Code No. 21

FACULTY OF ENGINEERING

B.E. (EE/Inst) II – Semester (Main & Backlog) Examination, May / June 2018

Subject: Electronic Engineering- I

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part-A & Any five Questions From Part-B.

PART – A (20 Marks)

1. Find the ac resistance for a semiconductor diode having a forward bias of 200 mV and reverse saturation current of 1μA at room temperature. 2
2. Calculate the band gap energy of silicon at 450°K 2
3. Define the following terms: 2
   (a)Ripple factor
   (b) Transformer Utilization Factor
4. Draw the circuit of bridge rectifier and explain its advantages over other rectifiers. 2
5. Define α and β for a transistor and derive the relation between them. 2
6. What is Early effect? 2
7. What are three factors that contribute to the thermal instability? 2
8. What are the applications of a CCD ? 2
9. In a JFET, I_D changes from 1.2mA to 1.5mA when V_{GS} is varied from -4.2Vto -4.10V keeping V_{DS} constant. Determine g_m for a given JFET. 2
10. Draw the V-I characteristics of N-channel enhancement MOSFET 2

PART-B(50 Marks)

11. (a) Explain V-I characteristics of p-n junction diode. Discuss the temperature dependence of p n Characteristics. 5+3
    (b) What is Zener breakdown? 2

12. (a) A diode with a forward voltage 0.7 volts is connected as half wave rectifier. The load resistance is 500 ohms and rms ac input is 22 volts. Determine the peak output voltage, peak load current and diode peak inverse voltage. 5
    (b) Draw a neat block diagram of a general purpose CRT and explain function of each block. 5

13. (a) Draw and explain output characteristics of common base configuration for npn transistor. 5
    (b) What is a heat sink? How does it contribute to increase in power dissipation? 5

14. (a) A transistor has its H-parameters given by 1KΩ,50, $2.5x10^{-4}$ and 25μA/V in common emitter configuration using a load resistance of 5KΩ and a source resistance of 1KΩ. Calculate A_V, A_{VS}, A_I, A_{IS}, R_i, and R_o 6
    (b) Draw the block and symbolic representation for UJT. Sketch the V-I characteristics of UJT. 4

..2

15 (a) Draw the structure of a JFET and explain its principle of operation with neat diagrams along with the V-I characteristics. Define pinch-off voltage and mark it on the characteristics. 6

(b) Explain the difference between construction of an enhancement type MOSFET and depletion type MOSFET. 4

16 (a) Explain in detail the working principle of SCR. 5

(b) Explain the characteristics of TRIAC with the help of neat circuit diagram. 5

17. Write any two of the following: 10

a) Junction breakdown in diodes
b) LLC and CLC filters
c) FET as a switch.
d) Tunnel diode

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Code No. 23

FACULTY OF ENGINEERING

B.E (ECE) II – Semester (Main & Backlog) Examination, May / June, 2018

Subject :Electrical Technology

Time : 3 Hours **Max Marks : 70**

Note: Answer all questions from Part – A & Any five questions from Part – B.

Part – A (20 MARKS)

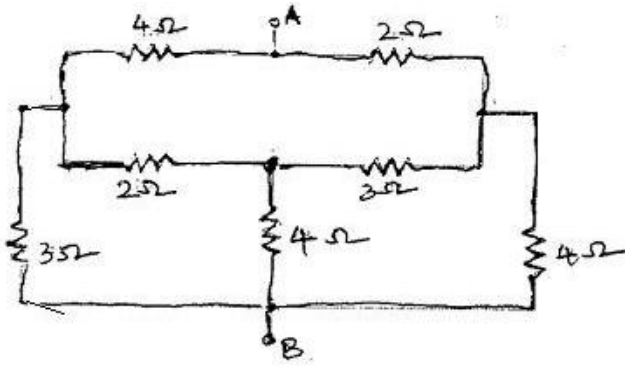
1	Differentiate between lap winding and wave winding	2
2	Draw the characteristics of series and compound motor	2
3	Write the relations between three phase star and delta voltages	2
4	How do you convert a delta to a star connection?	2
5	Compare different types of synchronous machines	2
6	Define the armature reaction of a synchronous machine	2
7	Differentiate between statically induced e.m.f and dynamically induced e.m.f	2
8	Draw the equivalent circuit of a transformer	2
9	What is slip write its expression. How does the slip vary with load?	2
10	How the direction of rotation is reversed for a capacitor start capacitor run motor?	2

PART B (50 Marks)

11a) A4-pole lap wound Dc shunt generator has a useful fulx /pole 0.07 Wb. The armature winding consists of 220 turns, each turn having a resistance of 0.004 ohms. Calculate the terminal voltage when running at 900 rpm. If the armature current is 50A. 5

b) Derive the expression for torque in DC motors 5

12 a) Determine the equivalent resistance between the terminals A and B of network shown in below figure 5



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b) If in the unbalanced Y – connected load of Za = (10+j0), Z_b=(3 + 4j) and Zc= (0-j10) and the load is put across a 3-phase, 200 V circuit with balanced voltages, find the three line currents and voltages across each branch impedance. Assume phase sequence of Vab, Vbc, Vca. 5

13 a) What are the principle advantages of rotating field type of construction of synchronous machines? 4

b) A3 phase 16 – pole alternator has star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.04 wb and is distributed sinsoidally . The speed is 375 rpm. Find the frequency, phase emf and line emf. The coil span is 120^0 electrical. 6

14 a) Develop the equivalent circuit of a single phase transformer. 5

b) Find (i) active and reactive components of no load current and (ii) no load current of a 440/220 V single phase transformer if the power input on no load to the high voltage winding is 80W and power factor of no load current is 0.3 lagging. 5

15 a) Explain how the rotating magnetic field is developed in a 3 – ø induction Motor? 6

b) Calculate the synchronous speed, slip, slip speed and rotor frequency of three-phase, 50Hz, 4-pole Induction motor running at 1440rpm. 4

16 a) Explain how the pulsating mmf of a 1-phase induction motor may be considered equivalent to two oppositely rotating fields. Develop and expression for the torque of the motor. 5

b) The power input to the rotor of a 3-phase, 50 Hz, 6 pole, slip ring induction motor is 38 kW and the motor runs at 950 rpm. The rotor resistance per phase is 0.22 ohms. Determine the value of the rotor current per phase 5

17 a) Explain with a neat diagram the working of Split phase capacitor – start induction motor. 6

b) Explain about core type and shell type transformers 4

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Code No. 25

FACULTY OF ENGINEERING & INFOMATICS

B.E. II- Semester (Main & Backlog) Examination, May / June 2018

Subject : Basic Electrical Engineering

Time : 3 hours **Max. Marks : 70**

Note : Answer all questions from Part-A & any Five Questions from part-B.

PART – A (20 Marks)

1. State and explain Ohm's law. [2]

2. A series circuit having the R=10 Ω and X_L=15Ω. Determine the p.f for the circuit? [2]

3. Write the relationship between phase & line values of voltage, current in **Star connected system**? [2]

4. Why **transformer** rating in **kVA**? [2]

5. A 6-pole, lap wound, 1200 rpm dc generator has 486 conductors on its armature. Calculate the **flux per pole** required to generate an e.m.f of 292 V? [2]

6. What is the necessity of **3-point starter** to start the DC motor. [2]

7. Define **slip**? [2]

8. Why 1-ϕ induction motors are not **self starting**? [2]

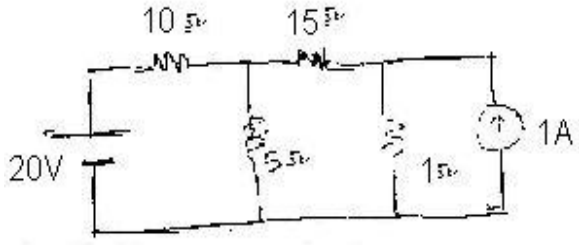
9. Define Simple Tariff & Flat rate tariff? [2]

10. What is Fuse? [2]

PART – B (50 Marks)

11. a) State **Super position Theorem**. [3]

b) Solve for current in 5Ω resistor by principle of **super position theorem** shown in fig. [7]



12. a) Derive the **EMF equation** of a Transformer? [5]

b) A 20 kVA, 1-ϕ, 50 Hz, 2200/220V transformer gave the following test results:
OC test: 2200V applied to primary , power taken 220 W
SC test: power required to circulate FL current in short circuited secondary 240W.
Calculate the **efficiency at full load and half full load** at p.f. 0.8 lagging? [5]

..2

13. a) Explain the different **speed control techniques** of DC Shunt motor? [5]

    b) A 4-pole, lap wound **DC shunt generator** has a useful flux per pole of 0.07 wb. The armature winding consists of 440 conductors, and the armature resistance is 0.055 Ω. Calculate the **terminal voltage** when running at 900 rpm if the armature current is 50A. [5]

14. a) The input power to a 6-pole, 3-ϕ, 50 Hz induction motor is 42kW; the speed is 970 rpm. The stator losses are 1.2kW and the friction & windage losses 1.8kW. Find **i) The rotor Cu losses and ii) The efficiency of the motor**. [5]

    b) Draw and explain the **Torque-Slip characteristics** of a 3-ϕ Induction motor? [5]

15. a) Derive the **condition for Maximum efficiency** of a Transformer and Draw the efficiency curve? [5]

    b) Explain briefly about **Capacitor Start and capacitor Run** single phase Induction motor? [5]

16. a) Draw & Explain the **DC generator characteristics**? [5]

    b) Derive the **Average & RMS value of current** for sinusoidal waveform? [5]

17. Write short note on;
    a) P.F improvement using Static Capacitors [5]

    b) Earthing and its importance. [5]

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Code No. 104 / S

FACULTY OF ENGINEERING & INFORMATICS

B.E. 3/4 (Civil / CSE / I.T.) I – Semester (Supple.) Examination,

May / June 2018

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 ARR.	2
2	Define Risk and uncertainty.	3
3	What is law of supply?	2
4	Consumer goods demand and producer goods demand.	3
5	Write about the concept of opportunity cost.	2
6	Permanent and temporary working capital.	3
7	Cobb-Doughlas production function.	2
8	Average cost and marginal cost.	3
9	What is Contra-entry? Give one example.	3
10	Define liquidity ratio.	2

PART – B (5x10 = 50 Marks)

11 Explain the significance of managerial economics.

12 What is law of demand? Explain with the help of a diagram and also its exceptions.

13 Explain the law of returns to scale.

14 What is meant by working capital management? What are the determinants of working capital needs of an enterprise?

15 Explain the concepts and conventions of Accountancy.

16 The initial cash outlay of a project is Rs. 10,000 and it can generate cash inflow of Rs. 4,000, Rs. 3,000, Rs. 5,000 and Rs. 2,000 in year 1 through 4. Assume a 10% discount rate. Calculate payback, NPV.

17 Prepare a Bank Reconciliation Statement as on 31st December, 2003, from the following information:

a) Balance as per Pass Book (Credit Balance) Rs. 20,000
b) Cheques drawn, but not cashed at Bank Rs. 3,000
c) Cheques deposited in Bank, but not shown in the Pass Book Rs. 2,250.
d) Dividend of Rs. 2,000 collected by Bank directly on 30.12.2003 was not recorded in Cash Book
e) Cheque amounting to Rs. 600 was deposited in bank but it was recorded in the debit side of the Pass Book.
f) Bank charges recorded twice in the Cash Book Rs. 50.

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Code No: 110 / S

FACULTY OF ENGINEERING

B. E. 3/4 (EE/Inst.) I-Semester (Supple.) Examination, May / June 2018

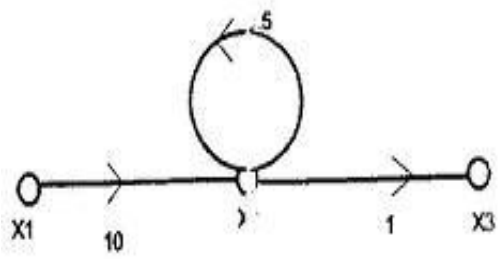
Subject: Linear Control Systems

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 x_3/x_1 of the given flow graph. [3]



2 What is the difference between AC servo motor and 2 phase induction motor? [2]

3 Examine the stability of the system whose characteristic equation is given by $S^5+3S^4+5S^3+12S^2+8S+5=0$ [3]

4 Explain how damping ratio will control the position of the location of the Characteristic equation. [2]

5 Draw the polar plot for the transfer function $G(s)=\frac{s+3}{s(s+1)(s+2)}$ [3]

6 Explain the need of compensation in control system. [2]

7 How to choose State Variable in a system? [2]

8 Develop the State variable representation of the system describe by [3]

$$\frac{d^2y}{dt^3}+\frac{6d^2y}{dt^2}+\frac{11dy}{dt}+6y=u$$

9 Write the advantages of digital control system. [2]

10 What is the relation between Z-domain and S-domain? [3]

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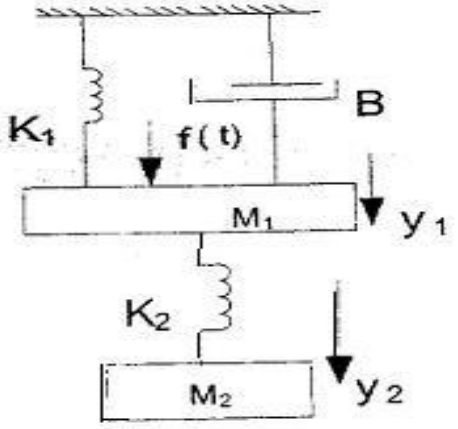
PART-B (50 Marks)

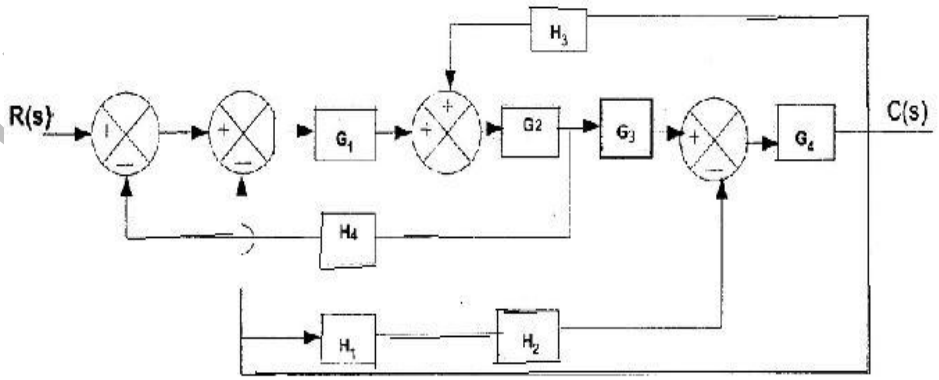
11 (a) Determine the Transfer function $Y_2(s)/ F(s)$ for the system shown below. [5]



(b) Explain the Principle and working of Synchro. [5]

12 Draw the root locus of the unity feedback system whose open loop transfer Function is $G(s) = \frac{K}{S(S+4)(S^2+4S+20)}$ Determine the centroid, break away points, angle of departure and crossing point on imaginary axis. [10]

13 Using block diagram reduction technique find the transfer function C(s)/ R(s) for the system shown in figure. [10]



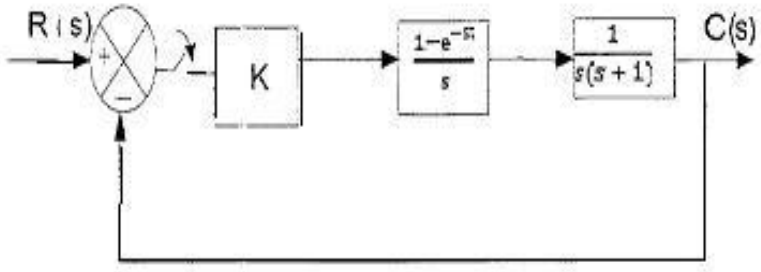
14 Sketch the Bode plot for the transfer function given below and determine Phase margin and Gain margin where $G(s) = \frac{75(1+0.2s)}{s(s^2+16s+100)}$ [10]

15 Define Observability and Controllability then determine the time response of the system describe by [10]

$$\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix}=\begin{bmatrix}0 & 1\\ -1 & -2\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}+\begin{bmatrix}1\\ 1\end{bmatrix}u$$

$$X(0)=\begin{bmatrix}0\\ -1\end{bmatrix};Y=\begin{bmatrix}0 & 1\end{bmatrix}\begin{bmatrix}X_1\\ X_2\end{bmatrix}$$

16 Find the range of K for which the system is stable. [10]



17 Write s a short note on

(a) Nyquist Stability Criterion. [5]

(b) PID Controller. [5]

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Code No.114 / S

FACULTY OF ENGINEERING

B.E. 3/4 (E.C.E.) I-Semester (Supple.) Examination, May / June 2018

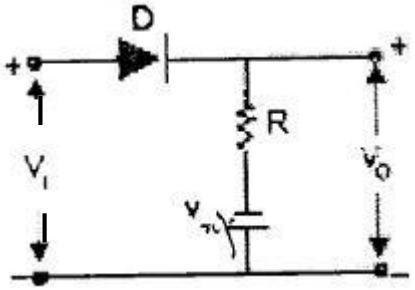
Subject: Pulse & Digital Circuits

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from part – A & Any five questions from part - B

Paper – A (25 Marks)

1. Show that a RC high pass filter can work like a differentiator. [2]
2. Draw the response of low pass filter when the input f(t)= u(t)-u(t-3) is applied to it. [3]
3. Give applications of voltage comparators. [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]

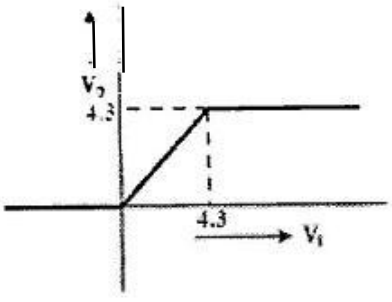


5. Give the applications of a stable multivibrator. [2]
6. What is the principle of working of Schmitt trigger. [3]
7. Explain the concept of Noise margin. [2]
8. What is a tristate buffer. [3]
9. Draw the circuit of CMOS inverter. [2]
10. What is advantage of transmission gate over other MOS logic gates. [3]

PART – B (50 Marks)

11. a) Obtain the expression for % tilt for a high pass filter pass filter for a square wave input. [5]
    b) Sketch the response of a integrator to a symmetrical square wave input of frequency 4Khz and amplitude ± 6 Volts. Given time constant for the circuit is 5m sec. [5]

12. a) State and prove clamping circuit theorem. [5]
    b) Design a clipper for the following transfer characteristics assuming ideal diodes. [5]



13. a) Draw the circuit of monostable multivibrator and explain its operation. [5]
    b) Derive the relationship between types of errors in time base generators. [5]

14. a) Draw and explain the operation of OR-NOR gate using ECL logic family. [6]
    b) Explain the terms FAN in and FAN out with an example. [4]

15. a) Implement the function F=(A+B+C+D)' using CMOS logic. [6]
    b) How can a CMOS logic gate be interfaced to a TTL gate. [4]

16. a) Give the design of integrator and differentiator using RL circuit. [5]
    b) Compare CMOS , TTL and ECL logic families. [5]

17. Write short notes on: [10]
    a) Bistable multivibrator
    b) Transistor as a switch
    c) CMOS open drain output

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Code No: 130 / S

FACULTY OF ENGINEERING

B. E. 3/4 (AE) I-Semester (Supple.) Examination, May / June 2018

Subject: Automotive Transmission

Time: 3 Hours **Max. Marks: 75**

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

PART-A (2.5x10= 25 Marks)

1 Write the advantages and disadvantages of cone clutch.
2 State different types of gear boxes used in practice?
3 What are the advantages of using a spur gear?
4 Sketch 3-speed constant mesh gear box?
5 Define slip in a fluid coupling.
6 What is the function of the reaction member in the torque converter?
7 What are the various parts of Wilson gear box?
8 How are the different speeds obtained in a planetary gear box?
9 What are the advantages if hydro static drives?
10 What are the advantages and limitations of electrical drive?

PART-B (50 Marks)

11 (a) Explain the working principal of multi-plate clutch [5]
(b) Explain the working principal of sliding mesh gear box [5]
12 Explain the working principle of ford T-model gear box with neat sketch
13 (a) Illustrate the working principle of fluid coupling with neat sketches?
(b) Explain multistage & poly phase torque converters?
14 (a) List out the main components of Automatic Transmission System [3]
(b) Explain Chevrolet drive, briefly with a neat sketch [7]
15 Explain briefly construction and working of Janney Hydrostatic drive.
16 Explain briefly the construction and working of Semi-Centrifugal clutch with the help of neat diagram.
17 Explain the following
(a) Transfer Case [2]
(b) Free Wheel [2]
(c) Advantages o& limitations of Ward Leonard system [6]

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Code No. 567 / O

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I – Semester (Old) Examination, May / June 2018

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	Explain the operation of the BHE and AO pins on the 8086 microprocessor.	2
2	Explain the concept of segmented memory. What are its advantages?	3
3	Explain differences between (i) NEG/NOT (ii) RET/IRET	2
4	Write an ALP to find the square of a given number using XLAT instruction.	3
5	List out the different modes of operation of 8253.	3
6	Draw the mode instruction control word format of 8251.	2
7	Differentiate between microprocessor and microcontroller.	3
8	Explain port 3 special functional register in 8051.	2
9	What is the address of SCON and PCON registers? Show the bits of SCON.	2
10	Draw 8k byte RAM interface to 8051.	3

PART – B (5x10 = 50 Marks)

11	a)	Write the differences between minimum and maximum mode operation.	3
	b)	Explain the function of each pin of 8086 in minimum mode operation with a diagram.	7
12	a)	Describe the procedures and macros with an example.	5
	b)	Explain different types of ASCII instructions in 8086.	5
13	a)	Describe the architecture of USART 8251.	6
	b)	Explain command instruction and status read instruction formats of 8251.	4
14	a)	Explain the architecture of 8051 with a neat block diagram.	6
	b)	Explain the following instruction functions of 8051 with an example. (i) SWAP (ii) XCH (iii) MUL (iv) DJNZ	4
15	a)	Describe the functions of each bit in TMOD and IE register.	4
	b)	Write a program to transfer the message “ECE” serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously using 8051 microcontroller.	6
16	a)	Explain any five 8086 addressing modes with examples.	5
	b)	Design an interface between 8086 CPU and two 4kx8 EPORMS and two 4kx8 RAM chips. Select starting address of EPROM suitably. The RAM address must start at 00000H,	5
17		Write short notes on any two :	10
	a)	8257 DMA controller	
	b)	ADC interface to 8051	
	c)	8051 Parallel ports	

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