University of Mumbai
Examination 2020

Program: First Year Engineering
Curriculum Scheme: Rev2016
Examination: First Year Semester I
Course Code: FEC105 and Course Name: Basic Electrical Engineering
Time: 1 hour Max. Marks: 50

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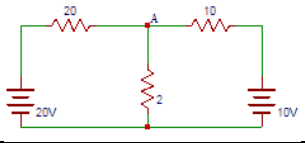
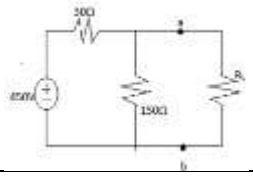
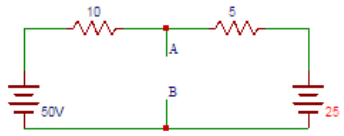
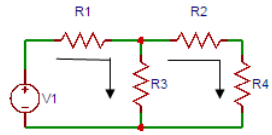
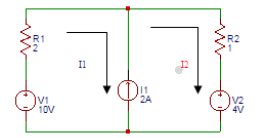
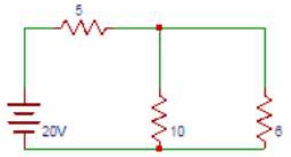
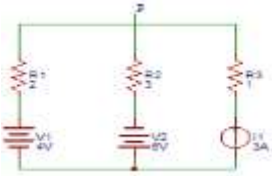
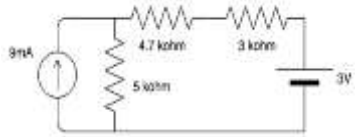
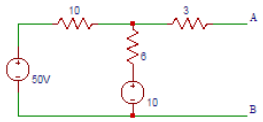
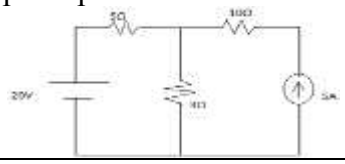
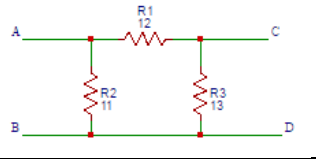
For the students:- All the Questions are compulsory and carry equal marks .

Q1.	Find the voltage across 2Ω resistor due to 20V source in the circuit shown below 
Option A:	1V
Option B:	1.5V
Option C:	2V
Option D:	2.5V
Q2.	What is the correct expression for the RMS value of current?
Option A:	$I_{rms}=I_m/2$
Option B:	$I_{rms}=I_m/\sqrt{2}$
Option C:	$I_{rms}=I_m/4$
Option D:	$I_{rms}=I_m$
Q3.	In a balanced three-phase system-delta load, if we assume the line voltage is $V_{RY} = V\angle 0^0$ as a reference phasor. Then the source voltage V_{YB} is?
Option A:	$V\angle 0^0$
Option B:	$V\angle -120^0$
Option C:	$V\angle 120^0$
Option D:	$V\angle 240^0$
Q4.	The full-load copper loss of a transformer is 1600 W. At half-load, what will be the copper loss?
Option A:	6400 W
Option B:	1600 W
Option C:	800 W
Option D:	400 W
Q5.	Calculate the maximum power delivered across R_L of the circuit given. 
Option A:	900W
Option B:	1025W
Option C:	2025W
Option D:	1500W

Q6.	Determine the equivalent Thevenin's voltage between terminals A and B in the circuit shown below 
Option A:	0.333V
Option B:	3.33V
Option C:	33.3V
Option D:	333V
Q7.	If the phasors are drawn to represent the maximum values instead of the RMS values, what would happen to the phase angle between quantities?
Option A:	Increases
Option B:	Decreases
Option C:	Remains constant
Option D:	Becomes zero
Q8.	In the figure shown below, the current through loop 1 be I_1 and through the loop 2 be I_2, then the current flowing through the resistor R_3 will be? 
Option A:	I_1
Option B:	I_2
Option C:	I_1-I_2
Option D:	I_1+I_2
Q9.	Consider the circuit shown below. Find the current I_1 (A). 
Option A:	1
Option B:	1.33
Option C:	1.66
Option D:	2
Q10.	A three phase, balanced delta connected load of (4+j8) Ω is connected across a 400V, 3Φ balanced supply. Determine the phase current I_R. Assume the phase sequence to be R_{YB}.
Option A:	$44.74\angle -63.4^0$ A
Option B:	$44.74\angle 63.4^0$ A
Option C:	$45.74\angle -63.4^0$ A
Option D:	$45.74\angle 63.4^0$ A

Q11.	Find the voltage drop across 6Ω resistor in the circuit below, using Norton's Theorem 
Option A:	6.58V
Option B:	7.58V
Option C:	8.58V
Option D:	9.58V
Q12.	Find the voltage at node P in the figure shown. 
Option A:	8V
Option B:	9V
Option C:	10V
Option D:	11V
Q13.	If two current phasors, having magnitude 5A and 10A intersect at an angle of 60 degrees, calculate the resultant current.
Option A:	12.23A
Option B:	12.54A
Option C:	13.23A
Option D:	14.24A
Q14.	Calculate the total current in the circuit using source transformation 
Option A:	2.3mA
Option B:	4.3mA
Option C:	3.3mA
Option D:	1.3mA
Q15.	Determine the equivalent Thevenin's voltage between terminals A and B in the circuit shown below. 
Option A:	5
Option B:	15
Option C:	25
Option D:	35

Q16.	Which of the following is the example to describe the efficiency of power transfer?
Option A:	Communication systems
Option B:	Power utility systems
Option C:	Instrumentation systems
Option D:	Telecom systems
Q17.	A resistance of 7Ω is connected in series with an inductance of 31.8mH. The circuit is connected to a 100V, 50Hz sinusoidal supply. Calculate the phase difference.
Option A:	-55.1
Option B:	55.1
Option C:	66.1
Option D:	-66.1
Q18.	If a resistor R_x is connected between nodes X and Y, R_y between X and Y, R_z between Y and Z to form a delta connection, then after transformation to star, the resistor at node X is?
Option A:	$R_xR_y/(R_x+R_y+R_z)$
Option B:	$R_xR_z/(R_x+R_y+R_z)$
Option C:	$R_zR_y/(R_x+R_y+R_z)$
Option D:	$(R_x+R_y)/(R_x+R_y+R_z)$
Q19.	Find the equivalent resistance between node 1 and node 3 in the star connected circuit shown below 
Option A:	30Ω
Option B:	31Ω
Option C:	32Ω
Option D:	33Ω
Q20.	A single phase transformer has specifications as 250 KVA, 11000V/415V, 50 Hz. What are the values of primary and secondary currents?
Option A:	Primary current = 602.4A, Secondary current = 22.7A
Option B:	Secondary current = 202.7A, Primary current = 602.4A
Option C:	Primary current = 22.7A, Secondary current = 602.4A
Option D:	Primary current = 11.35A, Secondary current = 301.2A
Q21.	Find the current in the 3Ω resistor of the given network using Superposition principle. 
Option A:	2.5A

Option B:	3.125A
Option C:	6.525A
Option D:	5.625A
Q22.	For a transformer given of 100 kVA, 220V/6000V transformer, short circuit test is performed. What current rating is needed?
Option A:	30A
Option B:	445A
Option C:	60A
Option D:	55A
Q23.	The three impedances $Z_1 = 20\angle 30^0\ \Omega$, $Z_2 = 40\angle 60^0\ \Omega$, $Z_3 = 10\angle -90^0\ \Omega$ are delta-connected to a 400V, 3Φ system. Determine the phase current I_Y
Option A:	(10-j0) A
Option B:	(10+j0) A
Option C:	(-10+j0) A
Option D:	(-10-j0) A
Q24.	Find the equivalent resistance at node A in the delta connected circuit shown in the figure below. 
Option A:	1Ω
Option B:	2Ω
Option C:	3Ω
Option D:	4Ω
Q25.	The input power to a three-phase load is 10kW at 0.8 Pf. Two watt meters are connected to measure the power. Find the reading of higher reading wattmeter.
Option A:	7.165
Option B:	6.165
Option C:	6.165
Option D:	4.165