

FACULTY OF ENGINEERING / INFORMATICS**B.E. 3/4 (Civil / CSE / IT) I – Semester (Old) Examination, December 2016****Subject: Managerial Economics & Accountancy****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A. Answer any five questions from Part B.****PART – A (25 Marks)**

- 1 Explain the term micro and macro economics
- 2 State the law of supply
- 3 What is cross elasticity of demand?
- 4 Define the terms explicit and implicit cost
- 5 What are various determinants of demand?
- 6 What do you mean by pay back period?
- 7 Explain about subsidiary books
- 8 What are various sources of capital?
- 9 What is the use and significance of trial balance?
- 10 Define production function.

PART – B (50 Marks)

- 11 Define managerial economics? Explain the fundamental concepts of managerial economics.
- 12 Explain the law of demand with the help of assumptions, tables and diagrams.
- 13 Critically explain the law of variable proportions.
- 14 What is perfect competition and how price is determined under perfect competition?
- 15 A firm has a fixed cost of Rs. 50,000, selling price per unit is Rs. 50 and variable cost is Rs. 25. Present level of production is 3,500 units, determine 1. Bep 2. Margin of safety 3. If the fixed cost increases to Rs.60,000, calculate the new Bep and margin of safety.
- 16 From the following information prepare a Bank Reconciliation Statement as on 31st December 2011.
 - 1) Balance as per pass book Rs. 20,000
 - 2) Cheques issued but not presented for payment Rs. 5,000
 - 3) Cheques deposited in bank but not shown in pass book Rs. 3,000
 - 4) Bank charges Rs. 50 and interest on deposits Rs. 500 was recorded in pass book but no entry was made in cash book.
- 17 From the following information prepare balance sheet:
Machinery Rs. 50,000, furniture Rs. 20,000. Prepaid expenses Rs. 1,000, outstanding income Rs. 2,000, income received in advance Rs. 2,000, outstanding expenses Rs. 1,000, bills payable Rs. 3,000, bills receivable Rs. 2,000, sundry debtors Rs. 50,000. Investment Rs. 50,000, bank loan Rs. 10,000, closing stock Rs. 35,000, long term loan Rs. 1,00,000, building Rs. 1,00,000, capital Rs. 2,00,000, goodwill Rs. 50,000, land Rs. 20,000, net profit Rs. 50,000, drawings Rs. 10,000, cash at bank Rs. 20,000, cash in hand Rs. 5,000, sundry creditors Rs. 49,000.

FACULTY OF ENGINEERING / INFORMATICS**B.E. 3/4 (Civil/CSE/IT) I-Semester (New) (Main) Examination, Nov. / Dec. 2016****Subject : Managerial Economics and Accountancy****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- | | |
|---|---|
| 1 Define payback method. | 2 |
| 2 Incremental principle. | 3 |
| 3 What is imprest system? | 2 |
| 4 What is a journal proper? | 3 |
| 5 What is Veblen effect? | 3 |
| 6 Write about profitability index. | 2 |
| 7 Define concept of Equilibrium. | 2 |
| 8 Incremental costs and sunk costs. | 3 |
| 9 Write any two sources of working capital. | 3 |
| 10 Define managerial economics. | 2 |

PART – B (5 x 10 = 50 Marks)

- 11 Explain the role and responsibility of Managerial Economics.
- 12 What are the determinants of demand for a commodity by consumer? Explain.
- 13 Write about the ISO-QUANT production function in detail.
- 14 Explain various determinants of working capital of a concern.
- 15 From the following details of two machines X and Y, each costing Rs.1,20,000 and having a life time of 4 years. Cash flows after tax are expected to be as follows : Cost of capital may be assumed to be 8%. Compare the project using NPV and Profitability index

Year	Machine X (Rs.)	Machine Y (Rs.)
1	65,000	20,000
2	50,000	35,000
3	35,000	50,000
4	20,000	80,000

- 16 Calculate P/V ratio, break-even point and margin of safety from the following details.
Sales = Rs.4,00,000
Fixed cost = Rs.1,00,000
Variable cost = Rs.2,90,000

17 From the following balances of Gupta, prepare the Trading and Profit and loss a/c as on 31.03.2004.

<u>Particulars</u>	<u>Amount (Rs.)</u>
Opening stock	20,000
Salaries	25,000
General expenses	2,000
Rent and Taxes	3,000
Purchases	90,000
Freight Inward	2,500
Advertising	1,500
Sales	1,85,000
Discount allowed	1,800
Discount received	1,000

Adjustments :

Closing stock Rs.18,000

FACULTY OF ENGINEERING

B.E. 3/4 (EEE/Inst.) I-Semester (Old) Examination, Nov. / Dec. 2016

Subject : Linear Control Systems

Time : 3 hours

Max. Marks : 75

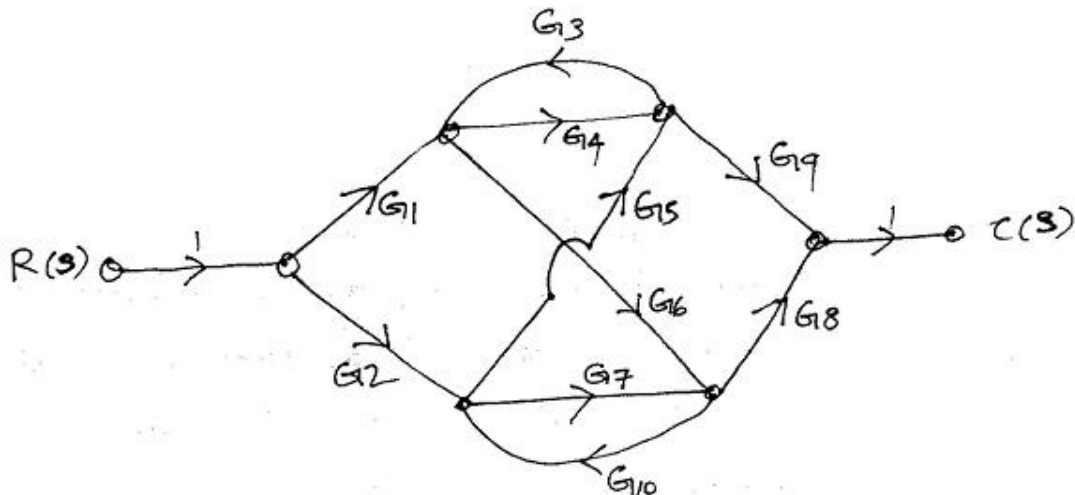
Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

- 1 Draw the circuit diagram of a potentiometer used as an error detector in a position control system using direct current (dc) supply and also show the block diagram representation. 3
- 2 State the advantages of feedback in control systems. 3
- 3 A certain system is required to follow a parabolic input with zero error under steady state conditions. What will be the 'type' of the system. 2
- 4 What are time domain specifications? 3
- 5 Define gain margin and phase margin. 2
- 6 State the Nyquist criterion for stability. 2
- 7 Define controllability and observability. 3
- 8 What are the advantages of state variable representation of control systems? 2
- 9 Compare digital and analogue controllers. 3
- 10 What is the transfer function of zero order hold? 2

PART – B (50 Marks)

- 11 Find the transfer function for the signal flow graph shown below. 10



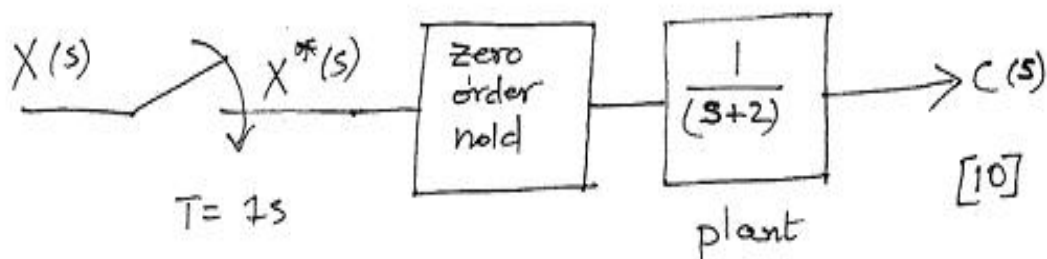
- 12 Draw the root locus diagram for the system with the open loop transfer function given by $G(S)H(S) = \frac{K(S+2)}{S^2 + 2S + 3}$. Also find the value of gain for which the system will have a damping ration of 0.7. 10

..2

13 Draw the bode plot for the system given by $G(S)H(S) = \frac{10}{S(S+1)(S+2)}$. Find the gain margin and phase margin from the bode plot. 10

14 Find the transfer function of the system represented by the vector matrix differential equation $\dot{X} = \begin{bmatrix} -2 & 0 & 1 \\ 1 & -2 & 0 \\ 1 & 1 & -1 \end{bmatrix} X + \begin{bmatrix} 1 \\ 0 \\ 10 \end{bmatrix} u$ and output $Y = [2 \ 1 \ -1]X$. 10

15 Find the pulse transfer function of the system given below 10



16 Show the Nyquist plot for the system given by the open loop transfer function $G(S)H(S) = \frac{K}{S(TS-1)}$ and determine the stability of the system. 10

17 Find the state transition matrix for a system described by $\dot{X} = AX$ where $A = 3 \begin{bmatrix} 0 & 1 \\ -6 & -5 \end{bmatrix}$.

FACULTY OF ENGINEERING

B.E. 3/4 (EEE/Inst.) I-Semester (New) (Main) Examination, Nov. / Dec. 2016

Subject : Linear Control Systems

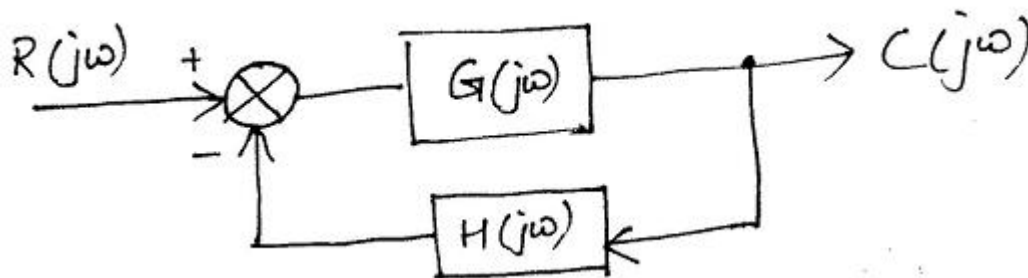
Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

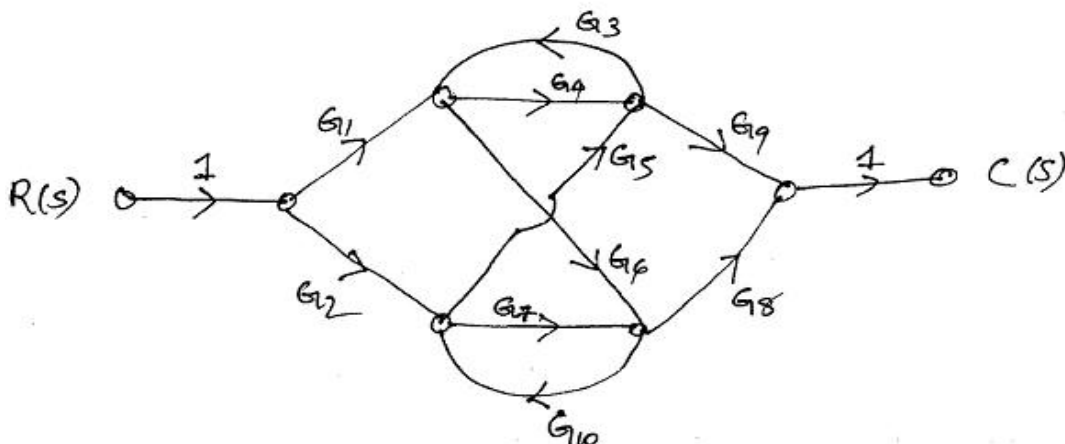
- 1 Give the advantages and disadvantages of feedback. 3
- 2 What is the transfer function of a synchro error detector assuming small variations in the angular difference between the rotor positions of transmitter and receiver? 2
- 3 What are the standard inputs given to a system to obtain the time response. 3
- 4 Write the transfer function of a PID controller. 2
- 5 State the magnitude and phase condition for the single loop system given below. 3



- 6 Draw the locations of the poles and zeroes in the s-plane for a lead compensator. 2
- 7 What are state variables? 2
- 8 Define observability of a system. 2
- 9 Distinguish between continuous time systems and discrete-time systems. 3
- 10 What is the z-transform of a sampled unit step function delayed by T seconds. The sampling time is T seconds. 3

PART – B (50 Marks)

- 11 Find the transfer function $c(s) / R(s)$ for the signal flow graph shown below. 10



- 2 -

12 Draw the root locus plot for a system for which the open loop transfer function is

$$G(S)H(S) = \frac{K}{S(S+4)(S+5)}$$

Find the value of K for which the system becomes unstable. 10

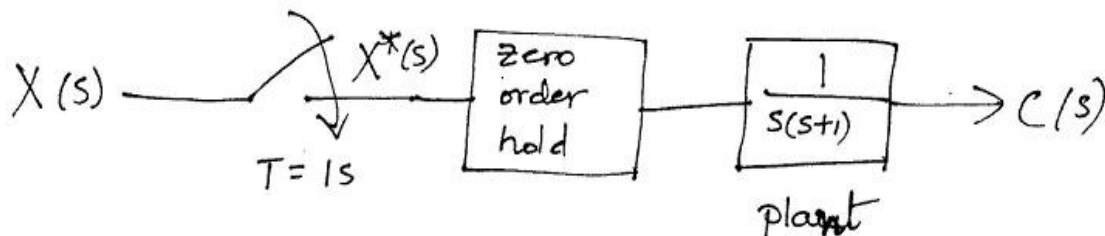
13 Draw the Bode magnitude and phase plots for a system given by

$$G(S)H(S) = \frac{20}{S(S+2)(S+10)}$$

Find the gain and phase margins from the Bode plot. 10

14 Obtain the state variable representation of a series R-L-C network connected to a voltage source. 10

15 Find the pulse transfer function of the system shown below. 10



16 Obtain the unit step response of a first order system and also show the figures of the output and error as functions of time. 10

17 Write a short note on :

- Correlation between time domain and frequency domain
- A C servomotor

10

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I - Semester (New) (Main) Examination, November / December 2016

Subject : Digital System Design with Verilog HDL**Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Explain System tasks and Compiler directives in Verilog. (2)
- 2 Explain representation of numbers in Verilog. (2)
- 3 Write a Verilog module to describe 2 bit comparator in data flow modeling. (3)
- 4 What is RTL code with example? (2)
- 5 Explain difference between mealy and moore model. (3)
- 6 Define ASM blocks and explain with example. (3)
- 7 Write a Verilog model for JK Flip Flop. (2)
- 8 Explain analyze procedure of asynchronous sequential circuits. (2)
- 9 Explain Race conditions with example. (3)
- 10 Draw simplified architecture of FPGA and CPLD with applications. (3)

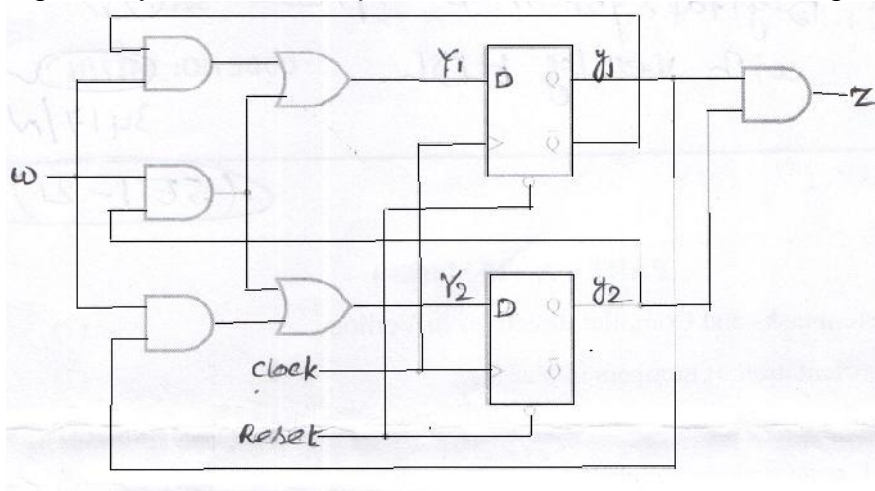
PART – B (50 Marks)

- 11 (a) Explain generated block with example.
(b) Write Verilog behavioural model to model 8 bit ALU with 8 instructions with test bench. Draw input and output waveforms.
- 12 Design and write Verilog code for modulo 8 counter using sequential approach use T flip flop as memory element.
- 13 (a) Differentiate between latch and Flip flop.
(b) Design sequential circuit for given state table and write Verilog code in behavioural modeling.

	X	
	0	1
A	B/O	E/O
B	A/I	C/I
C	B/O	C/I
D	C/O	E/O
E	D/I	A/O

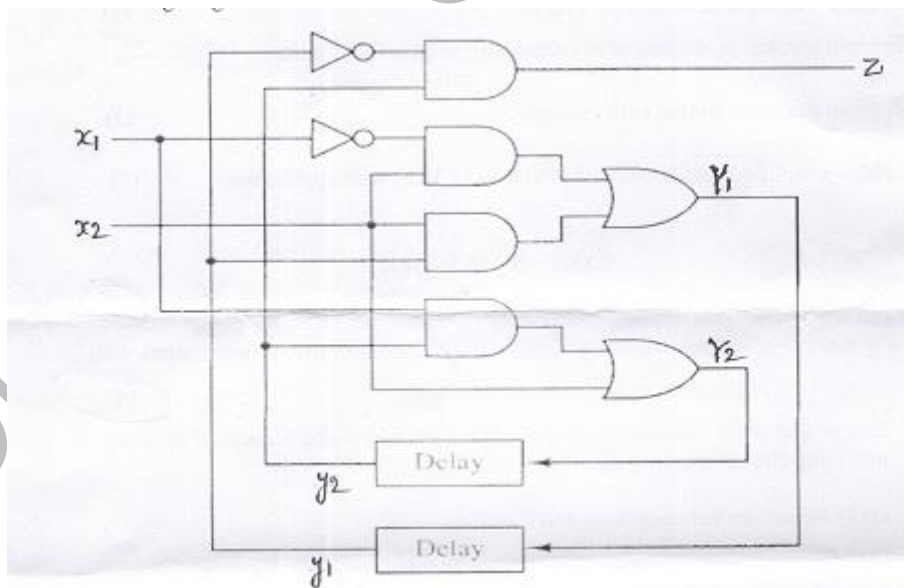
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14 Analyze the given Synchronous sequential Circuit and write its Verilog code.



15 Design Vending machine controller and Implement its Verilog code.

16 Analyze given asynchronous sequential circuit and obtain its state table and timing diagram.



17 Write short notes on the following:

- Multway Branching
- Programmable Logic Devices (PLDs)
- Memory Devices

FACULTY OF ENGINEERING**B.E. 3/4 (AE) I-Semester (Old) Examination, December 2016****Subject : Automotive Transmission****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 What are the different types of gear boxes used in an automobile system?
- 2 What is the importance of gear ratio in vehicles?
- 3 What are the advantages of using a spur gear?
- 4 What is an overdrive?
- 5 How do you reduce the drag torque in fluid coupling?
- 6 What is the principle of torque converter?
- 7 Explain briefly about automatic and semi-automatic transmission.
- 8 How do you control the gears automatically?
- 9 What are the advantages and limitations of elective drive?
- 10 What are the disadvantages of hydrostatic drive?

PART – B (50 Marks)

- | | | |
|-------|--|---|
| 11 a) | Describe the working of a synchromesh gear box with the help of a sketch. | 7 |
| b) | What are the various materials in which a gear box is made. | 3 |
| 12 a) | Describe in detail various types of gear selector mechanism used in automobiles. | 5 |
| b) | What is a transfer box and where it is used? | 5 |
| 13 a) | Explain torque capacity in fluid coupling. | 4 |
| b) | Explain the construction of white hydrotorque drive. | 6 |
| 14 | Explain with the help of a diagram the principle of any type of automatic transmission. Describe also briefly the method of control employed in this type of transmission. | |
| 15 a) | Explain the principle of hydrostatic drive. | 5 |
| b) | Principle of Ward Leonard system of control. | 5 |
| 16 a) | Explain Cotal and Wilson gearbox. | 7 |
| b) | Explain briefly automatic overdrive. | 3 |
| 17 a) | Explain the necessity of gearbox for a vehicle using performance curve analysis. | 5 |
| b) | Performance characteristics of torque converter. | 5 |

FACULTY OF ENGINEERING**B.E. 3/4 (AE) I – Semester (New) (Main) Examination, November / December 2016****Subject: Automotive Transmission****Time: 3 Hours****Max.Marks: 75**

- Note:**
- Answer all questions from Part A. Answer any five questions from Part B.
 - Answer to the questions of Part-A must be at one place and in the same order as they occur in the question paper.
 - Candidate is advised not to attempt more questions than required.
 - Missing data if any may suitably be assumed.
 - Use of data of book is permitted.
 - Unless otherwise stated $X = 1.4$, $C_p = 1.005$ kJ/kg.

PART – A (25 Marks)

- What are the advantages of multi plate clutch over single plate clutch?
- What is the purpose of lubrication of gears in gear box?
- What is meant by automatic over drive?
- Draw the sketch of planetary gear box and mentioned parts of it.
- Define slip in fluid coupling.
- Explain the working principle of multi stage torque converter.
- Explain the working principle of automatic control of gears.
- What are the drawbacks associated with conventional transmission?
- Draw performance characteristic curves for electrical drive.
- Explain the working principle of hydro static drive system.

PART – B (5x10 = 50 Marks)

- What are various speed synchronizing devices for gear box?
 - Design a simple gear box (assume your own data).
- Explain two methods that how gear ratios are determined in planetary gear box.
- Explain the constructional and operational details of typical hydraulic transmission line.
- Explain the working principle of automatic transmission of Chevrolet.
- Explain the working principle of a typical hydrostatic drive.
- Write short notes on fluid coupling.
- What are the various performance characteristics of electrical drive.
