ANJUMAN-I-ISLAM'S

AKTC **KALSEKAR TECHNICAL CAMPUS**

INNOVATIVE TEACHING   EXUBERANT LEARNING

Knowledge Resource & Relay Centre (KRRC)

AIKTC/KRRC/SoET/ACKN/QUES/2017-18/   Date: _____

School: __SoET-CBSGS__   Branch: __ELECT. ENGG.__ SEM: ____VI____

To,
Exam Controller,
AIKTC, New Panvel.

Dear Sir/Madam,

Received with thanks the following **Semester/Unit Test-I/Unit Test-II (Reg./ATKT)** question papers from your exam cell:

Sr. No.	Subject Name	Subject Code	Format SC	HC	No. of Copies
1	Power System Analysis	EEC601		✓	
2	Electrical Machine – III	EEC602		✓	
3	Utilisation Of Electrical Energy	EEC603		✓	
4	Control System – I	EEC604		✓	
5	Microcontroller & Its Applications	EEC605		✓	
6	Project Management	EEC606		✓	

Note: SC – Softcopy, HC - Hardcopy

(Shaheen Ansari)
Librarian, AIKTC

Q. P. Code: 37336

Duration – 3 Hours   **Total Marks - 80**

N.B.: - (1) Question No.**1** is compulsory.
     (2) **Attempt** any **Three** questions out of remaining **five** questions.
     (3) Assume suitable data if necessary and justify the same.

Q 1.   Answer **all questions**.   20

     A)   Explain Sequence impedances of transmission line.

     B)   Define critical disruptive voltage, visual critical voltage and corona loss.

     C)   Explain attenuation of travelling waves.

     D)   What is tower footing resistance?

Q 2 a)   Discuss Z_{BUS} building algorithm.   10

Q 2 b)   Derive the equation for fault current for LG fault.   10

Q 3 a)   What is "capacitance switching"? Explain its effect on the performance of the   10
     circuit breaker.

Q 3 b)   Explain clearly how lightning arrester is selected? What is the best location   10
     of a lightning arrester and why?

Q 4 a)   Explain in brief Selection of circuit breakers and short circuit MVA.   10

Q 4 b)   Explain protection against surges and discuss the role of surge arresters,   10
     surge capacitor.

Q 5 a)   Discuss the maximum power transfer and stability considerations in   10
     transmission line.

Q 5 b)   Describe the phenomenon of corona. Explain radio interference due to   10
     corona.

Q 6 b)   The system shown in fig. is delivering 50 MVA at 11 Kv, 0.8 lagging power   10
     factor into a bus which may be regarded as infinite. Particulars of various
     system components are:
     Generator: 60 MVA, 12 Kv, $X_d' = 0.35$ pu
     Transformers (each): 80 MVA, 12/66 KV, X=0.08 pu
     Line: Reactance 12 ohms, resistance negligible.
     Calculate the symmetrical current that circuit breakers A& B interrupt in the
     event of a three phase fault occurring at F near the circuit breaker B.
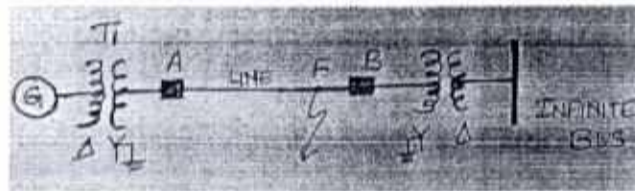
Derive the expressions of coefficients for reflection and refraction of **10** travelling waves.

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University of Mumbai <support@muapps.in>
To: controllerktc@yahoo.com

14 May at 4:08 PM

University of Mumbai

Correction in T2926 - T.E (ELECTRICAL)(Rev-2012)(CBSGS)(SEM VI) / T0850 - POWER SYSTEM ANALYSIS

QP Code: 37336

Please read last line on page 2
It's question 6a for 10 marks as written

University of Mumbai
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Mon-Fri, 10am - 5pm

Q. P. Code : 38975

(3 Hours)   (Total Marks : 80

N.B. :
1: Q No 1 is compulsory;
2: Attempt any three from the remaining questions.
3. Figure to the right indicate full marks
4. Assume any suitable data if necessary & justify,
5. Answer to the questions should be grouped and written together

Q1 a   Why 3 phase synchronous motor develops torque only at synchronous speed?   20
    b   What are the operating characteristic of an alternator connected to infinite bus?
    c   Draw the phasor diagram of salient pole synchronous motor for lagging power factor &
        leading power factor.
    d   Explain steady state analysis of Induction machine.

Q2 a   Calculate the RMS value of the induced EMF per phase of a 10 pole 3 phase 50 Hz alternator   08
        with 2 slots per pole per phase and 4 conductors per slot in 2 layers. Coil span is 150 degree
        the flux per pole is 0.12 Wb
    b   What is a synchronous condenser? Explain with the help of phasor diagram its operation.   06
        What are its applications?
    c   Explain the method of finding regulation of alternator by MMF method.   06

Q3 a   A three phase salient pole synchronous Motor has direct axis synch reactance of 0.95 pu and   08
        qudrature axis synchronous reactance of 0.6 pu. Draw the phasor diagram of the motor when
        operating at full load of 0.8 pf lagging and estimate load angle.
    b   Write a short note on Blondle two reaction theory.   06
    c   Derive the power output equation of synchronous generator and condition for maximum   06
        power output

Q4 a   A three phase synchronous motor of 8000W, 1100V has synchronous reactance of 8 ohm per   06
        phase find the minimum current and the corresponding induced EMF for full load condition.
        The efficiency of the machine is 0.8. Neglect Ra.
    b   Explain the effect of increasing load on the operation of synchronous motor excitation being 08
        kept constant.
    c   Explain the effect of armature reaction on alternator for unity & lagging power factor load   06

Q5 a   Two station generators A & B operate in parallel. Station capacity of A is 50 MW and that of 06
        B is   25 MW. Full load speed regulation of A is 3% and that of B is 3.5%. Calculate the
        load shared by A&B if the connected load is 60 MW and no load frequency is 50 Hz.
    b   Explain excitation circle and power circle of synchronous motor.   08
    c   What conditions must be fulfilled before an alternator can be connected to an infinite bus and 06
        explain two dark and one bright lamp method.

Q6   Write Notes on (any two)   20
    a   Ideal synchronous machine
    b. Starting methods of synchronous motor
    c   Slip Test

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Q. P. Code: 36420

Duration – 3 Hours   Total Marks - 80

N.B.:- (1) Question No.1 is compulsory.
         (2) **Attempt** any **three** questions out of remaining **FIVE** questions.
         (3) Assume suitable data if necessary and justify the same.

Q 1.	Answer the following questions.	20
	A) Explain Lambert's Cosine Law.	
	B) Compare AC and DC Systems of Railway Electrification.	
	C) Define Lux, Candle Power, and Maintenance Factor.	
	D) Draw Block Diagram of Electric Locomotive.	

Q 2 a)	State and describe various types of lighting schemes.	10
Q 2 b)	An electric Train has average speed of 50kmph between 2 stations having same height from the sea level and 2km apart from each other. The acceleration is 2 kmphps and Retardation is 4kmphps. Find the specific Energy consumption per tonkm of train. Specific resistance of train is 40Nw/ton. Combined motor and gear efficiency 70% and effect of rotational inertia 10%.	10

Q 3 a)	Explain with diagram vapour compression system of refrigeration.	10
Q3 b)	Explain Direct and Indirect Arc Furnace.	10

Q 4 a)	What is Photometry? Explain in detail.	10
Q 4 b)	It is required to provide an Illumination of 100 Lux in a factory hall of 30mx12m. Assume that the Depreciation factor is 0.8, co-efficient of utilization is 0.4 and efficiency of proposed lamp is 11 lumens per watt. Calculate the number of lamps and their disposition.	10

Q5 a)	Draw and explain the typical speed time curve for an electric train and explain what you understand by crest speed, average speed and schedule speed.	10
Q 5 b)	Explain series-parallel Hybrid Drive along with power flow during various operating speed.	10

Q 6	Write short Notes on:	20
	a) Laser welding.	
	b) Traction scada	
	c) Compact Fluorescent Lamps.	

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TF-Sem-VI-Electrical-CBSGS-CS-I   30/5/18

Time: 3 Hours   **Marks: 80**

Note:
- Question No. 1 is compulsory.
- Answer any **three** from the remaining five questions.
- Assume suitable data if necessary and justify the same.

Q. 1   Answer any FOUR of the following   20

    a.   What is the significance of asymptotes in root locus plot?
    b.   Explain the difference between open loop and closed loop control system.
    c.   Find how many poles are in the LHS, RHS and on the imaginary axis of s-plane of the given system.

$$\dot{x} = \begin{bmatrix} 0 & 3 & 1 \\ 2 & 8 & 1 \\ -10 & -5 & -2 \end{bmatrix} x + \begin{bmatrix} 10 \\ 0 \\ 0 \end{bmatrix} u$$

    d.   Explain gain crossover frequency, phase crossover frequency, gain margin and phase margin in frequency response technique.
    e.   Find the transfer function, $G(s) = X_2(s) / F(s)$ for circuit shown below
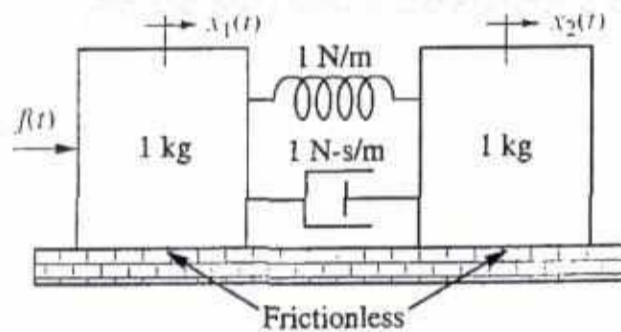
Q.2 a.   Obtain the cascade, parallel and phase variable form representation of state space and signal flow graph for the system having.   10
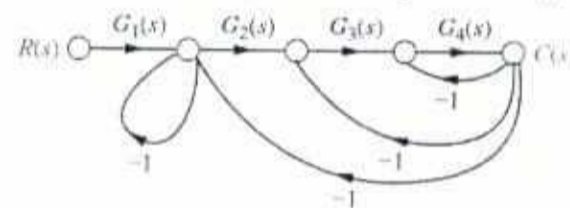
$$G(s) = \frac{24}{(s+1)(s+2)(s+3)}$$

    b.   For the following unity feedback system, using Routh Hurwitz criteria determine the   10
range of K to ensure stability. What should the value of K for the system response to oscillate, and determine the frequency of oscillations.
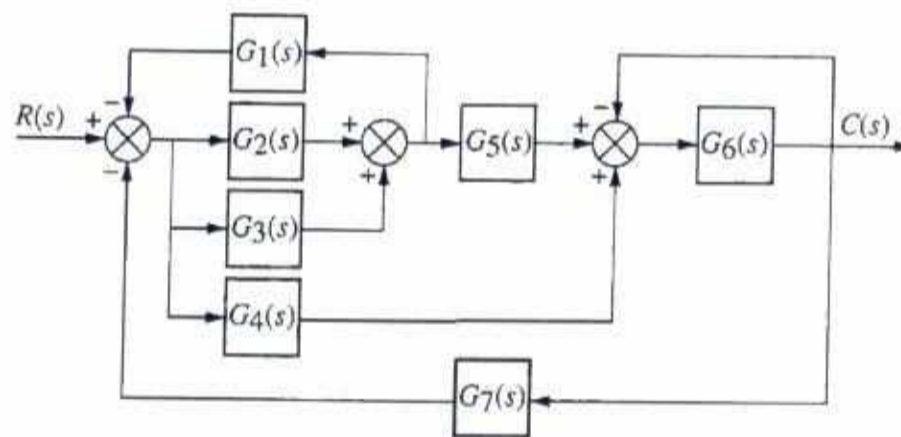
$$G(s) = \frac{K(s+3)}{s(s+1)(s+2)(s+4)}$$

Q.3 a. Obtain transfer function of the given system using Mason's gain formula   10


b. Reduce the block diagram shown below to a single block representing the transfer   10
function, G(s) = C(s)/R(s)

Q.4 a. Draw Bode log-magnitude and phase plots for the following unity feedback system,   10
determine ω_{gc}, ω_{pc}, PM, GM and comment on the stability of the system.

$$G(s) = \frac{(s + 3)}{(s + 2)\,(s^2 + 2s + 25)}$$

b. Given the electrical network shown below, find a state-space representation if the   10
output is the voltage across capacitor.
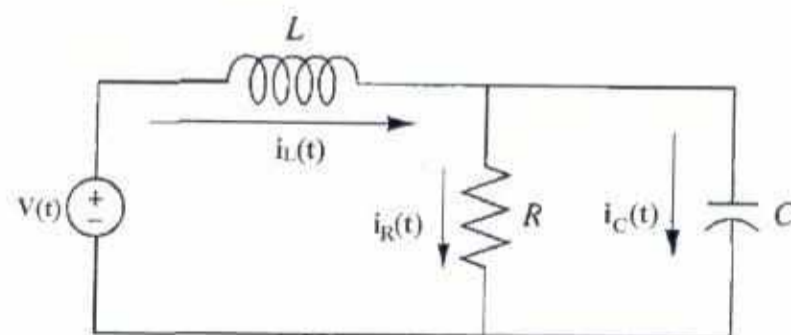
Q.5 a. Derive and explain Nyquist stability criteria.   10
b. Derive the formula for rise time, peak time, settling time and percentage overshoot   10
in step response of second order underdamped system.

Q.6 a. A unity feedback system has an open-loop transfer function   10

$$G(s) = \frac{K}{(s+3)(s^2 + 4s + 5)}$$

Draw root locus and find the location of the closed loop dominant poles if the system is operating with 15% overshoot. Also determine value of K at the above-mentioned overshoot.

b. Define and derive the steady state error and error constants with respect to unit   10
step, unit ramp and unit parabolic inputs. Consider unity feedback system.

Q.P. Code :27184

[Time: 3 Hours]   [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question no 1 is compulsory.
        2. Attempt any THREE from the remaining questions.
        3. Figures to right indicate full marks

Q.1   Attempt any Four questions.
    a) Draw and explain generic block diagram of microcontroller.   05
    b) Explain the status register in PIC 18 microcontroller.   05
    c) Explain any three branch instructions.   05
    d) Differentiate interrupt versus polling,   05
    e) Explain synchronous and asynchronous serial communication.   05

Q.2 A) What you mean by instruction format. Explain different instruction formats used in PIC 18F   10
         microcontroller.

     B) Explain the program memory and data memory organization in PIC 18 Microcontroller.   10

Q.3 A) What is stack and subroutine? Explain the instructions associated with stack and subroutine.   10

     B) Write a program in PIC18 using Timer0 to generate a train of pulses of 100Hz frequency on PORTB pin   10
         RB7. Use 16 bit programming technique with 128 prescaler. The internal frequency of microcontroller is
         10Mhz.

Q.4 A) Draw and explain the simple IO device interface (switches and LEDs) with PIC microcontroller and   10
         hence explain I/O addressing.

     B) Explain the following resisters used in serial communication   10
         i) SPBRG   ii) TXREG   iii) RCREG   iv) PIR1

Q.5 A) Explain the IO PORT structure in PIC 18F microcontroller and Special Function Registers associated with   10
         them.

     B) Explain the ADC module in PIC 18 microcontroller and hence explain ADCON0.   10

Q.6 A) Explain the LCD interfacing with microcontroller.   10
     B) Explain the stepper motor interfacing with PIC microcontroller.   10

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11/6/1c

Q. P. Code: 50910

Duration – 3 Hours   **Total Marks assigned to the paper- 80**

N.B.:- (1) Question No.**1** is compulsory.
(2) **Attempt** any **three** questions out of remaining **FIVE** questions.
(3) Assume suitable data if necessary and justify the same.

Q 1.   Answer the following questions.   20
A) Write the formula for IRR method of profitability and explain ?
B) What is pre-feasibility and what are the advantages of pre-feasibility analysis?
C) List the different types of contracts and explain briefly.
D) Illustrate the difference between market analysis and demand analysis?

Q 2 a) Write a detailed note on different types of communication in Project   10
Management.
Q 2 b) What are the steps involved in Financial analysis.   10

Q 3 a) With an example illustrate the resource levelling technique.   10
Q3 b)   What are the different types of project organisations? Explain.   10
Q 4 a) Consider a project having the following activities and their associate time 10

estimates.

Activity	1-2	1-3	2-4	3-5	2-5	4-6	5-6	6-7	5-7
Normal cost	3000	4000	4000	2000	8000	10000	4000	6000	4200
Crash cost	6000	8000	5500	3200	12000	11200	6800	8700	9000
Normal time	8	5	9	7	5	3	6	10	9
Crash time	4	3	6	5	1	2.5	2	7	5

Draw network, show critical path and calculate the cost-time slope for each   10

activity

Q 4 b) Justify, how motivation theories are important in HR management   10

Q5 a)   Write short notes on tendering process?   10
Q 5 b) Write a detailed note on project quality Management and TQM methods. 10

Q 6 a) What is Project integration Management? Explain.   10
Q 6 b) Illustrate PERT method of project scheduling.   10

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