FACULTY OF Engineering

BE (Civil) V-Semester (CBCS) (Backlog) Examination, November 2020

Subject: Environmental Engineering

Time: 2 Hours   **Max.Marks:70**

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. List the different population forecasting methods.

2. What are joints? Write any two requirements of joints.

3. What are screens? List the different types of screens.

4. The population of the city is 1 lakh and the percapita demand is 130litres/day. Calculate the total area of filters if the rate of filtration is 3500 liters/hour/sq.m.

5. What are the various physical tests done on sewage?

6. Define the term 'time of concentration'.

7. What is sampling of sewage?

8. List the various impurities present in waste water and the treatment processes used for their removal.

9. Write about the recovery of refuse?

10. What are septic tanks?

PART-B

Note : Answer any Four Questions   **(4 x 15 = 60 Marks)**

11 (a) List and explain in detail the various factors affecting the water demand.
(b) From a reservoir 3m deep and maximum water level 30m, water is pumped to an elevated reservoir at 75m at a constant rate of 0.25 cumecs by a pipe whose diameter is 0.61m and the distance is 1500m. Determine the water horse power of the pump. Neglect minor losses and take f = 0.01.

12 (a) Design a sedimentation tank for a water works which supplies 1.4×10^6 lit/day water to the town. The sedimentation period is 5 hours, the velocity of flow is 12 cm/min, depth of water in the tank is 4 m. Assume an allowance for sludge to be 80cm.
(b) What is permanent hardness? Discuss any two methods of removal of permanent hardness.

13 (a) Determine the velocity of flow in a circular sewer of diameter 150 cm running one half full, laid at a slope of 1 in 550. Also determine the discharge flowing through the sewer. Assume N = 0.012 in Manning's formula.
(b) What are storm water relief works? Discuss any two types of storm water relief works.

14. Design a circular sewage sedimentation tank for a town having population of 50,000. The average water demand is 150 liters/ capita /day. Assume that 80% water reaches at the treatment unit and the maximum demand is 2.7 times the average demand.

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15. (a) Explain the working of imhoff tanks with a neat sketch.

(b) Design a sludge digestion tank with the following data. (i) average flow of sewage = 16 X10^6 liters/day. (ii) total suspended solids in raw sewage = 350 mg/liter. (iii) volatile suspended solids = 250 mg/liter. (iv) moisture content of the digested sludge = 87%. Assume data not given suitably.

16 (a) Discuss in detail the various methods of disposal of solid waste.

(b) What is an oxidation ditch? Explain its construction and working with a sketch.

17. Write short notes on
(a) Hardy Cross Method.

(b) Pressure filters.

(c) Method of determination of B.O.D.

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FACULTY OF ENGINEERING

B.E. (ECE) V - Semester (CBCS) (Backlog) Examination, Oct / Nov 2020

Subject : Digital System Design with Verilog HDL

Time: 2 Hours   **Max.Marks:70**

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. Discuss any two compiler directives used in Verilog.

2 Explain continuous assignment statement with example.

3 Differentiate between sequential and parallel blocks.

4 Define logic synthesis.

5 Write Verilog code for D-FF.

6 Explain the need for state minimization techniques.

7 Explain ASM blocks.

8 Explain types of hazards with examples.

9 List few CAD tools used in circuit design.

10 Draw simple architecture of CPLD.

PART-B

**Note : Answer any Four Questions**   **(4 x 15 = 60 Marks)**

11 a) Write Verilog code for 4-bit Binary Adder.

   b) Write Verilog code for 8-bit comparator in dataflow modeling.

12 With examples for each, explain all the types of conditional statements.

13 Design a mod-8 counter using sequential circuit approach with JK-FFs and write its Verilog code.

14 a) With neat diagram explain race condition.
   b) Draw ASM chart for the Arbiter and write its Verilog code.

15 a) Realize the function f = Σ(5, 7, 10, 14, 15) using PLA.
   b) Differentiate among various types of ASIC available.

16 a) Write short notes on dater flow modeling and explain with a suitable example.

   b) Differentiate between Tasks and Functions.

17 Write short note on :
   a) Latch Vs Flip-Flop

   b) Mealy machine design

   c) CAD today for combinational circuit design

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FACULTY OF ENGINEERING

B.E. (M/P) V - Semester (CBCS) (Backlog) Examination, Oct/Nov 2020

Subject :CAD/CAM

Time: 2 Hours   **Max.Marks:70**

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. Define CAD and CAM?
2. What are synthetic curves? Give some applications.
3. What do you mean by concatenation of transformations?
4. Explain with neat sketch the surface of revolution and tabulated cylinder.
5. Explain feature based and parametric modelling concept in CAD.
6. Explain STL file format in CAD.
7. Discuss the advantages and disadvantage in DNC machining system?
8. What is machining centre. Explain ATC in it.
9. What is the importance of part coding system in manufacturing industry?
10. What is reverse engineering?

PART-B

Note : Answer any Four Questions   **(4 x 15 = 60 Marks)**

11. a) Write the Bernstein Polynomial and any four properties ofBezier curves.
    b) Four vertices of Bezier polygon are Po(1,1), P1(2,3), P2(4,3)
       and P3(3,1). Determine seven points on the Bezier curve.

12. a) Explain B-Rrp and C-Rep approach of solid modeling with examples. Write CSG tree
       for figure 1.
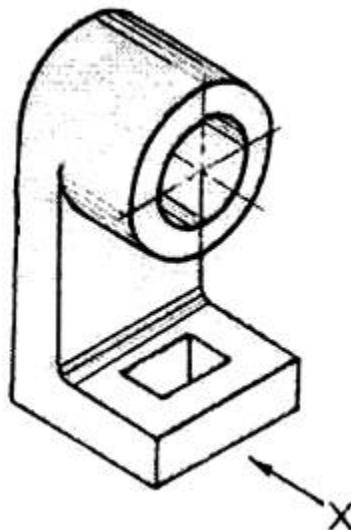
    b) A triangle A(0,0), B(1,1) and C(5,2) is rotated by an angle of 45°about a) the
       origin and b) about point (-1,-1). Find the new co-ordinates of the triangle.

13. a) Write short Notes on i) Mechanical Tolerance, ii) Mass property calculations
       a) What is FEA? What are the basic steps involved in it.

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14. Write an APT part program for the profile shown in figure 2 with cutting speed and feed rate as 850 rpm and 50 mm/min.
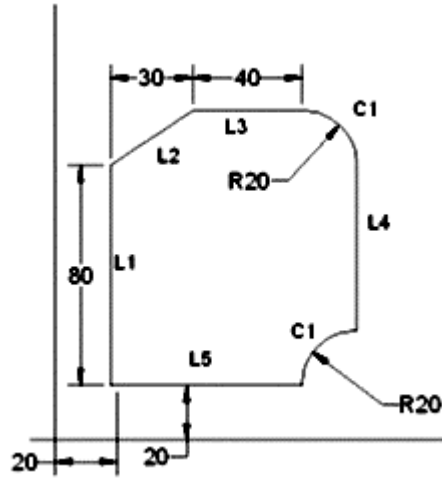
15. a) Explain point to point and contour motion of NC system with sketch?
    b) Discuss various types of control drives in industrial robots.

16. a) Sketch and explain open loop and closed loop types in NC system?
    b) What is ACC and ACO types of adaptive control system? Explain with sketch.

17. a) What is variant and generative type of process planning?
    b) Discuss various types of non-contact inspection.

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FACULTY OF ENGINEERING

B. E. (A.E) (CBCS) V– Semester (Backlog) Examination, Oct / Nov 2020

Subject: Automotive Transmission

Time: 2 Hours   Max.Marks:70

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. List out the types of automotive clutches.

2. Sketch cone clutch assembly.

3. What is a synchronizing device?

4. State different types of gear boxes used in practice.

5. What is the main difference between torque converter and gearbox?

6. What are the merits and demerits of fluid coupling?

7. Why is automatic transmission preferred for commercial vehicles?

8. How are the different speeds obtained in a planetary gear box?

9. What are the advantages of Hydro static drive?

10. List out the merits and demerits of Electrical drives.

PART-B

Note : Answer any Four Questions   **(4 x 15 = 60 Marks)**

11. Explain the working principle of single plate clutch and multi plate clutch and write merits and demerits of one over the other.

12. Explain the working principle of ford T-model gear box with neat sketch.

13. Explain the working principle of synchromesh gear box with neat sketch.

14. (a) What are the disadvantages of continuously variable transmission. (CVT)?
    (b) Sketch Chevrolet drive automatic transmission system.

15. Explain briefly construction and working of typical Hydrostatic drive.

16. (a) Write short notes on Principles of Ward Leonard system of control.
    (b) Draw the circuit-diagram of electric drive for city buses.

17. Explain the following:

    (a) Transfer case.

    (b) Over drive.

    (c) Counter shaft.

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FACULTY OF ENGINEERING

B. E. (CSE) (CBCS) V – Semester (Backlog) Examination, Oct / Nov 2020

Subject: Managerial Economics and Accountancy

Time: 2 Hours   **Max.Marks:70**

PART –A

Note : Answer any Five Questions   **(5x2 = 10 Marks)**

1. Tell about Equi-Marginalism.
2. What do you mean by case study method?
3. Restate Income demand.
4. Define the concept of equilibrium of price.
5. List out the major factors associated with production.
6. Differentiate between Fir and Industry.
7. Spell about ARR method.
8. What do you mean by variable working capital?
9. What is meant by Imprest system?
10. Recall Acid test ratio.

PART-B

Note : Answer any Four Questions   **(4 x 15 = 60 Marks)**

11. Explain the significance of managerial economics.

12. Define Income elasticity of Demand and discuss the types and uses of Income elasticity of demand.

13. Define Working capital. Write about the various sources of working capital.

14. What is meant by the Law of Returns to scale?Explain.

15. 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

16. Explain the method of calculating a) NPV b) IRR. What are the decision criteria of the two methods.

17. From the following balances of Mr.X, prepare the Trading and Profit and Loss account for the year ended 31st March, 2000.

Particulars	Amount (Rs.)
Stock at commencement	20,000
Salaries	25,000
Sundry 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

The closing stock was valued at Rs.18,000.

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FACULTY OF ENGINEERING

B. E. ¾ (Civil/CSE/IT) I – Semester (Backlog) Examination, Oct / Nov 2020

Subject : Managerial Economics and Accountancy

Time: 2 Hours   Max.Marks:75

PART –A

Note : Answer any Seven Questions   **(7 x 3 = 21 Marks)**

1. Define macro Economics

2. What is demand Schedule?

3. Define production function.

4. Write any two economies of scale.

5. Explain break-even Point.

6. Write any two features of perfect market.

7. What is net working Capital?

8. Explain accounting Rate of Return method.

9. What is the significance of accounting?

10. What do you mean by Petty Cash book?

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. Explain the fundamental principles of managerial Economics.

12. Calculate a) P/V Ratio   b) B.E.P   c) Margin of Safety
    Sales Rs.50,000, fixed cost of Rs.10,000 , variable cost Rs.30,000

13. Write short notes on
    a) Assumptions of law of demand.
    b) Different types of Subsidiary books.

14. From the following particulars prepare Net Present value method.
    Cost of proposal Rs.2,50,000 and Rate of Return is 12% P.A.

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

15. Prepare Trading and Profit and Loss account for the year ending 31-12-2013 and
    balance sheet as on that date.

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Trial Balance

Particulars	Debit Rs.	Credit Rs.
Sales		1,25,000
Purchase	78,000	
Sales Returns	2,700	
Purchase Returns		3,600
Discount Received		1,250
Discount allowed	1,850	
Opening Stock	6,675	
Salaries	23,000	
Electricity	1,500	
Rent and Taxes	1,000	
Sunday Expenses	2,350	
Building	50,000	
Machinery	15,000	
Vehicle	10,750	
Debtors	11,420	
Bank overdraft		425
Cash	60	
Creditors		7,750
Capital		55,000
Drawings	5,220	
Bank Loan		16,500
	2,09,525	**2,09,525**

Adjustments:
1) Closing stock Rs.15,000
2) Outstanding salaries Rs.2,000
3) Prepaid Rent and Rates Rs.1,000
4) Provide depreciation on equipment @ 10% P.A.

16. Write about:
   a) Explain the factors influencing demand.
   b) What are the features of perfect competition? Explain.

17. Prepare a bank Reconciliation statement as on 31-12-2016 from the following particulars.
   (i) Bank balance as per pass book Rs.30,000
   (ii) Cheques deposited in bank but not collected till 31-12-2016 Rs.15,000.
   (iii) Cheques amounting to Rs.8,000 were issued before 31-12-2016 but were not presented for payment.
   (iv) Interest on investment Rs.1,000 credited in Pass book only
   (v) Interest on overdraft debited in pass book only Rs.1,500.

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FACULTY OF ENGINEERING

B. E. ¾ (EEE/Inst.) I – Semester (Backlog) Examination, Oct/Nov 2020

Subject: Linear Control Systems

Time: 2 Hours   **Max.Marks:75**

PART –A

Note : Answer any Seven Questions   **(7 x 3 = 21 Marks)**

1. What is the difference between Linear time Invariant and Time variant systems?
2. The Impulse response of a control system is $C(t) = -t\,e^{-t} + 2\,e^{-t}$ Find the transfer function.
3. What are the different types of inputs used for performance analysis of systems?
4. What is the effect of adding poles on stability and transient response?
5. What is the relationship between decibel/decade [db/dec] and decibel/octave [db/oct]?
6. Which compensator is used to reduce steady state error between input and output? Give reasons?
7. What are the properties of state transition matrix?
8. Draw the architecture of digital control system?
9. What is the Kalman's test to check state controllability and State Observability?
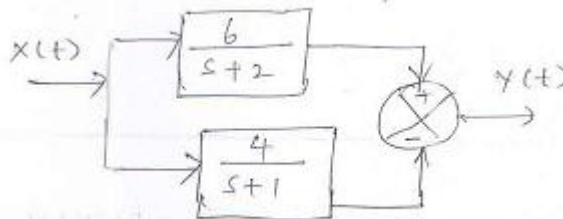10. What is a non-minimum phase function?

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. Show that the system transfer function $\dfrac{Y(S)}{X(S)}$ has a zero in RHS of S-Plane

    Obtain the response Y(t) for unit step input and find the steady state value of the output?

12. Write all the rules of root locus construction and draw the root locus of second order system having Gain 'K'?

13. The open loop transfer function of LTI system is

    $$G(S)H(S) = \frac{K}{(S+1)(S+2)\left(S^2 + 6S + 25\right)}$$

    By applying Routh-Hurwitz Criteria, find the range of 'K' for stability. Find the value of 'K' that will cause sustained oscillations, and the frequency of oscillations in the response?

14. Draw the Bode plot for the system whose open loop transfer function is

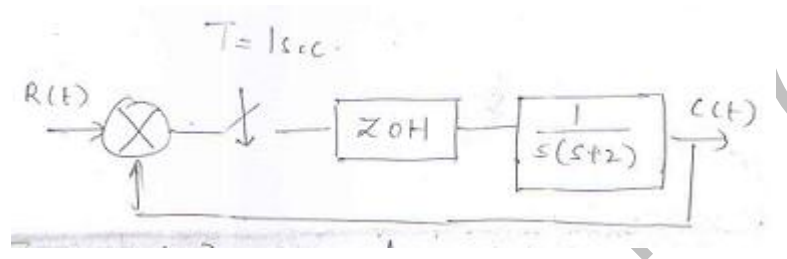 $$G(S) = \frac{50}{S(1 + 0.25\,S)(1 + 0.1S)}$$

    Find from the plot.

    a) w$_{gc}$ b) w$_{pc}$ c) G.M   d) P.M

15. Find the time response of the System described by state model for unit step input

$$\overset{o}{X}(t) = \begin{bmatrix} -1 & 1 \\ 0 & -2 \end{bmatrix} X(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$$

$$X(o) = \begin{bmatrix} -1 \\ 0 \end{bmatrix}$$

16 Find $\dfrac{C(Z)}{R(Z)}$, and find stability using Bilinear transformation?

17. Write short notes on:
    a) Transfer function of Armature controlled D.C. servorotor.
    b) Steady State error and static error constants.

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FACULTY OF ENGINEERING

BE 3/4 (ECE) I Sem. (Backlog) Examination, November 2020

Subject: Pulse & Digital Circuits

Time: 2 Hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions   **(7x3 = 21 Marks)**

1. Derive the expression for % tilt of a High pass RC circuit excited by a symmetrical square wave.
2. Draw the circuit of compensating attenuator and explain?
3. Explain Positive peak clamper circuit.
4. Explain how the transistor used as a switch?
5. What are commutating capacitor? Why are they required?
6. What are the applications of the time base generators?
7. Draw the circuit diagram of tri-state inverter and explain?
8. List the integrated circuit package types.
9. Draw the circuit of CMOS transmission gate and explain?
10. What is meant by interfacing? Why is it required?

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11. a) Show that a Low Pass RC Circuit can function as an integrator circuit?
    b) Derive the square wave response of a low pass RC circuit with suitable waveforms.

12. a) With the help of neat circuit diagram, explain Transistor clipper and draw its characteristics.
    b) State and prove clamping circuit theorem.

13. a) Explain and derive how a voltage to frequency converter works with neat circuit diagram.
    b) What do you understand by hysteresis? What is hysteresis voltage? Explain how hysteresis can be eliminated in a Schmitt trigger.

14. a) Draw and explain two input DTL NAND gate.
    b) Explain the working of a TTL gate with open-collector output.

15. a) Implement the function F=(A(B+C)D)' using CMOS logic family and explain with truth table.
    b) Explain interfacing of TTL driving high voltage CMOS. Illustrate when each is driving the other.

16. In a parallel RLC circuit obtain the transfer function and sketch its voltage and current responses to a step input.

17. Write short notes on
    b) Clamper circuit   b) Figure of merit   c) ECL

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FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I-Semester (Old) Examination, Oct/Nov 2020

Subject : Microprocessor & Microcontroller

Time: 2 Hours   **Max. Marks: 75**

PART –A

Note : Answer any Seven Questions   **(7x3 = 21 Marks)**

1 How does 8086 differentiate between an opcode and instruction data?

2 Write 8086 instructions to mask the most significant four bits of an 8-bit data.

3 What are the functions of the following 8086 pins:
(i) ALE   (ii) READY   (iii) BHE

4 Write the I/O mode control word register format for 8255 in mode 0 configuration with the following specification:
Port A as IN, Port B as IN, Port C lower as OUT and Port C upper as OUT

5 Show the PSW register format in 8051.

6 Explain the following 8051 instructions with syntax format and an example:
(i) SJMP   (ii) MOVX   (iii) CJNE

7 List two reasons why stop bits are used in serial asynchronous communication.

8 Write an ALP of 8051 to store a constant onto RAM locations {30H- 34H} using stack operations.

9 How do you double the baud rate in the 8051?

10 Show the interfacing of 8031-based system with 8K bytes of Program ROM.

PART-B

Note : Answer any Three Questions   **(3 x 18 = 54 Marks)**

11 (a) Discuss the architecture of 8086 microprocessor and explain the operation of BIU and EU.
(b) Draw the Read cycle timing diagram for 8086 in minimum mode operation.

12 (a) Write an ALP for 8086 to find square root of a two digit number (Assume that the number is a perfect square) using assembler directives.
(b) Address 00080H in the interrupt-vector table contains 4A24H, and address 00082H contains 0040H.
(i) To what interrupt type do these locations correspond?
(ii)What is the starting address of the interrupt service procedure?

13 (a) Interface the following memory ICs with 8086:
(i) Two 8 KB EPROMs ending at FFFFFH.
(ii) Two 8KB SRAMs starting from C0000H.
(b) Explain the operational modes of 8254 programmable timer.

14 (a) Sketch the pin configuration of 8051 and explain.
(b) Write an ALP in 8051 to find whether the given string is a palindrome.

15 (a) How do you program 8051 timer in mode 1 to generate a 5ms delay?
(b) Write a program to transfer "YES" Serially at 4800 baud rate continuously.
Show the configuration of all the registers required.

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16 (a) Write a program to interface an LCD to 8051 and display "INDIA".
    (b) Interface a stepper motor to 8051 and write a program to rotate it by
        80-degree in clockwise direction. The motor has a 2-degree step angle.

17 Write short notes on the following:
    (a) 8051 interrupts and 8051 IVT.
    (b) Instruction formats of 8086.

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FACULTY OF ENGINEERING

B.E. 3 /4 (AE) I – Semester (Backlog) Examination, Oct/Nov 2020

Subject: Automotive Transmission

Time: 2 Hours   Max. Marks: 75

PART –A

Note : Answer any Seven Questions   (7x3 = 21 Marks)

1. List out the requirements of transmission system.

2. Draw the layout of content mesh gear box.

3. What is transfer case?

4. Write the advantages of epicyclic gear system.

5. State the principle of torque conversion.

6. What are the limitations of fluid coupling?

7. What are main components of automatic transmission system?

8. What are the main components used in over drive system.

9. Define the hydrostatic drive system.

10. Compare the hydrodynamic drive and electric drive.

PART-B

Note : Answer any Three Questions   (3 x 18 = 54 Marks)

11. Describe in detail, the construction and working of a multi plate coil spring clutch with a neat sketch.

12. (a) Explain the working of a 4 forward and 1 reverse sliding mesh gear box with neat sketch and draw the power flow diagrams in all gears.

    (b) Discuss the advantages and disadvantages of the helical spring's pressure plate over clutch employing diaphragm type pressure plate clutch.

13. Describe with a neat sketch the constructional details of a fluid coupling and principle of operation in detail.

14. (a) Describe with a neat sketch the constructional details of a fluid coupling and principle of operation in detail.

    (b) Sketch and explain the performance characteristics for the above two types of torque Converters.

15. (a) Explain Wilson gear box with a neat sketch.

    (b) Explain for-T model gear box with suitable sketch.

16. Explain briefly the principle of ward Leonard type control system for electric drive.

17. (a) Explain Chevrolet drive system with the help of suitable diagram.

    (b) Describe the method of control employed in the above type of transmission.

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