

FACULTY OF ENGINEERING

BE I – Semester (AICTE) (Suppl.) Examinations, May / June 2019

Subject: Basic Electrical Engineering

Time: 3 Hours

Max. Marks: 70

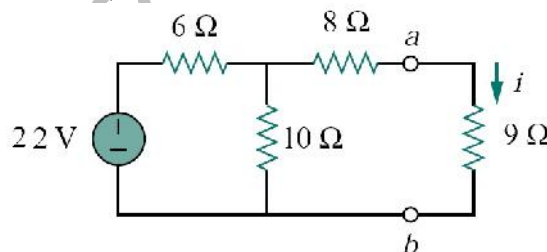
Note: Answer All Questions from Part – A & Any Five Questions from Part – B.

PART – A (10x2 = 20 Marks)

1. State Kirchhoff's current Law. 2M
2. State Superposition Theorem. 2M
3. A series circuit having the $R = 15 \Omega$ and $X_L = 20 \Omega$. Determine the power factor for the circuit? 2M
4. Write the relationship between phase and line values of voltage, current in delta connected system? 2M
5. Name the losses in a transformer. 2M
6. Mention various applications of three phase induction motor. 2M
7. Classify different types of single phase induction motor. 2M
8. Mention various applications of a DC series Motor. 2M
9. What is a Fuse? 2M
10. What is meant by earthing? 2M

PART – B (5x10 = 50 Marks)

11. a) State and explain Norton's Theorem. 5M
- b) Using Thevenin's Theorem, find the current "i" in 9Ω Resistor. 5M



12. a) Derive Average and RMS value of a sinusoidal waveform. 5M
- b) A 220V, 1- ϕ , 50Hz ac supply is applied across series connection of $R=10 \Omega$, $L=0.1H$. Calculate impedance, current, v_r , v_l , power factor, active power and reactive power. 5M
13. a) A 3kVA, 1 ϕ , 50 Hz, 230/115 V transformer gave the following test results:
OC test: 115V, 0.6A, 10W; **SC test:** 60V, 13A, 200W;
 Calculate the efficiency at full load and half load at p.f 0.8 lagging? 5M
- b) Explain the construction of three phase Induction Motor. 5M
14. a) Explain briefly about Capacitor Start & Capacitor Run 1 ϕ Induction motor? 5M
- b) Derive the E.M.F. equation of a DC generator. 5M

15. a) Explain different components of LT Switchgear? 5M
b) Write a short note on power factor improvement using Static Capacitors. 5M
16. a) Explain the different types of voltage and current sources? 5M
b) Analyze the single phase RC series AC circuit with a phasor diagram. 5M
17. Write short notes on:
- a) Ideal Transformer on no load 5M
b) Types of DC generators. 5M

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FACULTY OF ENGINEERING
B.E. I – Semester (AICTE) (Suppl.) Examination, May / June 2019

Subject : Programming for Problem Solving

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 a compiler and interpreter. (2)
- 2 Write an algorithm for given 2 numbers, determine whether (or) not their sum is greater than 100. (2)
- 3 What would be the output for the given program ? (2)


```
int main ( )
{
    int i = 9 ;
    for ( ; i > 1 ; i - - )
        printf(“% d”, i) ;
} return o ;
```
- 4 Why is it necessary to give the size of an array in an array declaration? (2)
- 5 Why are functions needed? (2)
- 6 Differentiate actual parameters with formal parameters. (2)
- 7 Define recursive function with an example. (2)
- 8 Define structure. How do you access structure member / elements? (2)
- 9 What is the use of pointer? (2)
- 10 What is wrong with the following code segment? (2)


```
int * p ;
*p = 10 ;
```

PART – B (50 Marks)

- 11 (a) Write algorithm to check whether a year given by the user is a leap year (or) not. (5)

(b) Briefly explain the steps in compilation and execution of a program written in high level language. (5)
- 12 (a) Write a C program to convert the binary equivalent of an integer number without using array. (8)

(b) How can you simulate logical exclusive OR operator in C. (2)

..2..

- 13 Write a program to compute the square of a given number, without using pow () function of the math library. (10)
- 14 (a) Can main () be called recursively. (4)
(b) Create a structure containing five strings : address1 , address 2, city, state and zip. Create a type called RECORD that can be used to create instances of this structure. (6)
- 15 (a) Write a program to copy one existing file into another file. (8)
(b) What is EOF? When is EOF used? (2)
- 16 (a) Write a program to count the number of words in a string using pointers. (8)
(b) What is the return type of printf () ? (2)
- 17 (a) Write a recursive program to find the GCD of two numbers. (6)
(b) Why do array subscripts start at 0 instead of 1? (4)

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I-Semester (Backlog) Examination, May / June 2019

Subject : Building Technology and Services

Time : 3 Hours

Max. Marks: 75

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

PART – A (25 Marks)

- 1 What is the importance of the site selection for buildings?
- 2 What is the importance of building byelaws?
- 3 What is meant by reverberation?
- 4 List out any three sound absorbent materials.
- 5 List of different type of structural components used for vertical transportation .
- 6 What are the different communication services used in buildings?
- 7 List out any four green building materials.
- 8 List out some low energy materials
- 9 Write steps to draw a pentagon and make it as a triangle using solid editing commands.
- 10 Explain the procedure to draw pyramid using AutoCAD.

PART – B (50 Marks)

- 11 (a) Explain in details factors to be considered in judging plans.
(b) Explain different design considerations for comfort in buildings.
- 12 (a) State different factors effecting Acoustics of buildings.
(b) What is meant by reverberation? Also explain determination of absorption coefficient?
- 13 Draw a power supply system in a residential house to scale. Also,indicate all features on the diagram.
- 14 (a) Explain the meaning of green buildings. State the different rating of green building under LEED.
(b) Write a short note on energy consumption in buildings.
- 15 Plan a residential building, give the sizes of different rooms. Building faces east. Master bed room $14m^2$, Living Room $20m^2$, Dining area $8m^2$, Kitchen $8m^2$, Veranda $6m^2$. Sketch the plan, sectional elevation passing through one external window and door. Assume all the necessary dimensions.
- 16 Draw neat sketches for one and two pipe systems of plumbing used in multi-storeyed buildings. Mention condition under which one is preferable to another.
- 17 Write short notes on the following
 - a) Effective water conservation system
 - b) different views in AutoCAD-3D

FACULTY OF ENGINEERING**B.E. 3/4 (EEE/Inst) I – Semester (Backlog) Examination, May / June 2019****Subject: Digital Electronics and Logic Design****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 A logic circuit to produce a HIGH output only if the input, represented by a 4-bit binary number, is greater than twelve or less than three. Develop the truth table. 2 M
- 2 With suitable example show how pair in K-map eliminates one variable and its compliment? 3M
- 3 Compare the features of DTL & CMOS logic families. 3 M
- 4 Differentiate between the combinational circuits and sequential circuit? Give two examples. 2M
- 5 Draw the two-bit subtractor circuit using logic gates. 2 M
- 6 Illustrate the logic diagram of a clocked SR flip flop. 3 M
- 7 List out the differences between synchronous counter and ripple counter. 2 M
- 8 Brief about the output polarity options for field programmable logic devices. 3 M
- 9 Differentiate between state diagram and state table. 2 M
- 10 Convert D flip-flap to its equivalent T flip-flap. 3 M

PART – B (5x10 = 50 Marks)

- 11 a) Simplify the following SOP equation using the K-mapping procedure and realize the simplified equation using AND – OR gates.
 $A'.B'.C'.D + A.B'.C'.D + A.B.C'.D'+A.B.C'.D'+A.B.C.D$ 6 M
 b) Show that if all the gate in a two-level OR-AND gate network are replaced by NOR gate, the output function does not change. 4 M
12. a) Estimate the schematic and explain the operation of an ECL inverter. Also explain its characteristics. 6 M
 b) Construct full ADDER using demultiplexer. 4M
- 13 a) Design a 4-bit decimal adder using 4-bit binary adders. 5 M
 b) Interpret a seven segment decoder circuit to display the numbers from 0 to 5. 5 M
- 14 a) Construct and explain the working of a 4-bit Up/Down ripple counter. 5 M
 b) Compare the diagram of a 4-bit SISO, and PISO shift register and draw its waveforms. 5 M
- 15 a) Realize the following function using PLA
 $F(w, x, y, z) = (0, 3, 5, 7, 8, 12, 15) + d(2, 6, 9)$. 6 M
 b) Differentiate between Mealy and Morry diagrams and truth tables. 4 M
- 16 a) Model a synchronous MOD-5 counter and explain with waveforms. 5 M
 b) Design an excess three to BCD cone converter. 5 M
- 17 Minimize the following Boolean function using the Quine–McCluskey procedure:
 $f(A, B, C, D, E) = m(0, 1, 2, 9, 11, 12, 13, 27, 28, 29)$ 10 M

FACULTY OF ENGINEERING**BE 3/4 (ECE) I-semester (Backlog) Examination, May / June 2019****Subject : Analog Communication****Time: 3 Hours****Max. Marks: 75**

Note: Answer all questions from part –A and any five question from Part-B

Part-A (25 Marks)

- 1 The tuned circuit of the oscillator in a simple AM transmitter employs a $56 \mu\text{H}$ coil and a 1 mF capacitor if the oscillator output modulated by audio frequencies upto 10kHz . What is the frequency range occupied by the side-bands. 2
- 2 The antenna current of an AM broadcast transmitter modulated to a depth of 40% by an audio sine wave is 11A . It increases to 12A as a result of simultaneous modulation by another audio sine wave. What is the modulation index due to the second sine wave? 3
- 3 Compute the bandwidth required for the transmission of a FM signal having a frequency deviation of 75 kHz and an audio bandwidth of 25kHz . 3
- 4 How is the choice of intermediate frequency done? 3
- 5 List out the advantages and disadvantages of TRF receiver 3
- 6 What are the various sources of noise? 2
- 7 Define thermal noise. State the significance of thermal noise in communication 2
- 8 When a superheterodyne receiver is tuned to 555 kHz , its local oscillator provides the mixer with an input at 100 kHz . What is its image frequency? 3
- 9 Explain briefly about flat-top sampling 2
- 10 State sampling theorem for band pass and passband system 2

Part-B (50 Marks)

- 11 a) Derive the expression for DSB-SC 5
b) Draw and explain the phase discrimination method of SSB-SC with relevant sketch 5
- 12 a) Define Quadrature-Null effect and explain how signal is extracted from synchronous detection of DSBSC signal 5
b) An AM signal has a peak unmodulated carrier voltage, $V_c=100\text{V}$, a load resistance, $R_L = 50\Omega$, and a modulation index, $m_a=1$. Determine the following:
(i) The carrier power
(ii) The lower sideband and upper sideband power.
(iii) Total sideband power
(iv) Total power of the modulated AM signal.
(v) Sketch the AM power spectrum 5
- 13 a) Given an angle-modulated signal : $V(t) = 100 \cos [2\pi \times 10^7 \times t + 4 \sin 2000\pi t]$
Determine (i) Average Transmitter power, (ii) Peak phase deviation, (iii) Peak frequency deviation, (iv) Explain whether it is FM or PM? 5
b) Explain with block diagram, 'Pre-emphasis' and 'De-emphasis' in Frequency Modulation. 5

- 14 Draw the block diagram of super-heterodyne receiver and explain its operation, and what are the factors that influence the sensitivity, selectivity and fidelity of the receiver 10
- 15 a) Derive the expression for 'figure-of-merit' of an AM system 7
b) 24 different message signals, each band-limited to 4kHz are to be multiplexed and transmitted. What is the minimum bandwidth required for (i) FDM with SSB modulation and (ii) TDM with PAM 3
- 16 a) Define thermal noise & white noise, Explain briefly about their origin and comment on their power spectral density with necessary graphs 5
b) Explain in detail about the ideal sampling of band – limited signals 5
- 17 Write a short notes on the following
a) TRF Receiver 4
b) 'Pulse Amplitude Modulation' (PAM) 3
c) 'Inter-Symbol-Interference' (ISI) 3

FACULTY OF ENGINEERING**B.E. 3/4 (Mech.) I – Semester (Backlog) Examination, May / June 2019****Subject: Hydraulic Machinery and Systems****Time: 3 hours****Max. Marks: 75**

Note: Answer all questions from PART-A. Answer any five questions from PART- B. Assume necessary data wherever it is required.

PART – A (25 Marks)

1. A jet of water of 10 cm diameter strikes a flat plate normally with a velocity of 15 m/s. The plate is moving with a velocity of 6 m/s in the direction of the jet and away from the jet. The force exerted by the jet on the plate is
a) 630.5 N b) 720.4 N c) 636.17 N d) 686.12 N 3
2. A single acting reciprocating pump is running at 50 r.p.m delivers 0.00736 m³/s of water. The diameter of the piston is 200 mm and stroke length 300 mm. Coefficient of discharge is
a) 0.872 b) 0.751 c) 0.937 d) 0.675 3
3. A centrifugal pump is required to lift water to a total head of 40 m at the rate of 50 lit/s. If the overall efficiency is 62 %. The power required for the pump is
a) 30.6 kW b) 31.6 kW c) 32.3 kW d) 30.7 kW 3
4. A Pelton wheel develops 1750 kW under a head of 100 m while running at 200 r.p.m and discharging 2500 liters of water per second. The unit discharge of the wheel is
a) 0.24 m³/s b) 0.25 m³/s c) 0.26 m³/s d) 0.23 m³/s 3
5. The type of turbine used is, if the head is 150 meters to develop 1500 kW while running at 300 rpm is
a) Pelton wheel b) Francis turbine c) Kaplan turbine d) All the above 3
6. For high discharge and low head such as irrigation, the type of pump preferred is
a) Centrifugal pump b) Reciprocating pump c) propeller pump d) Gear pump 2
7. The water flows into an air vessel of a reciprocating pump when crank makes an angle of
a) 18° 34' and 161° 26' b) 0° to 18° c) 160° to 180° d) None of the above 2
8. Hydraulic oil should possess
a) Wear resistance b) Chemical stability c) Corrosion resistance d) All the above 2
9. The efficiency of a jet of water having a velocity of 20 m/s impinges on a series of flat Moving vertical vanes which moves at 10 m/s is
a) 40 b) 60 c) 50 d) 80 2
10. Fluid power can be transmitted through either linear (or) rotary motion by using
a) Linear actuators b) Hydraulic cylinders c) Rotary actuators d) All the above. 2

PART – B (5x10 = 50 MARKS)

- 11 A jet of water of diameter 7.5 cm strikes a curved plate at its centre with a velocity of 20 m/s. The curved plate is moving with a velocity of 8 m/s in the direction of the jet. The jet is deflected through an angle of 165° . Assuming the plate smooth. Determine the force exerted on the plate in the direction of the jet, Power of the jet and efficiency of the jet.
- 12 Centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 r.p.m. works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40° at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm. Determine vane angle at inlet, Work done by the impeller on water per second and Manometric efficiency.
- 13 Pelton wheel has a mean bucket speed of 10 m/s with a jet of water flowing at the rate of 700 liters/s under a head of 30 meters. The buckets deflect the jet through an angle of 160° . Determine the power given by water to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.98.
- 14 A single acting reciprocating pump has a cylinder of a diameter 150 mm and stroke length 300 mm. The length and diameter of delivery pipe are 35 m and 100 mm respectively and water is delivered by the pump to a tank which is 25 m above the center of the pump. The atmospheric pressure head is 10.3 m of water and the pump is running at 40 r.p.m. Determine the pressure head in the cylinder at the beginning of the delivery stroke, at the middle of the delivery stroke and at the end of the delivery stroke.
- 15 Draw a neat sketch of Hydraulic circuit. Explain the functions and characteristics of a Hydraulic fluid.
- 16 a) What is meant by an indicator diagram in reciprocating pump? Explain the effect of acceleration on indicator diagram.
b) What is meant by a draft tube? What are the different types of draft tubes?
- 17 a) Explain the characteristic curves of centrifugal pump.
b) What is meant by a specific speed of a turbine and write the expression for it.

FACULTY OF ENGINEERING**B. E. $\frac{3}{4}$ (Prod.) I – Semester (Backlog) Examination, May/June 2019****Subject: Machine Tool Engineering****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. State the assumptions of Merchant's analysis in metal cutting.
2. State five ideal properties of cutting fluid.
3. What is tool life?
4. Sketch insert cutting edge length.
5. Sketches the operations that can be performed on drilling machine.
6. Enlist the work holding devices used for lathe operations.
7. What is the purpose of dividing head on milling machine?
8. Sketch two formed milled shapes using form mill cutter.
9. Sketch five types grinding wheel geometries process with help of neat diagrams.
10. State features of CAPP?

PART – B (50 Marks)

11. (a) Sketch merchants circle diagram and explain the different quantities involved in constructing the diagram.
(b) Explain how temperature of tool is measured in turning operation on lathe machine.
12. (a) Explain single point cutting tool nomenclature in 'ASA' system with a suitable sketch and also state the importance of each angle.
(b) Explain the tool wear equation with respect to
 - i. width land of flank.
 - ii. maximum depth of crater method.
13. (a) Draw neat sketch of standard twist drill and indicate the various parts and angles.
(b) What are chucks? Mention the types. State the difference between independent chuck and universal chuck.
14. (a) What is an indexing? Explain simple indexing and angular indexing.
(b) sketch the setup arrangement for milling helical gear.
15. (a) Describe i) GRIT ii) GRADE iii) STRUCTURE of grinding wheels.
(b) Explain the features of (i) G codes (ii) M codes (iii) canned cycles
16. (a) Explain the mechanism of thread cutting on lathe with sketch.
(b) Explain Group Technology (i) features (ii) advantages, (iii) applications.
17. (a) Explain the specification of grinding machine wheel.
(b) briefly explain the geometry of milling cutter.

FACULTY OF ENGINEERING

B.E. 3/4 (AE) I - Semester (Backlog) Examination, May / June 2019

Subject : Automotive Chassis Components

Time : 3 hours

Max. Marks : 75

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

PART – A (10 x 2.5 = 25 Marks)

- 1 Draw a simple sketch of a ladder frame and state the functions of each member.
- 2 Define Chassis.
- 3 Draw the live Axle and name the parts.
- 4 What is meant by include Angle?
- 5 Define tractive effort.
- 6 Draw the types of propeller shaft.
- 7 State the advantages of independent suspension system over dependent suspension system.
- 8 State constructions details of leaf spring.
- 9 List out the types of brakes used in Automobiles.
- 10 Differentiae b/w mechanical and hydraulic brakes.

PART – B (5 x 10 = 50 Marks)

- 11 List out the different types of frames used in automobiles and with aid of sketches explain the salient features of each. 10
- 12 With the aid of sketches explain the method of testing a ladder type frame in the laboratory. 10
- 13 Explain briefly steering geometry. 10
- 14 Explain anti rolling bar used in suspension system. With neat sketch. 10
- 15 Explain any one type of drive system with the aid of neat sketch. 10
- 16 Explain construction details and working principle of differential with neat sketch. 10
- 17 What is meant by power assisted braking system? Explain in detail the working principle of any one type with a suitable sketch. 10

FACULTY OF ENGINEERING**B.E. 3/4 (CSE) I - Semester (Backlog) Examination, May / June 2019****Subject : Software Engineering****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 Software Engineering. What is its importance? | 2 |
| 2 | What is an Agile Process? How it is different from traditional sequential process? | 3 |
| 3 | List the various tasks of Requirement Engineering. | 2 |
| 4 | What is Effort? How is effort estimated? | 3 |
| 5 | Differentiate between cardinality and modality. | 2 |
| 6 | Are stepwise refinement and refactoring the same thing? If not, how do they differ? | 3 |
| 7 | What is Software Architecture? | 2 |
| 8 | Define coupling. List various types of coupling. | 3 |
| 9 | What is Stress Testing? | 2 |
| 10 | How are verification and validation important individually? | 3 |

PART – B (50 Marks)

- | | | |
|-------|----------------------------------------------------------------------------------------------------------------|----|
| 11 a) | What is the importance of Process Framework? What are the SEA's that are populated in each Framework Activity? | 5 |
| b) | Explain in detail about spiral model with a neat diagram. | 5 |
| 12 a) | Explain COCOMO-II Effort Estimation method with example? List its Advantages and disadvantages. | 5 |
| b) | What is requirements engineering? Explain about elicitation in detail | 5 |
| 13 | Discuss the various Analysis Modeling approaches in detail? | 10 |
| 14 a) | Explain the process of converting or mapping Data Flow Diagrams into Software Architecture? | 6 |
| b) | Explain the Golden rules performed in user interface design. | 4 |
| 15 | Explain a suitable overall strategy for S/W testing for conventional S/W architectures? | 10 |
| 16 | Explain about | |
| a) | RAD Model | 4 |
| b) | Software project planning | 3 |
| c) | Call and return architectural style | 3 |
| 17 | Write short notes on: | |
| a) | Design process and Design Quality. | 4 |
| b) | Glass –Box testing(White-Box Testing) | 6 |

FACULTY OF ENGINEERING
B.E 3/4 (I.T.) I – Semester (Backlog) Examinations, May /June 2019

Subject: Software Engineering

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 activities involved in a generic process model of software engineering | 2 |
| 2. Define myth and list types of myths in Software Engineering. | 2 |
| 3. Write about requirement engineering and list different tasks in it. | 3 |
| 4. List various modeling approaches in requirement modeling. | 2 |
| 5. Briefly explain about architecture styles. | 3 |
| 6. Define design process and why software design considered as a blueprint? | 3 |
| 7. What is software quality and software reliability? | 3 |
| 8. Differentiate testing and debugging. | 3 |
| 9. Write short notes on software configuration management (SCM). | 2 |
| 10. Define SPI and explain its usage in Software Engineering. | 2 |

PART – B (50 Marks)

- | | |
|-----------------------------------------------------------------------------------------------|-------|
| 11. a) Discuss waterfall model and spiral model in detail. | 5 |
| b) Explain about unified process. | 5 |
| 12. a) Explain various design concepts. | 5 |
| b) Write about component based development. | 5 |
| 13. Explain about software testing strategies in detail. | 10 |
| 14. Explain white box testing? Illustrate basis path testing with an example. | 10 |
| 15. a) Define software risk? And explain risk management in detail. | 5 |
| b) Write short notes on model based testing. | 5 |
| 16. a) Explain metrics for Design model. | 5 |
| b) What is Estimation? Explain importance of estimation before starting software development. | 5 |
| 17. Write Short notes on | (5+5) |
| a) RMMM Plan. | |
| b) Reactive and proactive risk strategies | |

FACULTY OF ENGINEERING**B.E. (Civil) IV-Semester (CBCS) (Main & Backlog) Examination, May / June 2019****Subject : Fluid Mechanics – II****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 Define total energy line and hydraulic gradient line. 2
- 2 Determine the hydraulic radius of pipe, which is laid at a slope of 1 in 1000 and in which the velocity of flow is 1.2 m/s. Take Chezy's constant $C = 45$. 2
- 3 Write the Dupit's equation for pipes and explain the terms in it. 2
- 4 State the condition based on which a closure of valve is gradual or instantaneous. 2
- 5 Determine the drag force on a flat plate of area 2m^2 with wind speed of 14 m/s. Take density of air as 1.15 Kg/m^3 and coefficient of drag as 0.18. 2
- 6 Define laminar sub-layer. 2
- 7 Define the most economical section of a channel. 2
- 8 State the main features of uniform flow in a channel. 2
- 9 Differentiate gradually varied flow (GVF) and rapidly varied flow (RPF). 2
- 10 The depth of flow of water is 2m and width of channel is 0.3m. Determine the critical depth if the discharge through the channel is $1.5 \text{ m}^3/\text{s}$. 2

PART – B (50 Marks)

- 11 a) Derive Hagen Poisuille's equation for laminar flow through circular pipes. 5
 b) In a smooth pipe of diameter 0.5m and length 1000m water is flowing at the rate of $0.05\text{m}^3/\text{s}$. Assuming the kinematic viscosity of water as 0.02 stokes, determine the Reynolds number and state whether the flow is laminar or turbulent. Based on it determine the coefficient of friction f and find the head lost due to friction. 5
- 12 a) Write about the manufacturing of reinforced concrete pipes. State the merits and demerits of using reinforced concrete pipes. 5
 b) In a pipe of 600mm diameter and 3000m length, provided with a valve at the end, water is flowing with a velocity of 2 m/s. Find i) The rise in pressure if the valve is closed in 20 seconds, assuming velocity of pressure wave $C = 1500 \text{ m/s}$
 ii) The rise in pressure if the valve is closed in 2.5 seconds. Assume the pipe to be rigid and take bulk modulus of water as 2 GN/M^2 . 5

- 13 a) Explain the boundary layer separation with a neat sketch. 5
b) If the velocity distribution in the boundary layer is given by
$$\frac{u}{U} = 2\left(\frac{y}{u}\right) - 2\left(\frac{y}{u}\right)^3 + \left(\frac{y}{u}\right)^4$$
, determine the displacement thickness, momentum thickness and energy thickness. 5
- 14 a) What is critical flow? Show that the critical flow is two thirds of the specific energy. 5
b) A concrete lined circular channel of 3.6m diameter has a bed slope of 1 in 600. Determine the velocity and flow rate for the conditions of maximum velocity and maximum discharge. Take Chezy's constant C = 50. 5
- 15 a) State and prove the condition under which a triangular section in an open channel will be most economical. 5
b) Find the slope of the free water surface in a rectangular channel of width 20m, having depth of flow 5m. The discharge through the channel is 50 m³/s. The bed of the channel is having a slope of 1 in 4000. Take Chezy's constant C = 60. 5
- 16 a) Derive the dynamic equation for gradually varied flow with usual notations. State the assumptions made in the derivation. 5
b) Derive the momentum equation for a jump in horizontal rectangular channel. 5
- 17 Write short notes on 10
i) Water hammer phenomenon
ii) Reynolds experiment
iii) Drag on a flat plate

FACULTY OF ENGINEERING**B.E (EEE/EIE) IV-Semester (CBCS) (Main& Backlog) Examination, May/June 2019****Subject : Linear Integrated Circuits****Time : 3 Hours****Max. Marks : 70***Note : Answer all questions from Part-A & Any five questions from Part-B***Part-A (20 MARKS)**

1. Define following terms CMRR and Power Supply Rejection ratio. 2M
2. Draw the block diagram of Operational Amplifier. 2M
3. Explain offset balancing techniques. 2M
4. Write the applications of Zero Crossing Detector. 2M
5. Write the advantages and disadvantages of Instrumentation Amplifier. 2M
6. Write the conditions for sustained oscillations. 2M
7. Compare comparator and Schmitt trigger. 2M
8. Compare series voltage regulator and shunt voltage regulator. 2M
9. Draw the ideal and practical characteristics of band pass and band reject filter. 2M
10. In what way current fold back feature is different from current limit. Explain. 2M

PART- B (50 MARKS)

11. (a) Derive the expression for gain, input resistance, output resistance and bandwidth of a feed back non-inverting amplifier. 5M
(b) Design a mono stable multivibrator using op-amp for 1 m sec. Time Delay. 5M
12. (a) Explain how multiplication of two voltages can be done using Op-amp. 5M
(b) Derive an expression for the output of an instrumentation amplifier.
13. (a) Explain operational amplifier working as comparator. Draw and explain the voltage controlled oscillator. 5M
(b) Explain principle of square wave oscillator with necessary derivations. 5M
14. (a) Draw the block diagrams of linear voltage regulator and switching voltage regulator. 5M
(b) What are the fixed voltage regulator IC's? Explain the operation of 723 regulator IC with the help of its block diagram. 5M
15. (a) Design a Butter worth filter of second order LPF for 1Khz cut off. 5M
(b) Compare the characteristics of Butterworth, Chebyshev and Bessels filters. 5M
16. Explain the Functional block diagram of 555 Timer and working as Astable multivibrator 10M
17. Write about the following
(a) Switched Capacitor filters. 5M
(b) Write about op-amp precision rectifiers. 5M

FACULTY OF ENGINEERING**B.E IV – Semester (CBCS) (ECE) (Main & Backlog) Examination, May/June 2019****Subject: Pulse Digital and Integrated Circuits****Time: 3 Hours****Max. Marks: 70****Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.****PART – A (20 Marks)**

- 1) Why are RC circuits preferred to RL circuits? [2]
- 2) Show that low-pass circuit with a large time constant acts as an integrator. [2]
- 3) What do you mean by a non-regenerative comparator? Give an example. [2]
- 4) Why clamping circuit is also called dc inserter? [2]
- 5) What is necessity of triggering? What are the different types of triggering? [2]
- 6) Define the terms: stable state, quasi stable state. [2]
- 7) What are the characteristics of ECL family? [2]
- 8) Draw the circuit diagrams of AND, OR and NAND in TTL families. [2]
- 9) Compare TTL and CMOS ICS with regard of their electrical parameters, speed of operation, power dissipation and noise margin. [2]
- 10) Draw CMOS transmission gate. What are advantages over an NMOS switch? [2]

PART – B (50 Marks)

11. a) Draw and explain the response of RLC circuit for a step input. [4]
b) Derive an expression for the percentage tilt of the output of a high pass circuit with large time constant excited by a symmetrical square wave with zero average value. [6]
12. a) Explain the operation of positive peak clamper with output waveforms. [4]
b) Design a circuit to transmit a sine wave which lies between -3V and +6V. Explain the same with the help of transfer characteristics. [6]
13. a) Explain the principle of operation of bi-stable multivibrator with the help of a diagram and derive expressions for currents and voltages at each transistor. Draw the waveforms at collector and base of transistors. [6]
b) With the help of a neat circuit diagram, explain the working of a transistor current time base generator. [4]
14. a) What is meant by open-collector output Of TTL gate and what is utility? Draw and explain the circuit diagram of open-collector output TTL gate. [7]
b) What are the advantages of using multiplier emitter transistor circuit? [3]
15. a) Discuss the factors that are to be considered while interfacing MOS and CMOS ICs. [4]
b) Draw the ckt diagram of CMOS transmission gate and explain its operation. What are its advantages over an NMOS switch? [6]
16. a) Derive an expression for the rise time of the output of a high-pass circuit excited by a step input. [6]
b) Explain the operation of diode comparator. [4]
17. Write notes on any two of the following:
 - a) Commutating capacitors [5]
 - b) Interfacing TTL and CMOS ICs. [5]
 - c) Bus contention [5]

FACULTY OF ENGINEERING

BE IV - Semester (CBCS)(M/P) (Main & Backlog) Examination, MAY /June 2019

Subject : Basic Electronics

Time: 3 Hours

Max Marks: 70

Note: Answer all questions from Part-A & Any Five questions From Part-B.**Part - A (20 Marks)**

1. Define diffusion Current in a semiconductor 2
2. Draw π - filter circuit 2
3. How α and β are related to each other? 2
4. A JFET has a drain current of 4 mA. If $I_{DSS} = 6\text{mA}$ and $V_p = -6\text{V}$. Find the values of V_{GS} and $V_{GS}(\text{off})$ 2
5. An amplifier has an open loop gain of 1000 and a feedback ratio of 0.04. If the open loop gain changes by 10% find the percentage change in gain of the amplifier with feedback 2
6. A simple tank Circuit has an inductance of 1mH and a capacitor of 9.3 pF. Find its resonance frequency 2
7. List the linear applications of an OP-AMP 2
8. Draw the circuit of half adder and explain 2
9. Draw the symbols of photo diode, photo transistor and SCR. 2
10. Mention applications of CRO 2

PART – B (50 Marks)

- 11.a) Describe Hall effect and derive the expression for hall coefficient 5
 - b) A HWR with a load of 1K rectifies an ac of 325V peak value. Calculate (i) Peak current (ii) dc current (iii) rms Value of Current (iv) ripple factor 5
12. Draw the circuit diagram of an NPN Junction transistor CE configuration and describe its input and output characteristics 10
- 13.a) Draw the block diagram of an amplifier with feedback. Explain 5
 - b) Explain the operation of crystal oscillator 5
14. Explain any two applications of OP-AMPs with neat Circuit diagrams 10
- 15.a) Explain the working of LVDT 5
 - b) Compare LED and LCD 5
- 16.a) Explain the operation of a Bridge rectifier 5
 - b) Explain the significance of NAND and NOR gates 5
17. Write short notes on
 - i) Zener Voltage regulator
 - ii) UJT

(5+5)

FACULTY OF ENGINEERING**B. E. IV – Semester (A.E) (Main & Backlog) Examination, May/June 2019****Subject: Automotive Chassis Components****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 a chassis frame and state the functions of each member.
2. Sketch the layout of the power flow for a Rear engine and rear wheel drive vehicle and mark the main components.
3. Write the applications of dead Axle & live Axle.
4. What is meant by centre point steering?
5. Define Traction.
6. Draw the types of C.V. joints (Constant Velocity)
7. List out the types of Rear suspension systems.
8. Draw a leaf spring and name the parts.
9. Differentiate between hydraulic brakes and AIR brakes.
10. List out the types of Brakes used in vehicles.

PART – B (50 Marks)

11. Draw chassis layout according to wheels, drive and engine location State the merits and demerits of each. 10
12. (a) Explain about the cross-sections used for chassis frame for different vehicles with simple sketches. 6
(b) Explain Reinforcement and explain with neat sketch any two types of joints. 4
13. Define and explain the following with suitable sketches for automotive vehicles.
i) Camber ii) caster iii) king pin inclination iv) Toe in & Toe out
14. (a) Draw and explain the Rack and pinion steering system. 6
(b) Explain any one steering mechanism. 4
15. Explain briefly Torque tube drive with the aid of sketch. 10
16. Explain briefly non-slip differential with neat sketch. 10
17. (a) Explain in detail the working principle of Hydraulic braking system with a suitable sketch. 6
(b) Explain the working principle of Brake bleeding. 4

FACULTY OF ENGINEERING**B.E. (CSE) IV – Semester (CBCS)(Main & Backlog) Examination, May / June 2019****Subject: Computer Organization****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 How is effective address calculated in “Indirect Addressing mode”? 2
- 2 Draw a diagram to illustrate the interrupt cycle. 2
- 3 What is Gray Code? 2
- 4 What are Flynn’s classification? 2
- 5 The contents of register A are 1101 and that of register 'B' is '0110'. Find the result of the following micro-program sequence 2

$$T_1: B \leftarrow B$$

$$T_2: A \leftarrow A+B$$

- 6 What is meant by Pipelining? 2
- 7 Define virtual memory. 2
- 8 What is meant by basic computer instruction format? 2
- 9 What is auxiliary memory? 2
- 10 What are the three methods of data transfer between I/O peripheral device and memory? 2

PART – B (5x10 = 50 Marks)

- 11 a) Explain fixed point representation with examples? 5
b) Explain Instruction Cycle with flow chart and example? 5
- 12 a) Design a bus system with multiplexers and other gates for communicating between registers. 5
b) What do you understand by arithmetic shift? Explain 5
- 13 Explain Booth’s Algorithm with an example and draw flow chart. 10
- 14 a) Discuss in detail about Read and write operation with timing diagram. 5
b) Explain the concept of Array Processor. 5
- 15 a) Explain in detail about DMA data transfer. 5
b) Distinguish between isolated I/O and memory mapped I/O with an example. 5
- 16 a) What is cache memory, explain a mechanism of data transfer between cache and main memory. 6
b) Briefly explain the functioning of magnetic disks. 4
- 17 Write a short note on:
 - i) Computer Registers 4
 - ii) Modes of transfers 3
 - iii) RAM and ROM 3

FACULTY OF ENGINEERING**B.E. (I.T.) IV - Semester (Main & Backlog) Examination, May / June 2019****Subject : Scripting Languages****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

- 1 What are the uses for scripting languages?
- 2 Mention the idea of scripting today.
- 3 Define Python versions 3.X.
- 4 What are the data types in python list?
- 5 What is the uses of break?
- 6 List the standard Input device.
- 7 Define Sets.
- 8 List the Built-in functions.
- 9 Define with statement.
- 10 How to closing a file?

PART – B (50 Marks)

- 11 (a) What are the characteristics of scripting languages? (5)
(b) List types of scripting languages and what are the uses of each scripting languages. (5)
- 12 (a) Explain the installation procedure of python. (5)
(b) Explain the expressions with examples in python. (5)
- 13 (a) Define Dictionaries. Explain function calling with example. (5)
(b) What is strings and string operations? (5)
- 14 (a) Write a running a python script. (5)
(b) Discuss Formatting string with %. (5)
- 15 (a) Discuss file and read positions in python. (5)
(b) Explain the python file object methods. (5)
- 16 Discuss in detail how scripting languages differ from non-scripting languages. (10)
- 17 (a) Define Python. Discuss history language features. (5)
(b) What are the operations in python? Explain each with example. (5)
