

**FACULTY OF ENGINEERING & INFORMATICS****B.E 3/4 (Civil/CSE/IT) I – Sem. (Main & Backlog) Examination, December, 2017****Subject : Managerial Economics and Accountancy****Time : 3 Hours****Max Marks : 75****Note: Answer all questions from Part – A & Any five questions from Part – B.****PART – A (25 Marks)**

1. Define Managerial Economics ( 2)
2. Price Elasticity (2)
3. Define monopoly (2)
4. Pay back period (2)
5. Recording of day to day transactions in a book called (2)
6. Law of diminishing marginal utility (3)
7. What is breakeven point? (3)
8. Fixed and working capital (3)
9. What is petty cash book? (3)
10. Risk and uncertainty (3)

**Part – B (50 Marks)**

- 11 What is demand forecasting? Explain the techniques of demand forecasting
12. Fundamental Principles of managerial economics
13. What is Internal and external Economics of Scale
- 14 Calculate : 1. Breakeven point 2. Margin of safety 3. Sales required to earn a profit of Rs 50,000 from the following information sales Rs. 1,00,000 fixed cost Rs. 75,000 variable cost Rs. 3,00,000.
15. Find out the average rate of return from the following data relating to machines 1 and 2 cost Rs. 3,00,000 each, estimated life 4 year each, estimated scrap Rs. 60,000 each the estimated cash inflows'

Year	1	2	3	4
Machine-1	1,00,000	3,00,000	1,50,000	---
Machine – 2	2,00,000	3,00,000	2,50,000	1,50,000
16. Prepare bank Recoveiliation statement as on 31-12-2013 from the following particulars of Mohan Rao.
  - a) Bank Balance as per cash book Rs. 28,000
  - b) Cheques deposited in bank on 28-12-2013 amounted to Rs. 2,400 were not collected.
  - c) Cheques amounting to Rs. 3,000 issued before 27-12-2013 were not presented for payment.
  - d) Interest on investment Rs. 800 credited by the bank in pass book only
  - e) Bank charges Rs. 20 debited in pass book only

17. from the following particulars prepare trading and profit and loss account of surya for the year ending 31-12-2008

## Trial Balance

Particulars	Debit Rs	Credit Rs
Surya's Capital		25,000
Opening stock	6,200	
Cash	1,700	
Sundry Debtors	9,100	
Purchases	61,300	
Sales		93,600
Return out words		1,800
Return in words	500	
Carriage in words	3,700	
Carriage out words	7,200	
Salaries	7,200	
Rent	6,000	
Sundry credits		4,000
Discounts Received		100
Drawings	6,300	
Furniture and fittings	10,800	
Printing and stationary	1,200	
	1,24,500	1,24,500

Adjustment : Closing stock pm 31 – 12 2008 was valued at Rs. 7,800

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## FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I – Semester (Main & Backlog) Examination, December 2017

Subject: Pulse & Digital Circuits

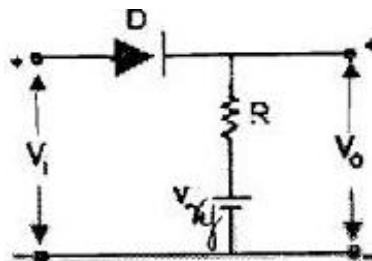
Time: 3 Hours

Max. Marks: 75

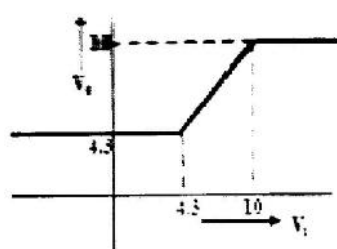
**Note: Answer all Questions from Part A and any Five Questions from Part B**

### PART – A (25 Marks)

1. Show that a RC low pass filter can work like an integrator (2)
2. Draw the response of high pass filter when the input  $f(t) = u(t) - u(t-2)$  is applied to it (3)
3. State the clamping circuit theorem (2)
4. Draw the output of the clipper given in following figure, for a sine wave input of 4v peak to peak, given  $V_{ref} = 2$  Volts. (3)



5. Give the application of bistable multivibrator. (2)
6. What are the three types of errors that occurs in time base generators. (3)
7. Explain the concept of fan – in of a gate with an example. (3)
8. Give the design of OR gate using DTL Logic and explain its operation. (2)
9. Explain ;the operation of CMOS transmission gate. (2)
10. Draw the circuit of CMOS NAND gate. (3)
- 11 a) Derive the condition for perfect attenuation of a compensated attenuator (5)
- b) Sketch the response of a differentiator to a symmetrical square wave input of frequency 5 KHz and amplitude  $\pm 6$  Volts. Given time constant for the circuit is 5 msec.
- 12 a) Explain the operation of a positive peak clamper. (4)
- b) Design a clipper circuit for the following transfer characteristics assuming ideal diodes (6)



- 13 a) How can astable multivibrator be used as an oscillator. (5)  
b) Explain UTP and LTP in Schmitt trigger circuit. (5)
- 14 a) Explain working of a three input TTL NAND gate with to tempole output. (6)  
b) Draw the circuit diagram of a tri-state Inverter and explain its operation. (4)
- 15 a) Implement the function  $F = (AB + ACD)$  using CMOS logic family. (6)  
b) What is significance of Totempole output in TTL logic family. (4)
- 16 a) Give the design of a sweep circuit using a UJT. (5)  
b) What is the advantage of open collector output and where is it used. (5)
- 17 Write short notes on: (10)  
a) Step response of RLC circuit  
b) Transistor switching times c) ECL logic (10)

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**FACULTY OF ENGINEERING**

**BE 3/4 (AE) I- Semester (Main & Backlog) Examination, December, 2017**

**Subject: Automotive Transmission**

**Time: 3 hours**

**Max. Marks: 75**

**Note : Answer all questions from Part-A & Any Five Questions from Part-B.**

**PART – A (10x2.5 = 25 MARKS)**

- 1 Explain the working principle of cone clutch
- 2 Draw performance characteristic curves of gear at different speeds
- 3 How gear ratios are determined in planetary gear box?
- 4 Explain the working principle of Ford T model gear box
- 5 What are the merits and demerits of fluid coupling?
- 6 How torque capacity is calculated in fluid coupling?
- 7 What are the merits and demerits of automotive transmission over conventional transmission?
- 8 What is meant by automotive control of gear box?
- 9 What are the advantages and disadvantages of hydro static drives?
- 10 What are the merits and demerits of electrical drives?

**PART – B (5x10 = 50 MARKS)**

- 11 Explain the working principle of centrifugal clutch and semi-centrifugal clutch and write merits and demerits of one over the other.
- 12 Explain the working principle of Wilson gear box and compare it with Cotal gear box
- 13 What are different ways to reduce drag torque in fluid coupling?
- 14 How automatic control of gears is performed and write typical automatic transmission of Ford drive?
- 15 Write working principle of typical hydrostatic drive along with constructional details
- 16 Explain the working principle of modern electric drive for bus
- 17 Explain the operation and constructional details of typical hydraulic transmission drive like Leyland.

## FACULTY OF ENGINEERING

**BE 3/4 (EEE/Inst.) I- Semester (Main & Backlog) Examination December 2017**  
**Subject: Linear Control Systems**

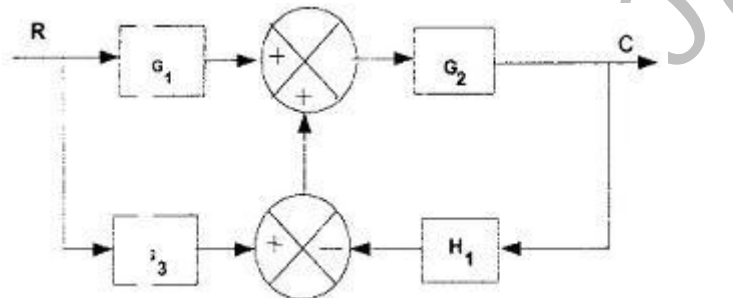
Time: 3 hours

Max. Marks: 75

**Note : Answer all questions from Part-A & Any Five Questions from Part-B.**

### PART – A (25 MARKS)

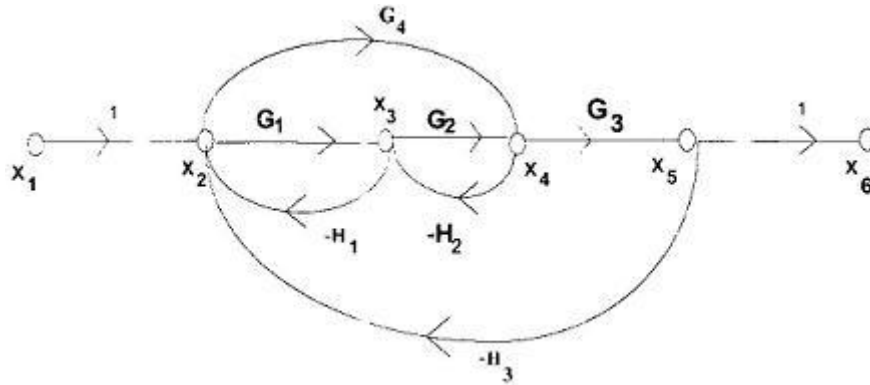
1. Find the Transfer function of the control system shown in figure. 3



2. Write analogous electrical and mechanical quantities based on force voltage analogy. 2
3. How to determine relative stability using Routh Hurwitz criterion? Explain with an example. 3
4. What is difference between order and type of a system? 2
5. Define Phase margin and Gain margin. 2
6. Draw the polar plot for the transfer function  $G(s) = \frac{s+3}{s(s+1)(s+2)}$  3
7. What are the advantages of state model over transfer function? 2
8. Check the controllability of the system 3
- $$\begin{pmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{pmatrix} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & -2 & -3 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} + \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} u$$
9. What is the condition for stability in Z-domain? 2
10. Obtain the Z-Transform for ramp input function. 3

**PART – B (50 MARKS)**

- 11 a) Derive the Transfer function for Armature controlled DC servomotor. 5  
 b) Find the  $x_6 / x_1$  for the signal flow graph shown in figure. 5



- 12 A unity feedback system has an open loop transfer function is [10]

$$G(S) = \frac{K}{s(s^2 + 4s + 13)}$$

sketch the root locus

- 13 By use of Nyquist criterion, determine whether the closed loop system [10]

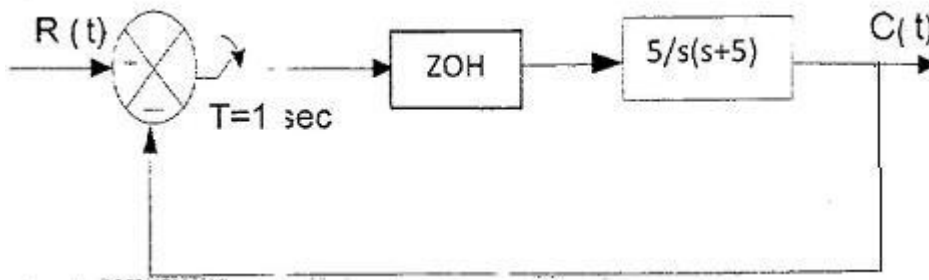
having the following open loop transfer function is stable or not. If not then how many closed loop poles lie in the right of S-plane?

$$G(s) H(s) = \frac{1 + 4s}{s^2(s + 1)(2s + 1)}$$

- 14 State and prove the properties of state transition matrix (STM) and compute STM for the following system. [10]

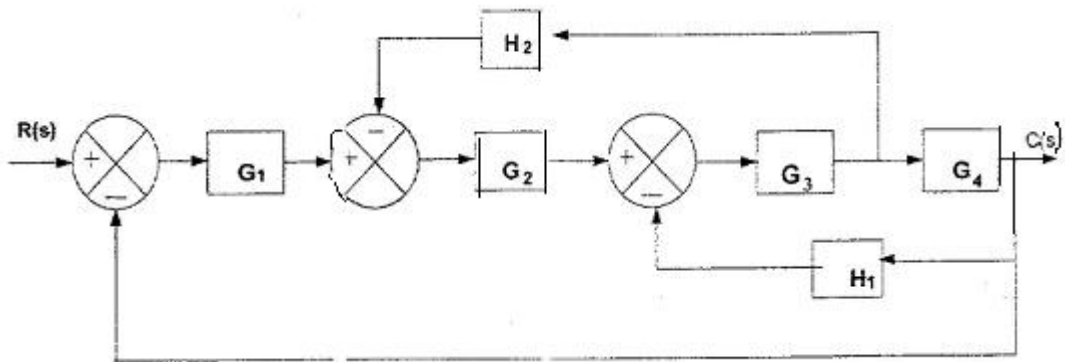
$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & 1 \\ 2 & -3 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 2 \end{bmatrix} u$$

- 15 Determine  $\frac{C(z)}{R(z)}$  for the following system. [10]



- 16 a) Determine the overall transfer function  $C(s) / R(s)$  for the system shown in figure.

5



- b) With a neat diagram explain Digital control system architecture.

5

- 17 The open loop transfer function of a servo system with unity feedback is

10

$G(s) = \frac{10}{S(1+0.1S)}$ . Evaluate the static error constants of the system and obtain the steady state error of the system when subjected to an input given by the polynomial

$$r(t) = a_0 + a_1t + \frac{a_2t^2}{2}.$$

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