.8 leading	D)unity or zero		
3 A synchronous motor working at leading power t	factor can be used as	Г	1
A) voltage booster	B) phase advancer	L	1
C) poise generator	D) phase advancer		
4. The efficiency of a properly designed synchronol	b) meenamear synchronizer	ſ	1
+. The efficiency of a property designed synchronom $\Delta (60 \text{ to } 70\%)$	$\frac{1}{10000} = \frac{1}{10000} = \frac{1}{10000000000000000000000000000000000$	L	]
C) 85 to 0.5%	$D(0) = t_0 = 00.5\%$		
C)05 10 95 %	D)99 to 99.3%	г	1
5. To minit the operating temperature an electrical in	B) our mont rating	l	]
A)voltage factor	D)speed		
C)power factor	D)speed	г	1
b. The angle between the rotating stator flux and ro	Disktuss	L	]
A)torque	B)odiuse		
C)synchronizing	D)power factor	• .1 .	
An important advantage of a synchronous motor	over wound round induction motor	1s that	ı
A) its power factor may be and it at an it		L	]
A) its power factor may be varied at will D) its speed is independent of the local			
B)its speed is independent of supply frequence	cy		
Chis speed may be controlled more easily			
lectrical Machines-III			Page

	QUESTION BAN	К	2016
D)none of the above			
28. The speed of a synchronous motor		[	]
A)increases as the load increases	B)decreases as the load decreases		
C)always remains constant	D)none of the above		
29. Due to which of the following reasons a synchr	onous motor fails to pull into synchron	nisn	n after
applying D.C. field current ?		[	]
A) High field current	B) Low short circuit ratio		
C)High core losses	D)Low field current		
30. In a synchronous motor, the maximum power d	eveloped depends on all of the follow	ing	except
		[	]
A)rotor excitation	B)maximum value of coupling angle		
C)direction of rotation	D)supply voltage	-	-
31. In a synchronous motor, damper windings are p	provided on	L	]
A)stator frame	B)rotor shaft		
C)pole faces	D)none of the above	г	1
32. The induced e.m.r. in a synchronous motor wor	Ring on leading power factor will be	L	]
C) aqual to the supply voltage	D)none of the should		
23 The net armsture voltage of a synchronous mot	D)hole of the above	г	1
A)voctor sum of Eb and V	B) arithmatic sum of Eh and V	L	J
C) arithmetic difference of Eb and V	D)vector difference of Eph and V		
34 The ratio of starting torque to running torque in	a synchronous motor is	Г	1
A)zero	B)one	L	J
C)two	D)infinity		
35. The magnitude of field flux in a 3-phase synchr	conous motor	Г	1
A) remains constant at all loads	B) varies with speed	L	
C)varies with the load	D)varies with power factor		
36. Hunting in a synchronous motor cannot be due	to	[	]
A)windage friction	B)variable load		
C)variable frequency	D)variable supply voltage		
37. In a 3-phase, 4-pole, 50 Hz synchronous motor,	the frequency, pole number and load	tore	jue all are
halved. The motor speed will be		[	]
A) 3000 r.p.m.	B) 1500 r.p.m.		
C)750 r.p.m.	D)none of the above		
38. In a synchronous motor, the damping winding i	s generally used to	[	]
A)prevent hunting and provide the starting	torque B)reduce the eddy currents		
C)provide starting torque only	D)reduce noise level		
39. If the field of a synchronous motor is under exc	ited, the power factor will be	[	]
A) zero	B) unity		
C) lagging	D) leading		
40. For power factor correction, synchronous motor	rs operate at	[	]
Electrical Machines-III			Page 23

	QUESTION BANK 2016
A) no-load and greatly over-excited fields	B )no-load and under-excited fields
C) normal load with minimum excitation	D) normal load with zero excitation

### UNIT-V

#### SINGLE PHASE AND SPECIAL MOTORS

1. In a split phase motor, the running winding should have

A)high resistance and low inductance

B)low resistance and high inductance

Electrical Machines-III

]

[

QUESTION BANK 2016 C) high resistance as well as high inductance D)low resistance as well as low inductiance 2. In a capacitor start and run motors the function of the running capacitor in series with the auxiliary winding is to [ ] A)improve power factor B)increase overload capacity C)reduce fluctuations in torque D)to improve torque 3. In a capacitor start motor, the phase displacement between starting and running winding can be nearly ſ 1 A) 10° B)30° C)60° D)90° 4. Which of the following motor will give relatively high starting torque ? ſ 1 A)Capacitor start motor B)Capacitor run motor C)Split phase motor D)Shaded pole motor 5. In a shaded pole single-phase motor, the revolving field is produced by the use of ſ 1 A)inductor B)capacitor C)resistor D)shading coils 6. A centrifugal switch is used to dis- connect 'starting winding when motor has ſ 1 A) run for about 1 minute B) run for about 5 minutes C)picked up about 50 to 70 per cent of rated speed D)picked up about 10 to 25 per cent of rated speed 7. If a particular application needs high speed and high starting torque, then which of the following motor will be preferred ? [ ] A) Universal motor Shaded pole type motor B) C)Capacitor start motor D)Capacitor start and run motor 8. The value of starting capacitor of a fractional horse power motor will be [ ] A)100 uF B) 200 uF

	QUESTION BANK	2016
C)300 uF	D)400 uF	
9. In a single phase motor the centrifugal switch	I	]
A) disconnects auxiliary winding of the mo	tor B) disconnects main winding of	of the motor
C)reconnects the main winding the motor	D)reconnects the auxiliary winding	of the motor
10. Which of the following motors is used in mixie	es ?	]
A)Repulsion motor	B)Reluctance motor	
C)Hysteresis motor	D)Universal motor	
11. Which of the following motors is inherently sel	If starting ?	]
A)Split motor	B)Shaded-pole motor	
C)Reluctance motor	D) None of these	
12. Direction of rotation of a split phase motor can A)running winding only	be reversed by reversing the connection B)starting winding only	ι[ ] γ
C)either A)or (b)	D)both A)and (b)	
13. In a capacitor start single-phase motor, when ca	apacitor is replaced by a resistance	]
A)torque will increase	B)the motor will consume less power	
C)motor will run in reverse direction	D)motor will continue to run in same	direction
14. The power factor of a single-phase induction m	otor is usually	]
A) lagging	B) always leading	
C)unity	D)unity to 0.8 leading	
15. A shaded pole motor can be used for	I	]
A)toys	B)hair dryers	
C)circulators	D)any of the above	
16. A hysteresis motor works on the principle of	I	]
A) hysteresis loss	B) magnetisation of rotor	
C)eddy current loss	D)electromagnetic induction	
17. For which of the applications a reluctance moto	or is preferred ?	]
A) Electric shavers	B) Refrigerators	

	QUESTION BA	NK	2016
C)Signalling and timing devices	D)Lifts and hoists		
18. Which of the following motors is preferred for tape-rea	corders ?	[	]
A)Shaded pole motor	B)Hysteresis motor		
C)Two value capacitor motor	D)Universal motor		
19. A universal motor can run on		[	]
A) A.C. only	B) D.C. only		
C)either A.C. or D.C.	D)none of the above		
20. Which of the following single-phase motors is suitable	e for timing and control purpo	oses[	]
A) Reluctance motor	B) Series motor		
C)Repulsion motor	D)Universal motor		
21. Which of the following motors will operate at high po-	wer factor ?	[	]
A) Shaped pole motor	B)Split phase motor		
C)Capacitor start motor	D)Capacitor run motor		
22. In A.C. series motor compensating winding is employed	ed to	[	]
A)reduce the effects of armature reaction	B)increase the torque		
C)reduce sparking at the brushes	D)none of the above		
23. In case of a shaded pole motor the direction of rotation	of the motor is	[	]
A) from main pole to shaded pole			
B)from shaded pole to main pole			
C)either of the above depending on voltage			
D)either of the above depending on power factor			
24. The direction of rotation of universal motor can be rev	ersed the by reversing the flo	w of a	current
Through		[	]
A)armature winding	B)field winding		
C)either armature winding or field winding	D)none of the above		
25. Which motor is normally free from mechanical and ma	agnetic vibrations	[	]
A)Split phase motor	B)Universal motor		
Electrical Machines-III			Page 27

QUESTION BANK 2016 D)Shaded pole motor C)Hysteresis motor 26. As hysteresis motors are free from mechanical and magnetic vibrations therefore these are considered as suitable for ] [ A)fans B)blowers D)mixer grinders C)sound equipment 27. The electric motor used in portable drills is [ ] A)capacitor run motor B)hysteresis motor C)universal motor D)repulsion motor 28. Torque developed by a single phase induction motor at starting is ſ ] B) uniform A) pulsating C)none of the above D)nil 29. The shaded pole motor is used for ſ ] A)high starting torque B)low starting torque C)medium starting torque D)very high starting torque 30. The speed/load characteristics of a universal motor is same as that of ſ ] A) A.C. motor B) D.C. shunt motor C)D.C. series motor D)none of the above 31. Which of the following motors is used for unity power factor ? ſ ] A) Hysteresis motor B) Schrage motor C)Universal motor D)Reluctance motor 32. The motor used for the compressors is 1 A)d.c. series motor B)shaded pole motor C)capacitor-start capacitor-run motor D)reluctance motor 33. Centrifugal switch disconnects the auxiliary winding of the motor at about \_\_\_\_\_ percent of synchronous speed [ 1 A)30 to 40 B)70 to 80 C)80 to 90 D)100

QUESTION BANK 2016 34. Starting winding of a single phase motor of a refrigerator is disconnected from the circuit by means of a 1 ſ A)magnetic relay B)thermal relay C)centrifugal switch D)none of the above 35. If starting winding of a single-phase induction motor is left in the circuit, it will [ ] A)run faster B)spark at light loads C)draw excessive current and overheat D)run slower 36. A shaded pole motor does not possess ſ ] A)centrifugal switch B)capacitor C)commutator D)all of the above 37. A repulsion motor is equipped with [ ] slip rings B) commutator A) C)both A)and (b) D)none of the above 38. If a D.C. series motor is operated on A.C. supply, it will Γ ] B) have poor efficiency A) spark excessively D)all of the above C)have poor power factor 39. The starting winding of a single-phase motor is placed in ſ 1 A)armature B)field C)rotor D)stator 40. The speed of a universal motor is usually reduced by using Γ 1 B)belts A)gearing C)brakes D)chains

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