Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2019-20
EXM/P/09/00

B. Sc-II | **School of Science**

PHS209 | **Skill Enhancement Course** | **Odd**

(Electrical Circuits and Networking Skills) | **Sem III**

Wednesday 27 Nov 2019 **Examination: ESE, Max Marks: 20, Time 30 minutes** 10.30am to 11am

Section-A

Seat No.: **PRN No.:** **Student Sign:**

Invigilator Sign: **Examiner Sign:** **Marks Obtained:**

Instructions:

1) All Questions are compulsory.
2) Mark √ to the correct option. Do not circle.
3) More than one options marked will not be considered for assessment.
4) Rough calculations on paper are not allowed.
5) Use non-programmable calculator is allowed.

Q.1	**Select the correct alternative**	**Marks**	**BL**	**CO**
1	According to Ohm's law, voltage drop across resistor is _____ to the current	01	1	CO1
a)	directly proportional	b)	inversely proportional	
2	emf of the battery is 12V. If it has finite internal resistance then voltage recorded across it is_____	01	2	CO1
a)	less than 12 V	b)	equal to 12 V	
c)	greater than 12 V	d)	zero	
3	Two resistors 10 Ω and 12 Ω are connected in parallel, find equivalent resistance.	01	2	CO1
a)	$R_{eq} = 22\ \Omega$	b)	$R_{eq} = 1.1\ \Omega$	
c)	$R_{eq} = 2\ \Omega$	d)	$R_{eq} = 5.45\ \Omega$	
4	The product of voltage, current and sine angle is called as _____	01	1	CO1
a)	Active power	b)	Reactive power	
c)	Apparent Power	d)	Power	
5	For alternating current, V_{rms} is given by; V_{rms} = _____	01	1	CO1
a)	$0.238\ V_{max}$	b)	$0.638\ V_{max}$	

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c) $0.707\ V_{max}$ d) $0.868\ V_{max}$

6 Power factor is defined as $Cos\phi =$ _____ 01 1 CO1

a) $\frac{\text{Active power}}{\text{Reactive Power}}$ b) $\frac{\text{Active power}}{\text{Apparent Power}}$

c) $\frac{\text{Reactive power}}{\text{Apparent Power}}$ d) $\frac{\text{Reactive power}}{\text{Active Power}}$

7 Following phenomenon is used in transformers _____ 01 1 CO2

a) Induction b) Self induction

c) Mutual induction d) Transformation

8 AC or DC generators work with the principle of _____ 01 1 CO2

a) Gauss law b) Faradays law of induction

c) Ampere's law d) Newton's law

9 When two resistors are connected parallel to each other, ____across it remains same. 01 1 CO2

a) current b) voltage

c) energy d) power

10 Inductive reactance is given by; $X_L =$ _____, Where, f is frequency of source and L is inductance 01 1 CO2

a) $2\Pi fL$ b) $4\Pi fL$

c) $6\Pi fL$ d) $8\Pi fL$

11 The core of transformer is made up of _____ 01 1 CO2

a) Iron b) Nickel

c) Cobalt d) Copper

12 The machine that converts mechanical energy into DC electrical energy is called as _____ 01 1 CO2

a) DC motor b) AC motor

c) DC generator d) AC generator

13 The relation between number of turns of primary windings (N_1) and secondary windings (N_2) and primary coil voltage (V_1) and secondary coil voltage (V_2) is given by _____ 01 1 CO2

a) $\frac{V_2}{V_1} = \frac{N_2}{N_1}$ b) $\frac{V_1}{V_2} = \frac{N_2}{N_1}$

c) $V_1V_2 = \frac{N_1}{N_2}$ d) $\frac{V_2}{V_1} = N_1N_2$

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14	Fuse element is made up of the material having _____	01	1	CO3
	a) low melting point, low conductivity b) low melting point, high conductivity c) high melting point, low conductivity d) high melting point, high conductivity			
15	In order to protect the cable from moisture, gases or other damaging liquids (acids or alkalis) in the soil and atmosphere, a metallic sheath of ____ is used	01	1	CO3
	a) aluminum b) iron c) cobalt d) nickel			
16	Which of the following cable provide good temperature tolerance_____	01	1	CO3
	a) Vulcanized rubber b) Polychloropene PCP c) XLPE Cables d) Polyvinyl chloride (PVC)			
17	The insulation used in cables is made up of _____	01	1	CO3
	a) Copper b) Aluminum c) Iron d) Rubber mineral compound			
18	Resistance across short circuit is _____	01	1	CO3
	a) Zero b) Infinite c) Half the earlier value d) Double the earlier value			
19	The _____ cables interferes the communication system	01	1	CO3
	a) Overhead b) Underground			
20	Which of the following element has the highest conductivity?	01	1	CO3
	a) Copper b) Aluminum c) Cobalt d) Nickel			

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Wednesday 27 Nov 2019

(Electrical Circuits and Networking Skills)

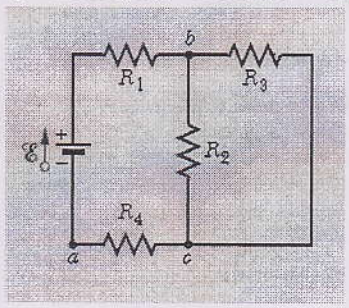
Examination: ESE, Max Marks: 80, Time 2.30 hr 11am to 1.30 pm

Section-B.

Instructions:

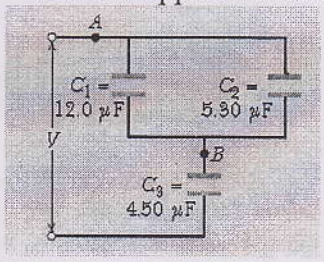
1) All Questions are compulsory.
2) Rough calculations on paper are not allowed.
3) Use non-programmable calculator is allowed.

Q.2	**Answer the following questions**	**Marks (24)**	**BL**	**CO1**
a)	Figure shows a multiloop circuit containing one ideal battery and four resistances with the following values: $R_1 = 20\ \Omega$, $R_2 = 20\ \Omega$, $\mathcal{E} = 12$ V, $R_3 = 30\ \Omega$ and $R_4 = 8\ \Omega$	8	3	



(a) What is the current through the battery?
(b) What is the current i_2 through R_2?
(c) What is the current i_3 through R_3?

b)	What is AC? What is power factor? Explain types of power in an AC circuit.	8	3	
c)	Find the equivalent capacitance for the combination of capacitances shown in Figure across which potential difference V = 12.5 Vis applied. Find charge across the equivalent capacitance.	4	4	



OR

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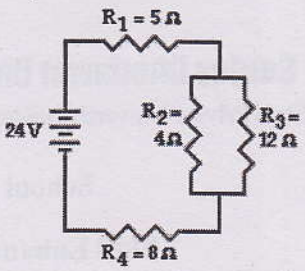
c)	Find voltage and current across resistors R_2 and R_3. 	4	4	
d)	What is inducatance, capacitance, inductive reactance and capacitive reactance?	4	3	
	OR			
d)	State Ohm's law. Discuss I-V characteristics of a resistor using a suitable circuit.	4	3	
Q.3	**Answer the following questions**	**Marks (28)**	**BL**	**CO2**
a)	Discuss principle, construction and working of AC generator. Mention few applications of AC genetors.	12	3	
b)	Elaborate designs of AC and DC sources to control motors.	8	2	
	OR			
b)	What is transformer? Discuss its principle and construction.	8	2	
c)	What are types of transformer? Explain.	4	2	
d)	Differentiate between AC and DC motors.	4	1	
	OR			
d)	Write note on speed and power of ac motor	4	1	
Q.4	**Answer the following questions**	**Marks (28)**	**BL**	**CO3**
a)	Discuss construction of cables used for transmission. Write comparison between aluminum and copper conductors.	12	2	
b)	Explain in detail the over current protection devices.	8	2	
	OR			
b)	Discuss different cable faults.	8	2	
c)	Using proper diagram write construction of cables.	4	2	
d)	What are different types of cables?	4	1	
	OR			
d)	Write properties of cable insulators.	4	1	

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