Hall Ticket Number :										

R-11 / R-13

Code: 1G241

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Electrical Machines-II

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. Explain the principal of operation of transformer. Derive its e. m. f. equation.

2. a) In a transformer, derive the condition for maximum efficiency and thus find the load current at which the efficiency is maximum.

   b) A200kVA 1-phasetransformer is in operation continuously. For 8 hours in a day, the load is 160kW at 0.8 pf. For 6 hours, the load is 80kW at unity pf and for the remaining period of 24 hours it runs on no-load. Full-load copper losses are 3.02 kW and the iron losses are 1.6 kW. Find all-day efficiency.

3. a) Discuss how you will perform O.C and S.C tests on a single phase transformer in the Laboratory.

   b) A 6 kVA, 250/500 V, transformer gave the following test results:

   Short-circuit test: 20 V ; 12 A, 100 W

   Open circuit test: 250 V; 1 A, 80 W

   Determine the transformer equivalent circuit.

4. Draw the Connection diagram of Y- Y and Δ - Δ connected three-phase transformer.

5. a) How does the rotor speed differ from synchronous speed explain in detail with neat diagram? Also what is meant by the term slip and explain its significance.

   b) The star connected rotor of an induction motor has a standstill impedance of (0.4+j4) ohm per phase and the rheostat impedance per phase is (6+j2) ohm. The motor has an induced emf of80V between slip-rings at stand-still when connected to its normal supply voltage. Find (i) rotor current at standstill with the rheostat is in the circuit and

   (ii) When the slip-rings are short-circuited and motor is running with a slip of 3%.

6. Derive the following (i) Torque equation of an induction motor (ii) Condition for Maximum Torque? (iii) Relation between starting torque and full load torque in terms of maximum torque.

7. a) Explain no load tests and blocked rotor tests for an 3-phase induction motor.

   b) In a no load test, an induction motor took 10 A and 450 W with a line voltage of 110 V. If stator resistance per phase is 0.05 Ω and friction and windage losses amount to 135 W. calculate the exciting conductance and susceptance/ph.

8. Explain the principle of operation of Induction generator with the help of torque -speed characteristics.

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Hall Ticket Number :										

R-11 / R-13

Code: 1G244

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Linear Control Systems

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks each**)

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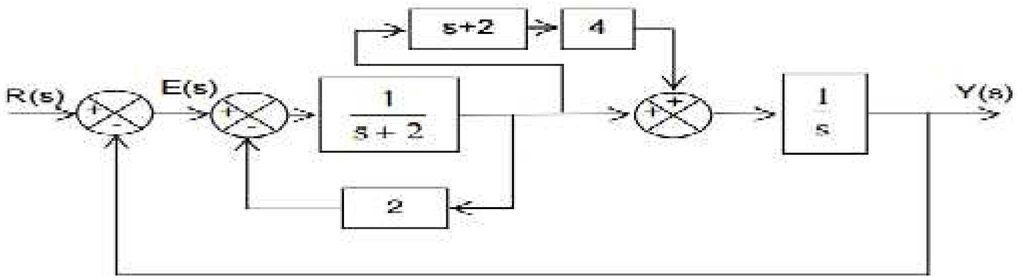
1. a) Define open loop and closed loop control system.
   b) Explain open loop and closed loop Temperature control system with neat sketches.
2. a) Explain Block diagram algebra with clear figures
   b) Use the Block diagram reduction technique to find the transfer function Y(S)/R(S)



3. Define Delay time, Rise time, Peak time, Maximum overshoot, Settling time with a neat sketch. And derive expression for any two of the above.

4. Determine the stability using Routh Criterion of the closed loop transfer function

$$G(s) = \frac{10}{S^5 + 2S^4 + 3S^3 + 6s^2 + 5S + 3}.$$

5. Explain the procedure for magnitude and phase plot of Bode plot

6. a) Define Polar plot.
   b) Explain the procedure to determine the Gain margin and Phase margin from Polar plot.

7. Explain the procedure for the design of lead compensator in Frequency Domain.

8. Estimate the complete state controllability and observability of the system using Jordan Canonical form $A = \begin{bmatrix} -1 & 1 & 0 \\ 0 & -4 & 2 \\ 0 & 0 & -10 \end{bmatrix}; B = \begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}; C = \begin{bmatrix} 1 & 0 & 1 \end{bmatrix}.$

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Hall Ticket Number :										

R-11 / R-13

Code: 1GC41

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Mathematics-III

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. a) Define Beta function. Prove that $(m,n) = (n,m)$

   b) Find the value of $\int_0^1 x^3 \sqrt{1-x}\, dx$ using and Γ functions

2. State and Prove Cauchys-Reimann equations in Cartesian form.

3. Find the general and principal values of

   a. i^i b. $\log\left(1+i\sqrt{3}\right)$

4. a) Evaluate $\int_c (x+y)\,dx + x^2 y\, dy$ from (0,0) to (3,9) along the straight line $x^2 = y$.

   b) Find $\int_c \frac{1}{(z-1)(z-3)} dz$ with C: $|z| = 2$ using Cauchy's integral formula.

5. Expand $f(z) = \frac{z-1}{z+1}$, in Taylor series about the point $(i): |z| = 0$ $(ii): |z| = 1$

6. Using Residue Theorem, Evaluate $\int_0^{2®} \frac{1}{5+4\cos –} d–$

7. State and prove Argument principle.

8. Find the fixed points of the transformation

   (a) $w = \frac{6z-9}{z}$ (b) $w = \frac{z-1}{z+1}$

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Hall Ticket Number :										

R-11/R-13

Code : 1G343

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2018

Pulse and Digital Circuits

(Electrical & Electronics Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Define % tilt of RC circuit. Obtain the response of RC high pass circuit for a ramp input. 7M
   b) What is a Differentiator and draw the circuit diagram of a Differentiator. 4M
   c) Compare low pass and high pass RC circuits. 3M

2. a) Draw the circuit diagram of a DC restorer circuit with and without reference voltage and explain its operation for a sinusoidal input signal. 6M
   b) Give the importance of clamping circuits. 4M
   c) Write about a positive clamper. 4M

3. a) Explain in detail the junction diode switching times. 7M
   b) Discuss the breakdown mechanisms of a transistor. 7M

4. a) What are the effects of commutating capacitors in a binary? Give reasons 7M
   b) Discuss self biased binary. 7M

5. a) Explain the basic principle of a bootstrap sweep generator. Draw the circuit and explain its operation. Derive the expression for its slope error. 7M
   b) List out the various methods to generate a time base waveform 7M

6. a) Discuss the applications of a sampling gate. 7M
   b) Write about bidirectional diode sampling gate. 7M

7. a) Explain use of a mono stable relaxation device as a divider 7M
   b) Explain the synchronization of a sweep circuit with symmetrical signals 7M

8. a) With the help of a neat circuit diagram for NOR gate using ECL logic and explain 7M
   b) Illustrate the TTL totem pole operation of a NAND gate. 7M

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