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## OLE-3237

### B. Tech. 5th Semester (EE) Examination – April, 2021

**POWER SYSTEMS - I**

**Paper : PCC-EE-301-G**

*Time : Three Hours ]*

*[ Maximum Marks : 75*

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*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

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*Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.*

1. (a) Define the term RRRV.
- (b) What is the application of Per Unit system in power system ?
- (c) What is the importance of symmetrical component in fault calculation ?

- (d) Compare AC and DC transmission systems in brief.
- (e) Explain Ferranti effect in details.  $5 \times 3 = 15$

### UNIT – I

2. What is the difference between one line impedance diagram and reactance diagram ? Explain with a suitable example. 15
3. (a) Express the per unit admittance of a power system in terms of base voltage and base voltampere. 7.5
- (b) Derive the expression for complex power in a single phase load. 7.5

### UNIT – II

4. Determine the symmetrical components of three voltages given below : 15
- $V_a = 200 \angle 0^\circ$ ,  $V_b = 200 \angle 245^\circ$  and  $V_c = 200 \angle 105^\circ$  V
5. Distinguish between symmetrical and unsymmetrical faults. Explain LL-G fault in detail with derivation. 15

### UNIT – III

6. What are the different type of circuit breaker when the arc quenching medium is the criterion ? Explain one of them in details. 15
7. Explain differential protection scheme in details. 15

## UNIT – IV

8. What are the major components of HVDC transmission system ? Explain them in details. 15
9. (a) Draw and explain I-V and P-Y characteristics of PV panels. 7.5
- (b) Explain wind energy generation systems. 7.5
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## OLE-3238

### B. Tech. 5th Semester (EE) Examination – April, 2021

#### CONTROL SYSTEM

Paper : PCC-EE-305-G

*Time : Three Hours ]*

*[ Maximum Marks : 75*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

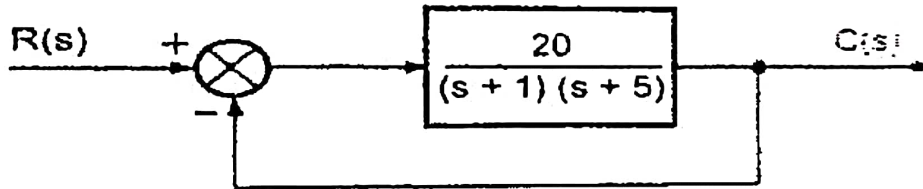
*Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.*

1. (a) Differentiate between open loop and close loop control system.
- (b) Explain brief about Gain and Phase Margin in Bode plot of control system.
- (c) What do you mean by analog controller in control system ?
- (d) Explain concept of state variable in state space analysis.

15

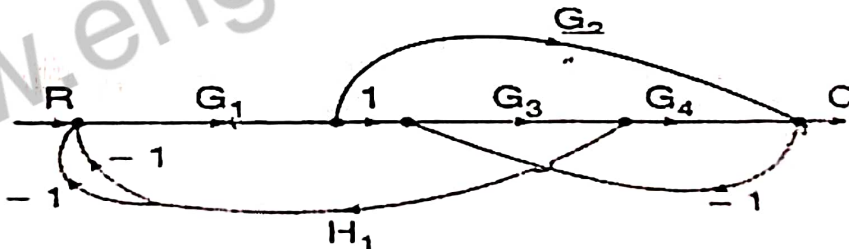
## UNIT – I

2. The block diagram of unity feedback control system is given in figure below : 15

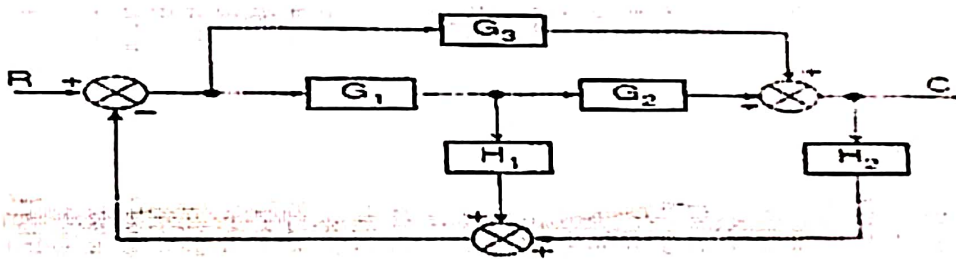


Determine the characteristic equation of the system  $\omega_n$ ,  $\xi$ ,  $\omega_d$ ,  $t_p$ ,  $M_p$ , the time at which the first overshoot occur the period of oscillation and the number of cycles completed before reaching the steady state.

3. (a) Draw the signal flow graph and determine the overall transfer function the signal flow graph is given below. 7.5



- (b) The block diagram of control system is shown below determine the overall transfer function. 7.5



## UNIT – II

4. Sketch the Bode plot for the open loop transfer function of unity feedback system given below and assess stability. 15

$$G(s) = 50 s / (s + 1) (s + 2)$$

5. Using Nyquist Criteria investigate the closed-loop stability of the system whose open loop transfer function is given below : 15

$$G(s)H(s) = K(s + 1) / (s + 0.5) (s - 2), K = 1.25$$

Also determine the limiting value of k for stability.

## UNIT – III

6. Write short note on : 15
- (a) Lag Compensation
  - (b) Lead Compensation
7. Explain PID Controller with its effect on steady state error. 15

## UNIT – IV

8. Write short note on : 15
- (a) Controllability
  - (b) Eigenvalues

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9. Write short note on : 15
- (a) Observeability
  - (b) State space model

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## OLE-3240

**B. Tech. 5th Semester (EE)**

**Examination – April, 2021**

**COMPUTER AIDED ELECTRICAL MACHINE DESIGN**

**Paper : PCC-EE-313-G**

*Time : Three Hours ]*

*[ Maximum Marks : 75*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note : Attempt five questions in all, selecting one question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.*

1. (a) What is magnetic loading ? 3
- (b) Deduce an expression for output equation of d.c. machine. 3
- (c) Compare leakage flux and leakage reactance ? 3
- (d) What do you mean by term optimization in electrical machine design ? 3
- (e) What do you mean by winding factor in an electrical machine ? 3

## UNIT – I

2. Develop an output equation of a.c. machine and discuss various factors affecting size of rotating machine. 15
3. (a) Derive an expression for relation between rating and main dimension of rotating machine. 7.5  
(b) A 350 KW. 500V. 450 r.p.m .. 6 pole dc generator is built with an armature diameter of 0.87m and a core length of 0.32m. The lap wound armature has 660 conductors. Calculate the specific electric and magnetic loading. 7.5

## UNIT – II

4. Describe the stator design of an induction motor in details. 15
5. In the design of 30hp. 3-phase, 440 volt. 960rpm. 50 hz, delta connected induction motor, assume the specific electrical loading of 25000 ac/m. specific magnetic loading of 0.46wb/m<sup>2</sup>. Full load efficiency 86%, pf 0.87 and estimate the following (i) stator core dimension (ii) number of stator slots and winding turns. 15

## UNIT – III

6. (a) Derive an output equation for 1-phase and 3-phase transformer. 7.5  
(b) Describe the detailed design procedure for yoke and core design of a transformer. 7.5



7. (a) Discuss the design of stator slot and winding of a synchronous machine. 7.5
- (b) Discuss the magnetic circuit and field winding of a synchronous machine. 7.5

#### UNIT – IV

8. (a) Enlist the advantages of CAD for machine design along with its limitations. 7.5
- (b) Discuss computerization of design procedure for a d.c. motor. 7.5
9. Write short note on : 15
- (a) Optimization technique for machine design
- (b) Discuss analysis and synthesis method in brief
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## OLE-3239

### B. Tech. 5th Semester (EE) Examination – April, 2021

#### MICRO PROCESSOR & MICROCONTROLLER

Paper : PCC-EE-309-G

*Time : Three Hours ]*

*[ Maximum Marks : 75*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note :* Students have to attempt *five* questions in total, *first* being *compulsory* and selecting *one* from each Section.

1. (a) Define Bus Interface Unit.
- (b) What are advantages of Memory segmentation ?
- (c) Why is the 8284 A clock generator used with 8086  $\mu\text{C}$  ?
- (d) What is a bus cycle ?
- (e) Write conditions to start the timer 8253.
- (f) What are functions of handshake signals ?

- (g) Differentiate microprocessor and microcontroller.
- (h) Write various interrupts in microcontrollers.
- (i) Name items that have inbuilt microcontroller.
- (j) Name *two* ways to speed up digital computers.

$$1.5 \times 10 = 15$$

### SECTION – A

- 2. (a) Describe the 8086 internal architecture in detail. 7.5
- (b) Explain difference between linear addressing and segmented memory addressing. 7.5
- 3. (a) Discuss the difference between minimum mode and maximum mode operation. 7.5
- (b) What is assembly language and what are its advantages? 7.5

### SECTION – B

- 4. (a) List the operating modes of 8255 A programmable peripheral interface. 7.5
- (b) Write about A/D & D/A interface. 7.5
- 5. Describe internal architecture & working of :  $7.5 \times 2 = 15$ 
  - (a) 8259 (Interrupt Controller)
  - (b) 8237 (DMA Controller)

## SECTION – C

6. Write about different types of microcontroller :

7.5 × 2 = 15

- (i) Embedded microcontrollers.
- (ii) External Memory microcontrollers.

7. Explain various microcontroller features : 15

Clocking, I/O pins, interrupts.

## SECTION – D

8. (a) Explain the architecture of 8051 microcontrollers.

7.5

(b) Explain in brief the pin diagram of 8051 microcontroller. 7.5

9. (a) How is the 8051 interrupt priority set ? 7.5

(b) Write about various applications of microcontrollers. 7.5

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## OLE-3024

### B. Tech. 5th Sem (EE) Examination – April, 2021

#### ECONOMICS FOR ENGINEERS

Paper : HSMC-01-G

*Time : Three Hours ]*

*[ Maximum Marks : 75*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

*Note :* Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) Why is AC Curve is U Shaped ?
- (b) Explain the concept of opportunity cost.
- (c) What do you mean by oligopoly form of market ?  
State its examples.
- (d) Globalisation will bring an increase in efficiency.  
Comment.

- (e) "Indian Economy is stagnant and backward". Do you agree with the statement. Explain.

### **SECTION – A**

2. Discuss the need to redefine Economics in the light new dimensions of the economics problem and recent changes in economic theory and attempt a growth centered definition of economics.
3. What is the importance of elasticity of demand ? Why does it vary with different commodities ?

### **SECTION – B**

4. What do you understand by economies and diseconomies of scale ? Explain them in detail.
5. Write short notes on :
  - (a) Marginal Cost
  - (b) Average Cost
  - (c) Real Cost

### **SECTION – C**

6. Define Perfect competition. Discuss its main features.  
Why Perfect form of market is not practically feasible ?
7. Explain the law of supply. Also explain the role of Demand and Supply in Price determination.

### **SECTION – D**

8. Discuss the nature and characteristics of Indian economy in detail.
  9. Explain the functions of commercial Bank in detail.
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