

FACULTY OF ENGINEERING**B. E. ³/₄ (Civil/CSE/IT) I – Semester (Backlog) Examination, December 2019****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 micro Economics. 3
2. What is demand Function. 2
3. Write about Diseconomies of scale. 3
4. Differentiate between Fixed Cost and variable Cost. 2
5. Write any three assumptions of break-even Analysis. 3
6. Define monopoly. 2
7. What is fixed capital? 3
8. State the payback method. 2
9. Write any two rules of Accountancy. 3
10. What is ledger? 2

PART – B (5 x 10 = 50 Marks)

11. Define Managerial Economics and its usefulness to engineers. 10
12. Calculate P/V Ratio, Break-even point and sales to earn a desired profit Rs.30,000 from the following information. Sales Rs.4,00,000 variable cost Rs.3,00,000 fixed cost Rs.1,00,000. 10
13. Write short notes on
 - a) Sources of capital 5
 - b) Concept of accounting. 5
14. Calculate the Average Rate of Return from the following particulars.
Cost of proposal Rs.2,50,000. Cash flow after taxes and depreciation as follows. Rate of Return. 12%. 10

Year	1	2	3	4
Rs.	90,000	1,60,000	1,20,000	70,000

15. From the following Trial Balance of Vikas foundry works, prepare Trading account and profit and Loss account also a balance sheet for the year ending 31-03-2015. 10

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Trial Balance as on 31-03-2015

Debit Balance	Rs.	Credit Balance	Rs.
Electricity	14,000	Interest	16,000
Land	1,40,000	Discount	6,000
Interest	16,000	Sales	8,00,000
Wages	50,000	Returns	10,000
Opening stock	20,000	Sundry Creditors	60,000
Rent	24,000	Capital	3,20,000
Purchases	3,00,000	Bills Payable	15,000
Office Expenses	30,000		
Building	4,00,000		
Salaries	90,000		
Power, gas and water	30,000		
Returns	20,000		
Furniture	15,000		
Sundry Debtors	60,000		
	12,09,000		12,09,000

- Adjustments: 1) outstanding salaries Rs.10,000 2) Closing Stock Rs.80,000
 3) Depreciate Building @ 10% P.A. 4) Interest Received in advance of Rs.2,000
 5) Write off Bad debts Rs.10,000.

16. Write about:

- a) External Economics of Scale.
 b) Techniques of demand forecasting.

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5

17. Journalize the following transactions.

2014 January

- 1) ABC firm command business with Rs.40,000
 2) Deposited into bank. Rs.30,000
 3) Bought goods from Kamal Rs.48,000
 4) Sold goods worth Rs.60,000 by Cash
 5) Paid Rent Rs.4,000
 6) Sold goods worth Rs.5,00,000 to Suresh
 7) Received Commission Rs.2,000.

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FACULTY OF ENGINEERINGB.E. $\frac{3}{4}$ (EEE/Inst.) I – Semester (Backlog) Examination, December 2019

Subject : Linear Control Systems

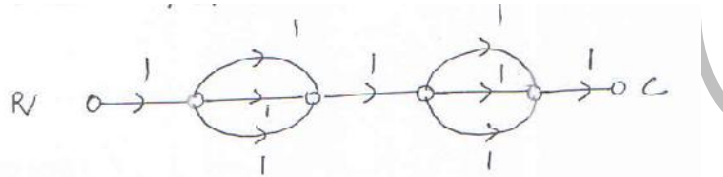
Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A & answer any five questions from Part - B.

PART – A (25 Marks)

1. What is D' Alemberts law? How is it related with Kirchoff's law?
2. Find C/R



3. Obtain the transfer function of PID Controller?
4. The transfer function of a system is

$$\frac{C(S)}{R(S)} = \frac{100}{S^2 + 10S + 100}$$
 Find (a) Resonant frequency
(b) Band Width
5. The No. of poles in RHS of S-Plane for the system whose characteristics equation is

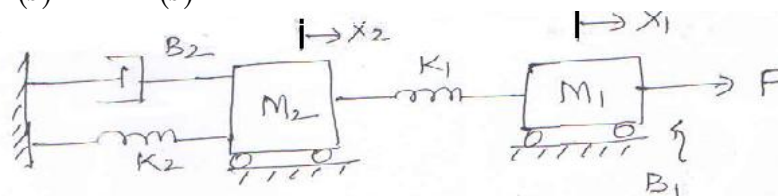
$$S^4 + 2S^3 + 3S^2 + 4S + 5$$
6. What is the expression for finding the Maximum phase lead contributed by lead compensator, and the corresponding frequency?
7. Compute e^{At}

$$A = \begin{bmatrix} 0 & 1 \\ -3 & -4 \end{bmatrix}$$
8. What is the condition for stability for discrete time systems?
9. The forward path transfer function of unity feedback system has 3 poles and one zero. What are the angles of asymptotes?
10. The response of a system for step input is $C(t) = 1 - e^{-2t}$
What the value of steady state error?

PART – B (50 Marks)

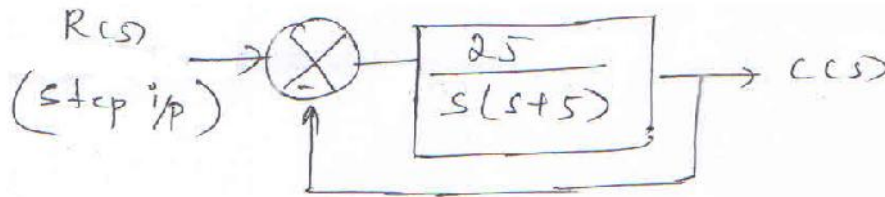
11. Find the Transfer functions

$$\frac{X_1(s)}{F(s)} \text{ and } \frac{X_2(s)}{F(s)}$$



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12. Find all time domain specifications for the system shown in figure



13. Draw the root locus of the system having open loop transfer function.

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

Find 'K' when damping ratio ζ is 0.5 from the plot?

14. Draw the Nyquist plot and determine the stability.

$$G(s) = \frac{s+2}{(s+1)(s-1)}$$

Verify the stability using R-H criteria.

15. Obtain the phase variable form of state model for the transfer function representation.

$$\frac{Y(s)}{X(s)} = \frac{20(s^2 + 2s + 4)}{s^3 + 3s^2 + 6s + 18}$$

16. Determine stability using Jury's stability criteria

$$Z^4 + 3Z^3 + 2Z^2 + 4Z + 6 = 0$$

17. Write short notes

- Rules of Block diagram reductions.
- Design of phase lag compensator.

FACULTY OF ENGINEERING

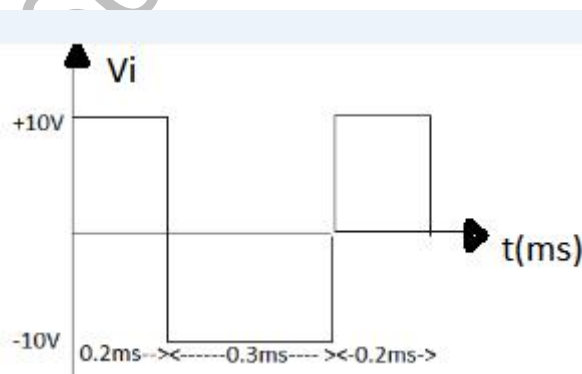
B.E. 3/4 (ECE) I – Semester (Backlog) Examination, December 2019

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)**

- Name the circuit which uses the following components
 - Low pass RC
 - Requires diodes and resistors only
 - Reduces the amplitude of the signal
 - Requires diodes, resistors and capacitors
- Sketch the step and pulse response of LPRC circuit.
- Compare the performance of series clipper with shunt clipper.
- Draw the circuit which transmits that part of a sine wave which is below +6 volts.
- With reference to the binary circuit, explain the role of the commutating capacitors.
- What are different triggering methods in Binary Circuit?
- Define Transmission error and explain its significance.
- Explain fan-out of the gate with an example.
- What are the advantages of MOS families over bipolar families?
- Give the design of AND gate using DTL logic and explain the operation.

PART – B (50 Marks)

- The input wave form shown in Fig. is applied to a low pass RC circuit at $t = 0$. Sketch The O/P voltage from $t = 0$ to $t = 1$ msec. The low pass RC circuit uses $R = 100$ and $C = 0.1 \mu F$. The input signal source resistance is $1k$. Assume initial capacitor voltage zero. (10M)



- For a CE circuit $V_{CC} = 10V$, $R_C = 1K$, $I_B = 0.2A$. Determine
 - The value of h_{FE} (min) for saturation to occur.
 - If R_C is changed to 220 , will the transistor be saturated? (5M)
 - A symmetrical 50 Hz square wave whose peak to peak excursions are $\pm 100 V$ with respect to ground is to be positively clamped at 25 V. Draw the necessary circuit diagram and output waveform for this purpose. (5M)
- Draw the circuit of Schmitt Trigger and derive expressions for UTP and LTP. (5M)
 - Differentiate between bi stable, mono stable and a stable multi vibrators. (5M)

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14. a) Discuss the various methods of improving sweep linearity in voltage time base generators and derive the expression for sweep speed error in each case. (5M)
b) Draw the circuit diagram of a Boot strap voltage time base generator and explain its operation with waveforms. Derive the expression for its sweep amplitude, sweep period and retrace interval and recovery time. (5M)
15. a) Explain the operation of 3-input CMOS NAND gate circuit with truth table . (6M)
b) Compare different Logic Families. (4M)
16. a) Implement the function $F = [AB + ABD]$ using CMOS logic family. (5M)
b) Give advantage of open collector circuit and where it is used. (5M)
17. Write short notes on (10M)
- a) Transistor switching time.
 - b) SCR
 - c) ECL Logic

FACULTY OF ENGINEERING
B.E. 3/4 (E.C.E) I-Semester (Old) Examination, December 2019

Subject: Microprocessors and Microcontrollers

Time: 3 hours

Max. Marks: 75

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

PART – A (25 Marks)

- 1 Differentiate between maximum and minimum modes of operation. [2]
- 2 How are segment register used to form a 20 bit address? [3]
- 3 Write an ALP in 8086 to add two packed decimal numbers with the sum exceeding 8 bits. [3]
- 4 Name the dedicated interrupt vectors of 8086 with their type numbers. [2]
- 5 What is meant by handshaking mode in 8255 PPI? [2]
- 6 Sketch the organization of on chip RAM in 8051 showing the address locations. [3]
- 7 Write a program using 8051 to
 - a) Load the accumulator with the value 55H, and
 - b) Complement the ACC 700 times. [3]
8. Write the function of each bit in SCON register. [2]
9. What is indexed addressing mode of 8051? Illustrate with an example. [2]
10. Interface an 8-bit DAC to 8051 and write a program to generate triangular Wave. [3]

PART – B (50 Marks)

11. a) Explain the function of the following 8086 instructions with an example. [5]
 - i) XLAT ii) IN iii) INT iv) DAA v) LDS
 b) Draw the 8086 maximum mode block diagram and explain the significance of various signals. [5]
12. a) Explain the following addressing modes of 8086 with an example. [5]
 - i) Direct ii) Register indirect iii) Relative based indexed
 b) Write an ALP of 8086 to find whether the given string is a palindrome or not. [5]
13. a) Draw the interrupt vector table of 8086 and explain. [4]
 b) Explain the operation of 8257 DMA controller. [6]
14. a) Draw the port 0 structure of 8051 and explain. How is it different from other ports of 8051? [5]
 b) Write an ALP for 8051 to read 10 bytes of data from internal RAM starting at 45H and save the data in external RAM starting at 8070H. Assume suitable data. [5]
15. a) Write an ALP to generate a square wave of 10 KHz frequency at port Pin P1.2 using Timer 1 of 8051. [5]
 b) What are the steps required for programming the 8051 to transfer data serially. [5]
16. a) Interface ADC808 converter with 8051 and write a program to read the data from the converter. List all the conversion steps. [5]
 b) Show the interface design of an 8031-based system with 8K bytes of data ROM. [5]
17. Write short notes on any two: [5 x 2= 10]
 - a) 8086 physical memory organization.
 - b) 8251 USART
 - c) LCD interfacing with 8051

FACULTY OF ENGINEERING**B.E. ¾ (AE) I - Semester (Backlog) Examination, December 2019****Subject: Automotive Transmission****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part A and any five questions from Part B****PART – A (10 x 2.5 = 25 Marks)**

1. How clutches are classified?
2. Draw the layout of sliding mesh gear box.
3. How are different speeds obtained in a planetary gear box?
4. Write the advantages of planetary gear box.
5. Differentiate clearly between a torque converter and a fluid coupling?
6. What is function of the reaction member in the torque converter?
7. Write the advantages of automatic transmission system.
8. State the advantages of over drive system.
9. What are types of hydrostatic drive?
10. List the advantages and limitations of electric drive.

PART – B (5 x 10 = 50 Marks)

11. Describe in detail, the construction and working of a single plate diaphragm spring clutch with a neat sketch.
12. a) Explain the working of a 4 forward and 1 reverse speed constant mesh gear box with neat sketch and Draw the power flow diagram in all gears.
b) Discuss the advantages and disadvantages of the centrifugal clutch over clutch employing helical springs.
13. Describe with a neat sketch the construction and working principle of a Multistage and poly phase Torque converter.
14. (a) Describe with a neat sketch the constructional details of a fluid coupling and principle of operation in detail.
(b) Explain the performance characteristics of the Torque converter.
15. a) Explain Cotal electromagnetic transmission with neat sketch.
b) Explain epicyclic gear train with neat sketch.
16. Describe about the Janny hydrostatic drive with respect to construction, working and merits and demerits.
17. a) Explain briefly modern electric drive for buses.
b) What are the advantages and disadvantages of Ward Leonard control system?

FACULTY OF ENGINEERING**B.E. (Civil) V – Semester (CBCS) (Main & Backlog) Examination, December 2019****Subject: Environmental Engineering****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (10x2 = 20 Marks)**

- 1 Name the most important considerations to be made to supply protected water.
- 2 Mention three valves with their functions and location.
- 3 What is the difference between sedimentation and coagulation?
- 4 Explain loss of head and negative head in rapid sand filter. What is the effect of excessive negative head?
- 5 Differentiate between sewerage and sewage.
- 6 Find ultimate BOD for a sewerage having 5 day BOD at 20°C as 250 mg/L. Assume $K = 0.10$ at 20°C.
- 7 What is the difference between primary and secondary treatment of sewerage.
- 8 State the significant differences between a trickling filter and activated sludge process.
- 9 What is 'Sludge Volume Index'?
- 10 What are the different sources of solid waste generation?

PART – B (5x10 = 50 Marks)

- 11
 - a) Distinguish between surface sources and underground sources of water from quality and quantity considerations. 5
 - b) What are intakes? List the different types of intakes and explain any one type with a neat sketch. 5
- 12
 - a) Design a rectangular sedimentation tank to treat 1.80 MLD of water. Check for its over flow rate. 5
 - b) Distinguish between slow sand filter and rapid sand filter. 5
- 13
 - a) Mention the advantages and disadvantages of various systems of sewerage. 5
 - b) Calculate the diameter of circular sewer laid at a slope of 1 in 500 when running half full with a velocity of 200 mm/s and $N = 0.012$ in Manning's formula. 5
- 14
 - a) Sketch typical flow diagram of various operations / processes employed in conventional sewage treatment and mention the functions of each. 5
 - b) Give flow diagram of ASP and briefly explain working of ASP. 5
- 15
 - a) State the methods of sludge disposal and explain the functioning of an anaerobic digester. 5
 - b) Design a septic tank for a student hostel of 150 users. Draw neat sketches. Assume the necessary data. 5
- 16
 - a) What are the different methods of disposal of solid waste. 5
 - b) Differentiate between plain sedimentation tank and septic tank. 5
- 17 Write short notes on the following:
 - a) Removal of hardness 5
 - b) Attached and suspended growth processes. 5

FACULTY OF ENGINEERING**B.E. (ECE) V - Semester (CBCS) (Main & Backlog) Examination, December 2019****Subject : Digital System Design with Verilog HDL****Time : 3 hours****Max. Marks : 70****Note: Answer all questions from Part-A. Answer any Five questions from Part-B.****PART – A (20 Marks)**

- 1 Discuss any two system tasks used in Verilog.
- 2 Explain procedural assignment statement with example.
- 3 Illustrate the advantage of generate blocks.
- 4 Define stimulus block.
- 5 Write Verilog code for T-FF.
- 6 Explain the need for state minimization techniques.
- 7 List the elements of ASM chart.
- 8 Draw ASM chart for simple vending machine.
- 9 List few CAD tool vendors for circuit design.
- 10 Draw simple architecture of FPGA.

PART – B (50 Marks)

- | | |
|--|----|
| 11 With neat diagrams, explain BCD adder and write Verilog code for it. | 10 |
| 12 a) Explain the basic concepts of Static Timing Analysis. | 5 |
| b) Write Verilog code for 4:1 Multiplexer (using 2 : 1) in gate level. | 5 |
| 13 a) Design Moore type FSM for Serial Adder. | 5 |
| b) Write Verilog code for Moore type FSM for Serial Adder and design a stimulus block. | 5 |
| 14 With neat ASM chart and Verilog code, explain Binary multiplier. | 10 |
| 15 a) Realize the function $f = (6, 7, 9, 13, 15)$ using PLA. | 5 |
| b) Draw and explain FPGA design flow. | 5 |
| 16 a) Explain Data types used in Verilog with examples. | 5 |
| b) Explain parallel and generate blocks. | 5 |
| 17 Write short note on : | |
| a) Moore Vs Melay FSM | 3 |
| b) Hazards | 4 |
| c) Full-custom design | 3 |

FACULTY OF ENGINEERING**B.E. (M/P) V – Semester (CBCS) (Main & Backlog) Examination, December 2019****Subject: CAD / CAM****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****PART – A (10x2 = 20 Marks)**

- 1 What do you mean by Design Criteria?
- 2 Differentiate parametric and non-parametric representation of curves.
- 3 Write transformation matrix for rotation and scaling.
- 4 What is COONS surface?
- 5 Expand the terms a) IGES, b) STEP and c) STL
- 6 What do you mean by canned cycle?
- 7 Classify various types of APT statements.
- 8 Sketch polar configuration robot.
- 9 Define CAPP.
- 10 What is reverse Engineering?

PART – B (5x10 = 50 Marks)

- 11 a) What do you mean by interpolation and approximation of curves? Explain with sketch. 5
- b) A cubic Bezier curve is described by four control points, $P_0(0,0)$, $P_1(2,1)$, $P_2(5,2)$ and $P_3(6,1)$. Find the tangent to the curve at $u = 0.25$. 5
- 12 a) What do you mean by reflection transformation? Write the transformation matrix for reflection about three axes. 5
- b) A line defined by two endpoints $A(1, 0)$, $B(2, 5)$ is rotated by 30° about
 - a) Origin and b) about the point $(2, 5)$. Determine the coordinates of transformed line. 5
- 13 a) Discuss the structure of relational and hierarchical database. 5
- b) Explain about STL and STEP file formats. 5
- 14 a) Explain in brief the following features of an industrial robot.
 - i) Work Volume,
 - ii) Payload,
 - iii) Precision on movement,
 - iv) Accuracy and repeatability and
 - v) Resolution. 5
- b) What is computer aided quality control? Explain the working of scanning laser beam device with sketch. 5

15 Write an APT part program for the profile shown in fig 1. The processing parameters are:

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- a) feed rate is 5.39 inches per minute;
- b) spindle speed is 573 revolutions per minute;
- c) a coolant is to be used to flush the chips;
- d) the cutter diameter is to be 0.5 inches, and
- e) the tool home position is (0, -1, 0).

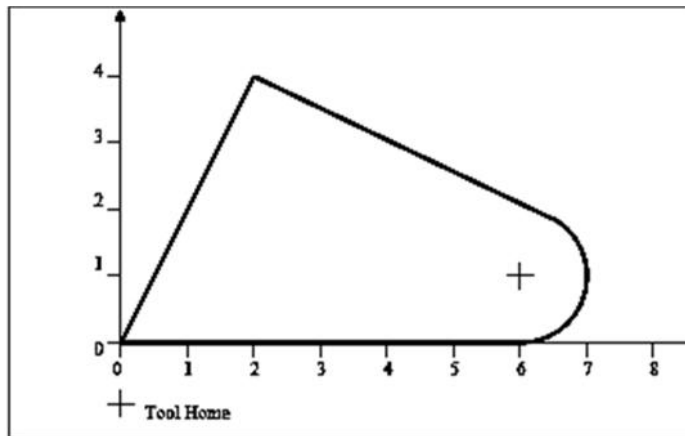


Fig. 1

- 16 a) Enumerate the differences between retrieval CAPP and generative CAPP system. 5
- b) Explain the various components of FMS. 5
- 17 a) Explain the methodology of rapid prototyping. 5
- b) Write a short note on: 5
 - a) FANUC Controller
 - b) End effectors in Robots

FACULTY OF ENGINEERING

B. E. (Mech.) V – Sem. (CBCS)(Main & Backlog) Examination, December 2019

Subject: Automotive Transmission

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions of Part – A. Answer any five questions from Part-B.

PART – A (10x2=20 Marks)

- 1 Mention the applications of single plate, multiplate, centrifugal and cone clutch in automotive vehicles.
- 2 Sketch single plate clutch assembly.
- 3 Give the gear box troubles and their causes.
- 4 What are the usual gear ratios for second gear and fourth gear?
- 5 What is the torque converter? In what respect is it different from a fluid flywheel?
- 6 Define over drive and list out the components of over drive.
- 7 What are the relative merits of automatic transmission when compared to conventional transmission?
- 8 Why is the fluid flywheel provided in automatic transmission?
- 9 What are the advantages of Electrical drives in gear box.
- 10 List out the merits and demerits of hydrostatic drive.

PART –B (10 x 5 = 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 Explain the working principle of sliding mesh gear box with neat sketch.
- 14 (a) What are the disadvantages of automatic transmission?
(b) Explain the principle of continuously variable transmission (CVT).
- 15 Explain briefly construction and working of Jenny Hydrostatic drive.
- 16 With a circuit-diagram explain the operation of electric drive for city buses.
- 17 Explain the following
 - (a) Clutch release bearing
 - (b) Free Wheel
 - (c) Planetary gear box

FACULTY OF ENGINEERING**B.E. (CSE) V – Semester (CBCS) (Main & Backlog) Examination, December 2019****Subject: Managerial Economics and Accountancy****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****PART – A (10x2 = 20 Marks)**

- 1 Define Managerial Economics.
- 2 What is Demand Function.
- 3 Define Case Study.
- 4 Distinguish Explicit and Implicit Costs.
- 5 Correlate AR and MR.
- 6 Define Current Ratio.
- 7 What is Profitability Index?
- 8 What is meant by Accounting Cycle?
- 9 State Fixed Capital.
- 10 What do you mean by Petty Cash Book?

PART – B (5x10 = 50 Marks)

- 11 Explain the fundamental concepts of Managerial Economics.
- 12 Define Elasticity of Demand. Explain various kinds of Price Elasticity of Demand.
- 13 Discuss the Law of Variable Proportions.
- 14 What is meant by Monopoly? Explain. How is determined Price under Monopoly.
- 15 From the following information, calculate
 - a) BEP units and sales.
 - b) P/V Ratio.
 - c) Margin of Safety.

Sales = 10,000 units
 SP = ₹ 30 per unit
 VC = ₹ 20 per unit
 Fixed Cost = ₹ 50,000

- 16 The proposals in respect of the following two projects are to be examined using
 1. payback period method
 2. ARR method
 Initial investment for both projects ₹ 50,000
 Estimated cash flows are

Year	Project 1 (Rs.)	Project 2 (Rs.)
1	10,000	30,000
2	20,000	30,000
3	30,000	30,000
4	40,000	30,000
5	50,000	30,000

- 17 From the following Trial balance of John Traders, prepare final accounts for the year ending 31.03.2018.

Trial Balance

Debit Balances	Amount (₹)	Credit Balances	Amount (₹)
Opening Stock	8,000	Capital	40,000
Purchases	7,400	Creditors	4,000
Wages	2,000	Bills payable	10,000
Carriage	1,000	Discount	3,800
Rent	1,600	Sales	16,000
Salaries	1,200	Overdraft	4,000
Discount	800		
Advertisement	1,200		
Customs Duties	1,000		
Factory Insurance	600		
Machinery	20,000		
Debtors	14,000		
Furniture	16,000		
Post Charges	1,200		
Bad debts	1,800		
Total	77,800		77,800

Adjustments

- | | |
|------------------------------|-------|
| 1. Value of closing stock | 9,000 |
| 2. Prepaid wages | 400 |
| 3. Outstanding rent | 400 |
| 4. Depreciation on machinery | 10% |
| 5. Depreciation on furniture | 5% |
