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Total No. of Questions : 6]

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B.Tech. IInd Semester (CSE, IT & Elect.) Examination, 2022

Basic Electronics Engineering

Paper - BE-202

Time : 3 Hours]

[Maximum Marks : 60

Note :- Attempt all questions. Use of scientific calaulator is required.

1. Choose the correct answers- 10

   (i) The formfactor for a 220V, 50Hz AC waveform is-

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(a)   1.5

(b)   1.14

(c)   1.11

(d)   0.85

(ii)   Wattless current is possible only in-

(a)   Resistive circuit

(b)   Non-resistive circuit

(c)   LR-ciruit

(d)   LCR circuit

(iii)   The unit of flux density is-

(a)   Weber/mt^2

(b)   Henry/mt^2

(c)   Newton/mt^2

(d)   Ampere/mt^2

(iv)   The principle of dc generator is based on -

(a)   self induced emf

(b)   dynamically induced emf

(c)   mutually induced emf

(d)   all of the above

(v)   A transformer has negative voltage regulation when its load powerfactor is-

(a)   zero

(b)   leading

(c)   lagging

(d)   unity

(vi)   The difference between the synchronous speed and the actual speed of an induction motor is-

(a)   regulation

(b)   back lash

(e) slip

(d) lag

(vii) Th Slip in actual induction motor is generally-

(a) 1%

(b) 3 to 5%

(c) 10 to 12%

(d) 15%

(viii) Super position theorem is applicable to-

(a) power only

(b) cursent only

(c) voltage only

(d) carrent and voltage both

(ix) For three phase star connented circuit-

(a) $V_L = V_{ph}$

(b) $I_L = I_{ph}$

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(4)

(c) $I_L = \sqrt{3} I_{ph}$

(d) None of the above

(x) Which of the following is not a part of a squirred cage enduction moter?

(a) Rotor

(b) Stator

(c) Corbon baishes

(d) shaft

2. (a) What do you understand by the term distributed energg resources. What are the advantages associated with them?
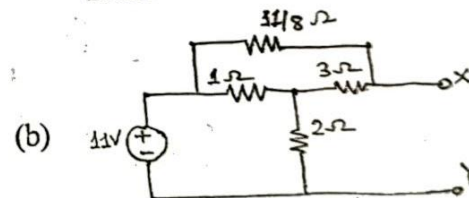
5

Fig 1

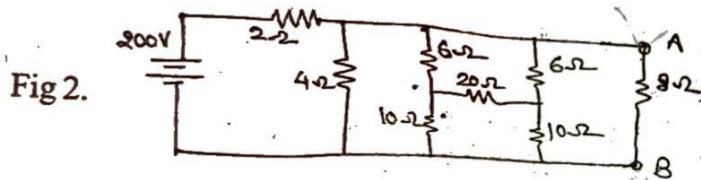In the fig1, find the thevenin equivalent of the circuit cross xy.

5

OR

(a) Explain Electric Power System. With the help of single line diagram show all the components with their voltage level on it.

5

(b) Using Norton's theorem and star-delta transformation, find current I_N through 8Ω resistance, in fig 2.

5

Fig 2.

3. (a) A balanced delta connected load of $(16+j12)$ Ω/phase is connected to a three phase, 230v supply. Find the line current, power factor, reactive VA and total VA.

5

(b) An RLC series circuit consists of a resistance of 1000Ω, an inductance of 100 mH and a capacitance of 10 pico

Farad. If a voltage of 100v is applied across the combination. Find (i) the resonance frequency (ii) Q-factor (iii) the half power points.

OR

(a) How many methods are available to solve parallel ac circuit? Explain any one of them.

5

(b) An alternating voltage of $v = 100 \sin 376.8\, t$ is applied to a circuit consisting of a coil having a resistance of 6Ω and one inductance of 21.22 mH.

5

(i) Express the current flowing in the circuit in the form $i = I_m \sin(376.8 \pm \phi)$

(ii) If a voltmeter, a wattmeter and a frequency meter are connected in the circuit, what would be the readings on the instruments ?

(7)

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4. (a) A single phase, 250/500 v transformer gave following results. 5

Open circuit test : 250v, 1A, 80W on LV side

Short circuit test : 20v, 12A, 100W on HV side

Calculate and draw equivalent circuit parameters.

(b) Distinguish between statically induced emf and dynamically induced emf. 5

OR

(a) Two coils have a mutual inductance of 0.6H. If current in one coil is varied from 4A to 1A in 0.2 Seconds, Calculate average emf induced in other coil and change of fluxe linking with other coil assuming it is wound with 150 tun's. 5

(b) What is transformer ? Derive the emf equation of a trans former. 5

5. (a) Derive the equation for torque developed in a dc motor. 5

(b) Describe different lypes of dc generators, with their appropriate circuit diagrams and equations. 5

OR

(a) Explain the principle of operation of a 3-phase induction motor. What is slip? Define the equations for rotor frequency. 5

(b) A 3 phase, 6 pole star connected alternator revolves at 1000 rpm. The stator has 90 slots and 8 conductors per slot. The flux per pole is 0.05 wb. Calculate the

voltage generated/phase by the machine if winding

factor is 0.96.   5

6. (a) Give the classification of insulators based on voltage

rating. Explain pin type insulator.   5

(b) Write a short note on symmetrical and unsymmetrical

faults.   5

OR

(a) How does microgrid deal with uncertain power generation

by wind or solar system?   5

(b) What is smart gred? What are the key components of a

smart grid?   5

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