Total No. of Questions : **08** Roll No. : 0701.....

B.Tech SIXTH SEMESTER EXAMINATION JUNE-2025

(Branch : Elx. & Communication Engineering)

EC-6301 CONTROL SYSTEM

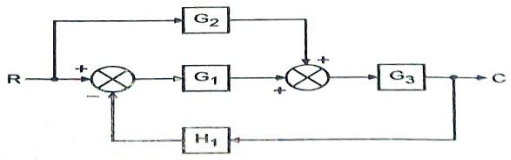
Time : Three Hours ***Maximum Marks : 70***
Min. Pass Marks : 22

Note : Attempt any five questions. Each question carries equal marks.

1(a) Give the effect of feedback on the following parameter : ***06***

(i) Gain (ii) Sensitivity (iii) Noise (iv) Stability
(v) Pole location (vi) Time constant

(b) Using block reduction method, obtained the T.F. C(s)/R(s) for the system shown in figure below : ***08***



2(a) For the system represented by the given equations find the transfer function : ***07***

x_5/x_1 by the help of signal flow graph :

$$x_2 = a_{12}x_1 + a_{32}x_3 + a_{42}x_4 + a_{52}x_5$$

$$x_3 = a_{23}x_2, \quad x_4 = a_{34}x_3 + a_{44}x_4, \quad x_5 = a_{35}x_3 + a_{45}x_4$$

Where x_1 is the input variable and x_5 is the output variable.

(b) Determine by using routh criterion, the maximum value of K for the close loop system to be stable, where the open loop transfer function is : ***07***

$$G(s)H(s) = Ke^{-s}/\, s\,(s^2 + 5s + 9)$$

3(a) The forward path transfer function of the unity feedback system is given by – ***08***

$$G(s) = K\,/\,s(s+4)\,(s+5)$$

Sketch the root locus as K varies from zero to infinite.

(b) Explain the different rules for construction of root locus. ***06***

4(a) The close loop transfer function is given by - ***07***

$$G(s) = 36\,/\,(s^2 + 6s + 36)$$

Determine the rise Peak time, settling time, maximum overshoot.

(b) The forward path transfer function of the unity feedback control system is given by – ***07***

$$G(s) = k\,/\,s(s+20)$$

(i) Determine the study state error for unit Ramp input when k = 800.

(ii) Also determine the value of k for which the study state error to the unit ramp will be 0.04.

P.T.O.

5(a) A System is characterized by the transfer Function ***07***

$$\frac{Y(s)}{U(s)} = 2/(s3 + 6s2 + 11s + 6)$$

Find the state and output equation in matrix form, draw the block diagram and also test the controllability and observability of the system.

(b) A system is described by the matrices - ***07***

$$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{bmatrix} \qquad B = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} \qquad C = [\,1 \quad 2 \quad 0\,]$$

Determine the block diagram and obtain the state model.

6(a) Draw the polar plot for the following transfer function : ***08***

$$G(s) = 1 / s\,(1 + sT)$$

(b) Explain Gain crossover frequency, Phase crossover frequency, gain margin, phase margin, and stability of polar plot. ***06***

7(a) A unity system control system has – ***08***

$$G(s)H(s) = 2 / s\,(1 + 0.5s)(1 + 0.05s)$$

Draw the bode plot. From bode plot determine gain margin, phase margin, gain crossover frequency and phase crossover frequency. Comment on the stability.

(b) Give the different rules to draw the bode plot. ***06***

8 Write a short notes on **any two** : ***14***

(i) Compensation
(ii) Steps for Nyquist stability criterion
(iii) Synchros Transmitter
(iv) Compare Open loop and close loop control system.

*****

Total No. of Questions : **08** Roll No. : 0701.....

B.Tech SIXTH SEMESTER EXAMINATION JUNE-2025

(Branch : Elx. & Communication Engineering)

EC-6302 COMPUTER NETWORK

Time : Three Hours ***Maximum Marks : 70***
Min. Pass Marks : 22

Note : Attempt any five questions. Each question carries equal marks.

1(a)	Draw OSI model. Explain function of each layer in detail.	***07***
(b)	Explain simple stop and wait protocol for noise free channel.	***07***
2(a)	What do you understand by switching? Explain its types in detail.	***07***
(b)	Explain blocking in packet switches in detail. Also explain multicasting.	***07***
3(a)	Explain transmission control protocol in detail.	***07***
(b)	What do you understand by limited contention protocol? Explain any one protocol in detail.	***07***
4(a)	Explain congestion avoidance mechanism in detail.	***07***
(b)	Explain Token Ring (802.5) in detail with a neat diagram. Also explain FDDI.	***07***
5(a)	Compare Aloha and slotted Aloha protocol in detail. Derive efficiency of Aloha.	***07***
(b)	What do you understand by routing? Why routing algorithm is needed in computer networks?	***07***
6(a)	Explain shortest path routing algorithm in detail.	***07***
(b)	What do you understand by 'Go back to 'n'' protocol? Explain selective repeat protocol in detail.	***07***
7	How to allocate a single broadcast channel among competing users in multi-access channel? Explain static channel allocation in detail.	***14***
8	Write short notes on **any two** : (i) CSMA protocols (ii) FDMA (iii) Ethernet	***14***

*****

Total No. of Questions : **08** Roll No. : 0701.....

B.Tech SIXTH SEMESTER EXAMINATION JUNE-2025

(Branch : Elx. & Communication Engineering)

EC-6321 (EL-II) ANTENA AND WAVE PROPAGATION

Time : Three Hours ***Maximum Marks : 70***
Min. Pass Marks : 22

Note : Attempt any five questions. All questions carry equal marks. Draw neat diagrams wherever needed. Assume missing data if any

1(a) Explain the following terms :- ***07***

(i) Radian and Steradian (ii) Radiation pattern (iii) Antenna gain and efficiency.

(b) Derive the FRIIS transmission equation for antennas. ***07***

2(a) An antenna is having a field pattern given by :- ***07***

$$E(\theta) = Cos\theta, \ for \ \ 0 \leq \theta \leq 90^{o}.$$

Find HPBW and FNBW and show in the diagram.

(b) The radiation resistance of an antenna is 80 ohms, and the loss resistance is 10 ohms. What is the directivity if antenna power gain is 16. ***07***

3(a) Explain clearly Hygen's principle and working of horn antenna. ***07***

(b) Describe the working of Parabolic Reflector antennas and their advantages and disadvantages. ***07***

4(a) Discuss the construction and working of Yagi–Uda Antenna with applications. ***07***

(b) Explain the designing of any one rectangular patch antenna. ***07***

5(a) Explain and Compare broadside arrays and End fire arrays. ***07***

(b) Describe the construction and working of Log Periodic arrays. ***07***

6(a) Describe clearly the Smart antennas and their benefits. ***07***

(b) What are different mechanisms for propagation of radio waves? Describe clearly. ***07***

7(a) With neat block diagram, describe the method of obtaining the radiation pattern of an antenna. ***07***

(b) Describe the radiation pattern of half wave dipole clearly. ***07***

8 Write notes on **any two** : ***14***

(i) Travelling wave antennas and rhombic antenna.
(ii) Antenna theorems.
(iii) Fraunhofer and Fresnel zones.

*****

Total No. of Questions : **08** Roll No. : 0701.....

B.Tech SIXTH SEMESTER EXAMINATION JUNE-2025

(Branch : Elx. & Communication Engineering)

CS-6351 (OEL-II) DATA BASE MANAGEMENT SYSTEM

Time : Three Hours ***Maximum Marks : 70***
Min. Pass Marks : 22

Note : Attempt any five questions. Each question carries equal marks.

1(a) Discuss the role of Database Administrator. ***07***

(b) Discuss the architecture of Database. ***07***

2(a) Distinguish between the following : Database approach and Traditional approach. ***07***

(b) Discuss the role of different type of Database User. ***07***

3(a) Draw an E-R diagram for a college database with almost all components and explain it. ***07***

(b) Explain the concept of Generalization and Aggregation with appropriate example. ***07***

4(a) Describe any fundamental operations of relational algebra. ***07***

(b) Explain following with example : (i) Tuple Relational Calculus ***07***
(ii) Domain Relation Calculus

5(a) Consider the employee database, where the primary keys are underlined. Give an expression in relational algebra for each of the following queries. ***07***

- employee (employee name, street, city)
- works (employee name, company name, salary)
- company (company name, city)
- manages (employee name, manager name)

(i) Modify the database so that Jones now lives in Newtown.
(ii) Give all employees of First Bank Corporation a 10 percent salary raise.
(iii) Delete all tuples in the *works* relation for employees of Small Bank Corporation.
(iv) Give all managers in this database a 10 percent salary raise.

(b) What are aggregate functions of SQL? Explain with suitable example. ***07***

6(a) Define normalization and types of normalization with example. ***07***

(b) Explain Armstrong's Axioms (rule of inference) which held's on functional dependencies. ***07***

7(a) What is transaction in database? Discuss the ACID properties of transaction. ***07***

(b) Differentiate conflict serializability and view serializability with suitable example. ***07***

8(a) Discuss the following : (i) Primary Index (ii) Secondary Index (iii) Multilevel Index. ***07***

(b) Discuss the steps of Query Optimization. ***07***

*****

Total No. of Questions : **08** Roll No. : 0701.....

B.Tech SIXTH SEMESTER EXAMINATION JUNE-2025

(Branch : Elx. & Communication Engineering)

HS-6352 ECONOMIC POLICIES IN INDIA

Time : Three Hours ***Maximum Marks : 70***
Min. Pass Marks : 22

Note : Attempt any five questions. Each question carries equal marks. All parts of a question must be attempted at the same place.

1(a) Explain marginal efficiency of capital giving suitable diagram, formulae and factors affecting it.

(b) Explain balance of payment and demand and supply of money clearly.

2(a) Explain the nature and components of monetary policy of India.

(b) Discuss growth and stabilization effects of monetary policy operations.

3(a) Discuss the nature and component of fiscal policy in detail.

(b) Discuss the salient features of Fiscal deficit and its management in detail.

4(a) Discuss financial sector performance and impending reforms in detail.

(b) Discuss Macroeconomic stabilization and structural reforms clearly.

5(a) Discuss the economic reforms towards more liberalization for agriculture in India.

(b) Discuss economic reforms in the field of services towards more liberalization in India.

6(a) Discuss Central banking operations and aspects of monetary management.

(b) Discuss the impact of economic reforms on industries in India in detail.

7(a) Discuss Fiscal policy operations for macroeconomic growth in detail.

(b) Discuss corporate adjustment to monetary and fiscal variations.

8(a) Discuss motive for holding money and liquidity preference in detail.

(b) Discuss multiplier, accelerator and investment behavior of capital.

*****