

Subject Code: R16CE2201

II B.Tech II Semester Supplementary Examinations, November-2018.

STRUCTURAL ANALYSIS-I

(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

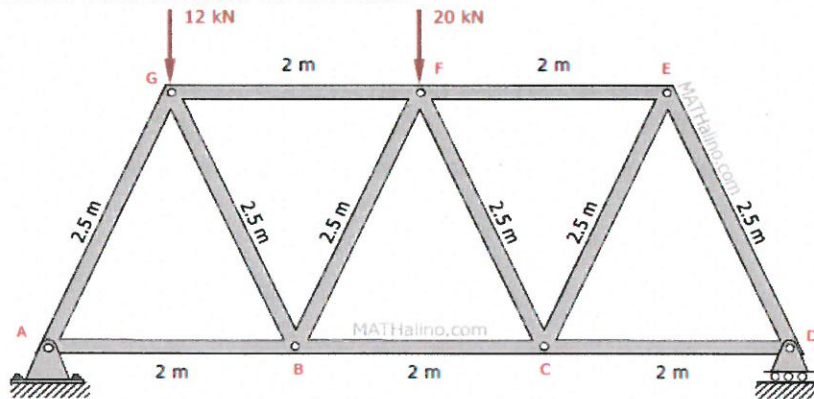
1. (a) What are the limitations of Double integration method
- (b) What are the advantages and disadvantages of Moment area method
- (c) Differentiate between linear and non-linear analysis
- (d) Explain about inelastic strain energy
- (e) What do you mean by Arch action of a Beam
- (f) Show the load positions for max +ve shear force and -ve shear force if a UDL shorter than the span is traversing from left to right of a beam

[2+2+2+2+2+2]

PART-B

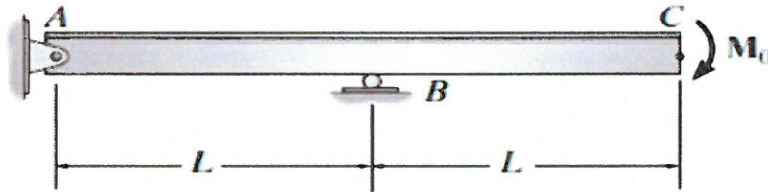
4 X 12 = 48

2. Compute the force in each member of the truss (12)

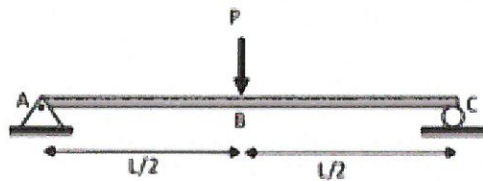


3. . A beam AB of length 6m simply supported at the ends carries a point load 55 KN at a distance 4m from left end. $I_{xx} = 55 \times 10^{-6} \text{ m}^4$ and $E = 200 \times 10^6 \text{ KN/m}^2$. Find (a) The deflection under the load (b) The position and amount of maximum deflection (12)

4. Use the conjugate beam method to determine the slope and deflection at point C of the beam shown in the below fig. Take EI as constant (12)



5. Determine the slope and deflection at point B of the beam shown in the fig. Take EI = constant (12)



6. A UDL of 8 kN/m covers left half span of 3-hinged parabolic arch of span 46m and central rise 7m. Solve for the horizontal thrust also find (a) BM and Shear force (b) Normal thrust (c) Radial shear at the loaded quarter point (12)

7. Four point loads 7 kN, 14 kN, 14 kN and 10 kN have centre to centre spacing of 2m between consecutive loads and they traverse a girder of 28m span from left to right with 10 kN load leading. Calculate the maximum bending moment and shear force at 6m from the left support (12)

*proceed to point
 moment = 6/14 + 8
 subject up to point B*



Subject Code: R16CE2202

II B.Tech II Semester Supplementary Examinations, November-2018.

HYDRAULICS AND HYDRAULIC MACHINERY

(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Write the various types of flow in open channels?
(b) What do you mean by dimensional number?
(c) What are the applications of momentum principle?
(d) Define cavitation
(e) What is meant by multistage pump?
(f) What are the different types of turbines used in Hydroelectric Power Plants?
[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) A most economical trapezoidal section is required to give a maximum discharge of 20 m³/s of water. The slope of the channel bottom is 1 in 1500. Taking C=70 in Chezy's equation, determine the dimensions of the channel.
(b) A rectangular channel which is laid on a bottom slope of 1 in 160 is to carry 20 m³/s of water. Determine the width of the channel when the flow is in critical condition. Take Manning's constant n=0.014
3. (a) Explain the different types of hydraulic similarities that must exist between a prototype and its model
(b) State Buckingham's theorem. Why this theorem is considered superior over the Rayleigh's method for dimensional analysis
4. (a) Obtain an expression for the force exerted by a jet of water on a fixed vertical plate in the direction of jet
(b) A jet of water of diameter 150 mm strikes a flat plate normally with a velocity of 12m/sec. The plate is moving with a velocity of 6m/sec in the direction of the jet and away from the jet. Find the force exerted by the jet on the plate
5. (a) Define and explain hydraulic efficiency, mechanical efficiency and overall efficiency of a turbine
(b) A Pelton wheel is required to develop 8825 kW when working under the head of 300m. The speed of the Pelton wheel is 540 rpm. The coefficient of velocity for the jet is 0.987, speed ratio is 0.46. Assuming the jet ratio as 10 and overall efficiency as 84%. Estimate the
 - i) Number of jets
 - ii) Diameter of the wheel
 - iii) Quantity of water required

6. (a) With a neat sketch, explain the principle and working of a centrifugal pump
(b) A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm 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 degrees at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm. List the following
- Vane angle at inlet
 - Work done by impeller on water per second
7. (a) Classify the hydro power plants on the basis of functions and plant capacity.
(b) Define and state the equations for
- Load factor
 - Capacity factor
 - Utilization factor



Subject Code: R16CE2204

II B.Tech II Semester Supplementary Examinations, November-2018.
SURVEYING-II
(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define the terms transiting of a theodolite and line of collimation.
(b) What is meant by closing error in a closed traverse and mention the methods to rectify the closing error?
(c) Explain the terms degree of curve and versed sine.
(d) What is meant by polar angle?
(e) How do you calculate the distance and elevation from a Jettcot direct reading Tachometer?
(f) What is the necessity of locating horizontal control?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the reiteration method to find a horizontal angle with tabular form. [6M]
(b) What is the purpose of Anallactic lens and explain its principle? [6M]
3. (a) The top(P) of a chimney was sighted from two stations Q and R at very different levels, the stations Q and R being in line with the top of the chimney. The angle of elevation from Q to the top of the chimney was $41^{\circ} 21'$ and that from R to the top of the chimney was $22^{\circ} 18'$. The angle of the elevation from R to a vane 2.5m above the foot of the staff held at P was $17^{\circ} 11'$. The heights of instrument at Q and R were 1.87m and 1.75m respectively. The horizontal distance between Q and R was 125m and the reduced level of R was 113.00m. Find the R.L of the top of the chimney and the horizontal distance from Q to the chimney. [6M]
(b) Explain the steps for preparation of Gale's traverse table. [6M]
4. (a) Explain the procedure for setting out a simple curve by two Theodolite method. [6M]
(b) Calculate the offsets from the long chords at 4m interval for a curve having deflection angle 30° and radius of the curve is 30m. [6M]
5. (a) What are the different types of transition curves and explain them?
(b) What is meant by tangent correction? Explain the tangent correction procedure while setting a vertical curve. [6M]

6. (a) Explain the Beaman Stadia arc with diagram. [6M]
(b) A theodolite was setup at a station A and vertical angles were measured to vanes kept at a station B. The angles measured to the 1m and 5m marks were $-2^{\circ}30'$ and $+3^{\circ}45'$ respectively. A reading of 1.875m was also taken on a staff held at a BM of RL 258.5m. Find the horizontal distance AB and the RL of B. [6M]
7. (a) Explain the preliminary steps in Hydrographic surveying and write the applications of Hydrographic surveying. [6M]
(b) List out the various applications of total station in Civil Engineering and explain them. [6M]



Subject Code: R16CE2205

II B.Tech II Semester Supplementary Examinations, November-2018.

HYDROLOGY AND IRRIGATION ENGINEERING

(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is called effective rainfall ?
- (b) What is infiltration?
- (c) List the basic assumptions in unit hydrograph .
- (d) List the types of irrigation .
- (e) Define delta of a crop and crop ratio ?
- (f) State the drawbacks of Kennedy's method?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the different types of precipitation with examples?
- (b) Describe Simon's rain gauge with a neat sketch?
3. (a) What is Evapo-transpiration? Describe in detail the factors effecting Evapo-transpiration ?
- (b) Describe the factors effecting run-off ?
4. (a) What are the various methods of estimating the design flood of a catchment?
- (b) Sketch a hydrograph resulting from simple storm and explain its features.
5. (a) Discuss the advantageous and disadvantageous of irrigation ?
- (b) Describe the importance of lift irrigation and well irrigation practice ?
6. (a) Describe soil classification ?
- (b) Derive the relationship between Duty and Delta for the given base period .
7. (a) Design an irrigation channel using Lacey's theory for the following data
Discharge : $40 \text{ m}^3/\text{sec}$
Silt factor : 1.02
Side Slope : $\frac{1}{2} : 1$
- (b) Briefly explain about types of canals .



Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EE2205

II B.Tech II Semester Supplementary Examinations, November-2018.

ELECTRICAL MACHINES-II

(EEE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What are the advantages of three phase induction motor?
- (b) What care should be taken at the time of construction to reduce the eddy current loss in induction motor?
- (c) What is distributed winding?
- (d) Name the various methods for predetermining the voltage regulation of three phase alternator?
- (e) What is meant by infinite bus bars?
- (f) Why single phase induction motor has low power factor?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the principle of working of three phase induction motor? [6M]
- (b) A 6 pole, three phase induction motor runs at a speed of 960 rpm, the supply frequency being 49.5 HZ. If the rotor copper loss is 540W and friction and windage losses total 160W. Calculate the shaft torque. [6M]
3. (a) Explain why a starter is required for an induction motor? [6M]
- (b) A three phase squirrel cage induction motor takes 190% of full load line current and develops 36% of full load torque at starting by star-delta starter. What would be the starting torque and current if an auto transformer with 70% tapping were used? [6M]
4. (a) Explain the construction features of salient pole and non salient pole alternators? [6M]
- (b) A 4 pole AC machine has a three phase winding wound in 36 slots with coil span of 140° . Compute i) the pitch factor ii) Distribution factor iii) winding factor [6M]
5. (a) Compare the value of regulation obtained by EMF, MMF and ZPF methods [6M]
- (b) Describe in detail any one method of predetermining the voltage regulation of an alternator with phasor diagram? [6M]
6. (a) Explain the principle of operation of synchronous motor and hence develop its phasor diagram? [6M]
- (b) A 6 pole, three phase star connected synchronous motor has synchronous impedance of $(0.5+j8)\Omega$ /phase. When operating on 2.2 KV, 50 HZ bus bars, its field current is such that the EMF induced is 1.8 KV. Calculate the maximum torque that can be developed at this excitation condition [6M]
7. (a) Explain the construction details of single phase induction motor? [6M]
- (b) What are the advantages of single phase induction motor? [6M]



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Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EE2206

II B.Tech II Semester Supplementary Examinations, November-2018.

ANALOG ELECTRONICS

(EEE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

- (a) What is feedback, give the types of feedbacks?
(b) List out the differences between linear and non linear wave shaping
(c) Draw the equivalent circuit for practical op amp.
(d) Draw the pin diagram of IC 555
(e) What is Allpass filter draw the characteristics
(f) What are the applications of V-I converters?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

- (a) Explain Voltage series feedback & Current shunt feedback amplifiers?
(b) Discuss the Feedback topologies?
- Explain the operation of RC network as a differentiator and an integrator for Sinusoidal input, Step input, Pulse input and Square input signals.
- (a) With neat sketch explain the operation of OP amp Integrator circuit.
b) Explain the operation of the instrumentation amplifier.
- (a) Explain the operation of an astable multivibrator using 555 timer. Derive the expression for on and off state time periods.
(b) Explain Wien bridge oscillator using Op-amp?
- (a) Explain the operation of narrow band reject filter with characteristics.
(b) Draw the circuit diagram of All pass filters and derive its output response.
- (a) Describe the operation of the dual slope ADC
b) Compare the characteristics and specifications of ADC and DACs.

Subject Code: R16ME2202

II B.Tech II Semester Supplementary Examinations, November-2018.

THEORY OF MACHINES-I

(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1

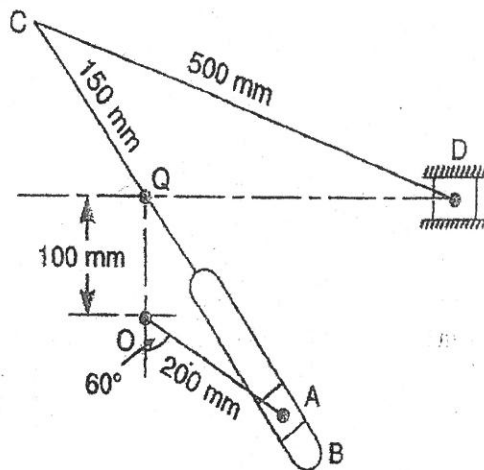
[2+2+2+2+2+2]

- Distinguish between mechanism and machine.
- What is velocity of rubbing? How is it found.
- Define the following terms as specified to cams (1)Base circle (2) pitch circle
- Define angular velocity of precession.
- What are the limitations of simple watt governor.
- State law of gearing

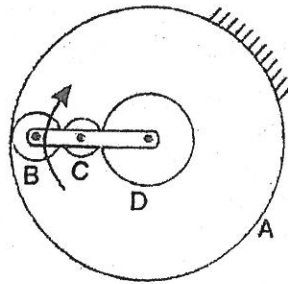
PART-B

4 X 12 = 48

- What is meant by degrees of freedom of a mechanism (2)
 - Explain different types of kinematic pairs with neat diagrams. (10)
- Fig shows a quick return motion mechanism in which the driving crank OA rotates at 120 r.p.m. in a clockwise direction. For the position shown, determine the magnitude and direction of 1. The accelerations of the block D and 2.the angular acceleration of the slotted bar QB. (12)



- 4 (a) How are the cams classified? Describe in detail (5)
- (b) Draw the profile of a cam that gives a lift of 40 mm to a rod carrying a 20mm diameter roller. The axis of the roller passes through the centre of the cam. The least radius of the cam is 50mm. The rod is to be lifted with simple harmonic motion in a quarter revolution and is to be dropped suddenly at half revolution. Determine the maximum velocity and maximum acceleration during the lifting. The cam rotates at 60 rpm. (7)
- 5 a) what do you mean by gyroscopic couple? Derive a relation for its magnitude. (5)
- b) How do the effects of gyroscopic couples and of centrifugal force make the rider of a two wheeler tilt on one side? Derive a relation for the limiting speed of the vehicle. (7)
- 6 a) What is the function of a governor? How does it differ from that of a flywheel? (5)
- b) Sketch a hartnell governor. Describe its function and deduce a relation to find the stiffness of the spring. (7)
- 7 (a) Explain the difference between simple, compound, and epicyclic gear trains. What are the special advantages of epicyclic gear trains? (5)
- b) An epicyclic gear train, as shown in fig. is composed of a fixed annular wheel A having 150 teeth. The wheel A is meshing with wheel B which drives wheel D through an idle wheel C, D being concentric with A. The wheels B and C are carried on an arm which revolves clockwise at 100r.p.m. about the axis of A and D. If the wheels B and D have 25 teeth and 40 teeth respectively, find the number of teeth on C and the speed and sense of rotation of C. (7)





Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME2203

II B.Tech II Semester Supplementary Examinations, November-2018.

APPLIED THERMODYNAMICS

(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is Heat loss factor?
- (b) Classify IC Engines.
- (c) Define Cetane number.
- (d) What is meant by Heat balance sheet.
- (e) Differentiate between Fan and blower.
- (f) Define Isentropic efficiency of an axial flow compressor.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) What is time loss factor? Discuss the effect of time losses in an actual cycle and explain the reasons for reduction in efficiency. [6 M]
- (b) Why the actual cycle efficiency is much lower than the air standard cycle efficiency? List the major losses in the actual engine. [6 M]
3. (a) What is the valve timing of 4 stroke engine? Explain its significance through a diagram. [6 M]
- (b) Describe the evaporative cooling system with a neat sketch. [6 M]
4. (a) Explain different stages of combustion in S.I. Engine along with p- θ diagram. [6 M]
- (b) What is diesel knock? How to minimize knocking in CI engine? [6 M]
5. (a) How to measure brake power of an engine by using rope brake dynamometer? Explain briefly. [6 M]
- (b) During the trial of a single-cylinder, four-stroke oil engine, the following results were obtained. Cylinder diameter = 20 cm, Stroke = 40 cm, Mean effective pressure = 6 bar, Torque = 407 Nm, Speed = 250 rpm, Oil consumption = 4 kg/h, Calorific value of fuel = 43 MJ/kg, Cooling water flow rate = 4.5 kg/min, Air used per kg of fuel = 30 kg, Rise in cooling water temperature = 45^o C , Temperature of exhaust gases = 420^o C, Room temperature = 20^o C, Mean specific heat of exhaust gas = 1 kJ/kg K, Specific heat of water = 4.18 kJ/kg K. Find the IP, BP, and draw up a heat balance sheet for the test in kJ/h. [6 M]
6. (a) What is positive displacement compressor? Explain the working principle of Vane sealed compressor. [6 M]

(b) Explain the working principle of Roots blower with suitable diagrams.

[6 M]

7. (a) Explain, with a neat sketch, the working of a centrifugal compressor and obtain an expression for the work done. [6 M]

(b) An axial flow compressor compresses air from an inlet condition of 1 bar and 290K to a delivery pressure of 5 bar with an overall isentropic efficiency of 87 per cent. The degree of reaction is 0.5 and the blade angles at inlet and outlet are 44° and 13° respectively. The mean blade speed and axial velocity are constant throughout the compressor. Assuming a blade velocity of 180 m/s, and work done factor 0.85, calculate the number of stages.

[6 M]



Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME2204

II B.Tech II Semester Supplementary Examinations, November-2018.

HYDRAULIC MACHINERY AND PNEUMATIC SYSTEMS

(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

- (a) Describe the efficiency of a jet striking a plate.
(b) Label (Draw) velocity triangle diagram for Pelton Wheel turbine.
(c) What are rotary pumps? Give examples.
(d) State the applications of pressure control valves.
(e) What is meant by fluid conditioner?
(f) write the classifications of pneumatic actuators.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

- (a) Derive an expression for a force exerted by the jet of water and efficiency of an unsymmetrical moving curved plate when jet strikes tangentially at one of the tips. 6Marks
(b) A jet of water having a velocity of 20 m/s strikes a curved vane which is moving with a velocity of 10 m/s. The jet makes an angle of 20° with the direction of motion of vane at inlet and leaves at angle 130° to the direction of motion of vane at outlet. Calculate i) vane angles so that water enters and leaves without shock ii) Work done per second. 6Marks
- (a) With a neat sketch explain the construction and working of a Francis turbine. 6Marks
(b) The head at the base of the nozzle of a Pelton wheel is 640 m. The outlet vane angle of the bucket is 15° . The relative velocity at the outlet is reduced by 15% due to friction along the vanes. If the discharge at outlet is without whirl find the ratio of bucket speed to the jet speed. If the jet diameter is 100 mm while the wheel diameter is 1.2 m, find the speed of the turbine in rpm, the force exerted by the jet on the wheel, the Power developed and the hydraulic efficiency. Take $C_v=0.97$. 6Marks
- (a) Discuss with a neat sketch the working of a single-acting reciprocating pump. Also obtain the expression for weight of water delivered by the pump per second. 6Marks
(b) The impeller of a centrifugal pump having external and internal diameters 500 mm and 250 mm respectively, width at outlet 50 mm and running at 1200 rpm works against a head of 48 m. The velocity of flow through the impeller is constant and equal to 3.0 m/s. The vanes are set back at an angle of 40° at outlet. Analyze:(i) Inlet vane angle (i) Work done by the impeller on water per second (iii) Manometric efficiency. 6Marks

5. What is an accumulator? State the application of accumulators. Explain the use of accumulator as leakage compensator with a hydraulic circuit? 12Marks
6. Draw the basic components of pneumatic systems and explain. 12Marks
7. Explain the functioning of the following switches with neat sketch? 12Marks
- i. Push button switches
 - ii. Pressure switches
 - iii. Limit switches
 - iv. Temperature switches.



Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16ME2205

II B.Tech II Semester Supplementary Examinations, November-2018.

MANUFACTURING TECHNOLOGY

(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define core and Core prints
- (b) Define 'Cold Shut' in relation to casting
- (c) What is the role of flux in welding?
- (d) Write the applications of Plasma Arc Welding
- (e) List any two components made by forging
- (f) Write the applications of Hydrostatic extrusion

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) What are different materials used for Pattern making? Write their merits and demerits [6]
- (b) Describe the steps in Shell moulding process with neat sketches [6]
3. (a) What are the requirements of a good gating system [6]
- (b) What is fettling of castings? Explain in detail [6]
4. (a) Explain various flames used in Oxy-Acetylene welding with diagrams [6]
- (b) How is an Arc obtained in Arc Welding? Explain the effect of polarity on Welding [6]
5. (a) Write short notes on (i) Soldering (ii) Brazing [6]
- (b) What is Thermit Welding? Explain [6]
6. (a) Explain the operations that are normally employed in Forging. [6]
- (b) Why the strength of Rolled Part is considered usually better than a Cast Piece [6]
7. (a) Explain the Hydrostatic Extrusion process with a suitable diagram [6]
- (b) Write about Tube drawing with a sketch [6]



Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2201

II B.Tech II Semester Supplementary Examinations, November-2018.

SWITCHING THEORY AND LOGIC DESIGN

(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

- (a) What is hamming code
(b) Simplify the following Boolean equation $F = ABC + ABC^1 + A^1B$
(c) Explain full adder.
(d) Define PLA and PAL
(e) Define rise time and fall time
(f) Distinguish between Moore and Mealy Machines

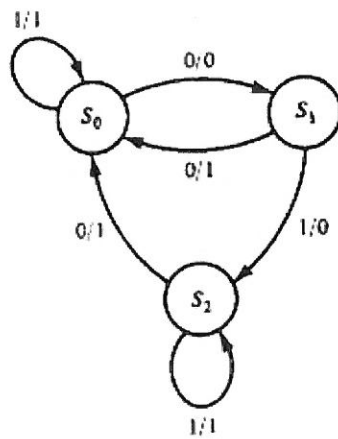
[2+2+2+2+2+2]

PART-B

4 X 12 = 48

- (a) Convert the following numbers in to decimal, binary and hexadecimal.
(i) $(2441)_8$ (ii) $(1556.77)_8$ (iii) $(2564)_8$ [6]
(b) Implement the logic circuit for the following Boolean expressions using NAND gates
 $F(a,b,c,d) = a'bd + a'c + bc$ [6]
- (a) Simplify the following function using the branching method. [6]
 $F(A, B, C, D, E) = \sum m(0, 4, 12, 16, 19, 24, 28, 29, 31)$
(b) Using K-map to simplify the following expression [6]
 $F = \sum m(0, 1, 2, 4, 5, 6, 9, 11, 14, 15) + d(10, 12, 13)$
Realize the simplified expression using NAND gates only.
- (a) Implement full subtractor by using half subtractors [6]
(b) Implement Boolean function using 8:1 MUX. [6]
 $F1 = \sum m(3, 4, 7, 8, 11, 14, 15)$ and $F2 = \sum m(1, 2, 4, 5, 7, 8, 10, 11, 12, 15)$.
- (a) List the major differences between PLA and PAL [6]
(b) Implement $f(A, B, C) = \sum(0, 1, 3, 5, 6)$ using PAL [6]
- (a) Draw the logic diagram of a SR latch using NOR gates. Explain its Operation. [6]
(b) Draw and explain 4-bit universal shift register [6]

7. (a) Design a circuit using D flip flop that implements the machine whose state diagram is given below. [8]



- (b) State the capabilities and limitations of finite state machine [4]



Subject Code: R16EC2202

II B.Tech II Semester Supplementary Examinations, November-2018.

ELECTRONIC CIRCUIT ANALYSIS

(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from **Part-B**

All questions carry equal marks of 12.

PART-A

1. (a) Define h-model of a transistor in a small signal amplifier.
(b) Write the elements of the Hybrid- π model?
(c) Three amplifiers of gain 10dB, 20dB and 30dB are connected together. Find the overall gain in dB.
(d) Compare negative feedback with the positive feedback?
(e) State Barkhausen criterion for Oscillation?
(f) What are the advantages of push pull power amplifiers

[2+2+2+2+2+2]

PART-B

2X 12 = 48

2. (a) Derive the expressions for voltage gain, current gain, input and output resistances of a Common Collector amplifier at low frequencies.
(b) Find A_v , A_i , Z_i and Z_o , for the transistor connected in CE configuration. Assume source resistance $R_s = 500\Omega$ and load resistance $R_L = 1\text{ k}\Omega$. Assume $h_{ie} = 1100\Omega$, $h_{fe} = 50$, $h_{re} = 2.4 \times 10^{-4}$ and $h_{oe} = 2.5\mu\text{ A/V}$.
3. (a) Derive the expressions for voltage gain, current gain, input and output resistances of a Common Drain amplifier at high frequencies.
(b) A single stage Common Emitter amplifier is measured to have a voltage-gain bandwidth f_H of 5 MHz with $R_L = 500\text{ ohm}$. Assume $h_{fe} = 100$, $g_m = 100\text{ mA/V}$, $r_{bb'} = 1000$, $C_c = 1\text{ pf}$, and $f_T = 400\text{ MHz}$. Find the value of the source resistance that will give the required bandwidth.
4. (a) Draw the circuit diagram of cascade amplifier circuit and analyze its performance.
(b) Draw and explain the emitter coupled differential amplifier.
5. (a) Explain types of feedback amplifiers?
(b) Discuss the effect of negative feedback with respect to closed loop gain, bandwidth and distortion.
6. (a) Draw the diagram of Colpitt's oscillator and explain its working.
(b)) What are the factors that affects the frequency stability of an oscillator? How frequency stability can be improved in oscillators?
7. (a) Derive the expression for efficiency of a direct coupled Class A power amplifier.
(b) A single transistor operates as an ideal class B amplifier. If d.c current drawn from the supply is 25mA, calculate the a.c power delivered to load for load of $2\text{K}\Omega$.



Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC2203

II B.Tech II Semester Supplementary Examinations, November-2018.

PULSE AND DIGITAL CIRCUITS

(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

- (a) Write the expression for the output of a low pass circuit excited by a symmetrical square wave?
(b) Define clamping circuit theorem and draw the circuit diagram for the positive clamper.
(c) Distinguish between comparators and clipping circuits.
(d) What do you mean by turn 'ON' time of a transistor?
(e) What are the applications of bistable multi vibrator?
(f) Write any two methods to generate a time-base waveform.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

- (a) Draw low pass RC circuit and explain its response to a square wave input.
(b) Draw high pass RC circuit and explain its response to a square wave input.
- (a) Explain negative and positive peak clippers with and without reference voltages.
(b) Draw the circuit diagram of negative clamper and explain its operation in detail.
- (a) How do you justify that the transistor acts as a switch.
(b) Explain the terms pertaining to transistor switching characteristics
i) Rise time ii) Delay time iii) Storage time and fall time
- (a) With the help of circuit diagram explain the working of collector coupled Monostable multivibrator.
(b) Derive an expression for the gate width T of a Monostable multivibrator neglecting the reverse saturation current I_{CBO} .
- (a) Draw the circuit diagram of collector coupled Astable multivibrator and explain its operation in detail.
(b) Derive an expression for the frequency of oscillation of the collector coupled Astable multivibrator.
- (a) Explain the Transistor Miller time –base generator in detail.
(b) Define the terms sweep speed error, displacement error, transmission error and write the relation between them.



Subject Code: R16EC2204

II B.Tech II Semester Supplementary Examinations, November-2018.

ANALOG COMMUNICATIONS

(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define modulation?
(b) Draw the spectrum of SSB modulated signal?
(c) What is wideband FM and Narrowband FM?
(d) Why pre-emphasis and de-emphasis are needed in F.M but not in A.M?
(e) A super heterodyne receiver having R.F amplifier is tuned to 555kHz .The local oscillator is adjusted to 1010kHz. Then calculate the Intermediate Frequency?
(f) Compare Continuous wave and pulse modulation technique.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain necessary expressions, waveforms and spectrums, Explain AM for an arbitrary baseband signal $m(t)$.
(b) A carrier wave of frequency 10 MHz and peak value of 10 V is amplitude modulated by a 5 KHz sine wave of amplitude 6 V. Determine the modulation index and draw the one sided spectrum of modulated wave.
3. (a) Explain the generation of double side band suppressed carrier (DSB-SC) modulator. Write the necessary equations.
(b) Find the percentage of power saved in SSB when compared with AM system.
4. (a) Explain the working of a balanced frequency discriminator with the help of circuit diagram.
(b) An FM signal is represented in time domain as $s(t) = 10 \cos(2\pi \cdot 10^6 t + 5 \sin 8\pi \cdot 10^3 t)$. Calculate the frequency deviation, modulation index, power and band width.
5. (a) Explain the noise performance of AM scheme with the help of block diagram
(b) Compare noise performance of PM and FM system.
6. (a) Explain the purpose and working of Tracking circuits.
(b) Draw the block diagram of Super heterodyne receiver and the function of each block.
7. (a) Explain the generation of PAM with neat block diagram.
(b) Write the comparisons among PAM, PWM and PPM.



Subject Code: R16EC2205

II B.Tech II Semester Supplementary Examinations, November-2018.

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) State Gauss's Law.
- (b) State Amperes Law.
- (c) Write the equation for V_{emf} of moving loop in time varying field.
- (d) Define uniform plane wave.
- (e) Explain the Surface Impedance.
- (f) Write about primary and secondary constants in transmission lines.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) A circular ring of radius 'a' carries uniform charge ρ_L C/m and is in xy-plane. Find the Electric Field Intensity at Point (0, 0, 3) along its axis.
- (b) Define electric potential. Two Point charges $Q_1=2nC$ and $Q_2=4nC$ are located at (1, 1, 1) and (1, 0, 0) respectively. Determine the potential at P(1,1,0) due to two point charges.
3. (a) Define Magnetic flux density and vector magnetic potential.
- (b) Find the magnetic field strength, H at the centre of a square conducting loop of side '2a' in Z=0 plane if the loop is carrying a current, I, in anti-clock wise direction.
4. (a) Derive Maxwell's equations in integral form and differential form for time varying fields.
- (b) A conducting circular loop of radius 20 cm lies in the z = 0 plane in a magnetic field $B = 10 \cos 377t \text{ az mWb/m}^2$. Calculate the induced voltage in the loop.
5. (a) State and Prove Poynting Theorem.
- (b) Find α, β, γ and η for Ferrite at 10GHz $\epsilon_r = 9, \mu_r = 4, \sigma = 10 \text{ ms/m}$.
6. (a) What is polarization of an EM wave? Distinguish between different types of polarizations?
- (b) Prove that the polarization is circular when the two components of electric field are equal and are 90° apart.
7. (a) Derive a relation between reflection coefficient and characteristic impedance.
- (b) Determine the reflection coefficients when
 - i. $Z_L = Z_0$
 - ii. $Z_L = \text{short circuit}$
 - iii. $Z_L = \text{open circuit}$.



Subject Code: R16EC2206

II B.Tech II Semester Supplementary Examinations, November-2018.

DATABASE MANAGEMENT SYSTEMS

(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define database schema.
- (b) What is Key constraint?
- (c) Explain about SELECT Command.
- (d) Define tuple.
- (e) Write note on DBMS Buffers.
- (f) What is Starvation?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Discuss about different types of Data models? [6M]
- (b) Explain briefly about the client server architecture of DBMS. [6M]
3. (a) Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set? [6M]
- (b) What is difference between aggregation and Inheritance? [6M]
4. (a) Discuss different types of aggregate operators with examples in SQL? [6M]
- (b) List the various types of SQL joins? [6M]
5. (a) Explain about different types of integrity constraints? [6M]
- (b) What is a NULL Value? Explain the importance of NULL Values. [6M]
6. (a) Distinguish between Single-User versus Multiuser Systems. [6M]
- (b) Define normalization? Explain 1NF, 2NF, 3NF Normal forms? [6M]
7. (a) Discuss Serializability in detail? [6M]
- (b) By considering an example, show how to reduce access time with primary index. [6M]



Subject Code: R16CS2201

II B.Tech II Semester Supplementary Examinations, November-2018.

STATISTICAL PROGRAMMING WITH R

(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of Part-A and Part-B.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define Poisson distribution and find mean of the Poisson distribution.
- (b) Explain Type-I and Type-II errors.
- (c) Write any two advantages and disadvantages of R.
- (d) Write the components of R functions.
- (e) Write test statistic for difference of means (small samples).
- (f) Write about linear vector algebra operations.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) For continuous probability function $f(x) = \begin{cases} cx(2-x), & \text{if } 0 \leq x \leq 2 \\ 0, & \text{Otherwise} \end{cases}$. Find (i) C (ii) Mean
(iii) Variance
- (b) The marks obtained in mathematics by 1000 students is normally distributed with mean 78 and standard deviation 11. Determine
 - (i) How many students got marks above 90
 - (ii) What is the highest mark obtained by lowest 10% of students?
 - (iii) With in what limits did the middle 90% of students lie.
3. (a) The mean and standard deviation of population are 11,795 and 14,504 respectively. If $n = 50$, find 95% confidence interval for the mean.
- (b) A normal population has mean of 0.1 and standard deviation of 2.1. Find the probability that mean of sample of size 900 will be negative.
4. (a) How to create matrix, delete rows, columns of matrix, naming matrix rows and columns? Give examples.
- (b) Write the use of apply function in R with examples.
5. (a) Write various control statements in R with syntax and examples
- (b) What is recursion? Write R code to generate Fibonacci series using recursion.

6. (a) A certain stimulus administered to each of 12 patients resulted in the following increase of blood pressure : 5,2,8,-1,3,0,-2,1,5 0,4,6. Can it be concluded that the stimulus will in general be accompanied by an increase in blood pressure.
- (b) From the following data test for equality of population variances.

Sample A	117	105	97	105	123	109	86	78	103	107
Sample B	106	98	87	104	116	95	90	69	108	85

7. (a) Write about functions for statistical distributions in R.
- (b) Describe R functions for reading a matrix from a file.



Subject Code: R16CS2202

II B.Tech II Semester Supplementary Examinations, November-2018.

OPERATING SYSTEMS

(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) List the functions of Real time Embedded system?
- (b) Explain benefits of multithreaded programming?
- (c) Define semaphores. Mention its importance in operating system?
- (d) Define swapping?
- (e) Explain safe state and unsafe state?
- (f) Describe about different types of disk scheduling?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Define an operating system? State and explain the basic functions or services of an

Operating system?

[6M]

- (b) Explain briefly system calls with examples?

[6M]

3. (a) Define Process? Explain about five types of process states.

[6M]

(b) Consider the following set of process that arrive at time 0, with the length of the CPU burst given in milliseconds Process Burst time.

PROCESS	ARRIVAL TIME	BURST TIME
P1	0	24
P2	0	3
P3	0	3

Calculate the average waiting time when the processes arrive in the following order:

- a) P1,P2,P3 and b) P2,P3,P1.

[6M]

4. (a) Explain the Readers and Writers problem and its solution using the concept of semaphores? [6M]

(b) State the requirements that a solution to the critical section problem must satisfy? [6M]

5. Consider the following page reference string 7,0,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0 Assuming three frames, how many page faults would occur in each of the following cases?

a) LRU b) FIFO c) Optimal algorithms [4M+4M+4M]

6. (a) Define deadlock? What are the four conditions necessary for a deadlock situation to arise? How it can be prevented? [6M]

(b) State and explain the methods involved in recovery from deadlocks? [6M]

7. (a) a) Explain the following file concepts:

i) File attributes

ii) File operations

iii) File types

[2M+2M+2M]

(b) Write short notes on Free Space Management.

[6M]



Subject Code: R16CS2203

II B.Tech II Semester Supplementary Examinations, November-2018.

FRONT END WEB TECHNOLOGIES

(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1.(a) Write the Structure of HTML.

(b) List out the rules for writing CSS.

(c) Write the syntax for Java Script.

(d) Define DTD? What are the types of DTD?

(e) What is method chaining in jQuery?

(f) Explain about Date picker?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain in detail about Working with Forms.

[6M]

(b) Explain in detail about Canvas with example?

[6M]

3. (a) What are Cascading Style Sheets? Explain with an examples.

[6M]

(b) What are the differences between Pseudo- Classes and Pseudo-Elements?

[6M]

4. (a) Discuss about JavaScript program for form validation.

[6M]

(b) Describe about Working with events in detail.

[6M]

5. (a) What is XML Namespaces with an example? Why DTD is required in XML?

[6M]

(b) Differentiate between DOM and SAX parser.

[6M]

6. (a) Discuss about the Arrays Utility Methods.

[6M]

(b) Explain about Selectors API in detail.

[6M]

7. Explain the following file concepts:

i) Custom Animation ii) Drag and Drop iii) Dialogue in jquery.

[4M+4M+4M]



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Subject Code: R16CS2204

II B.Tech II Semester Supplementary Examinations, November-2018.
DATABASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) List the advantages of DBMS?
- (b) Define Relationship and Relationship set?
- (c) Discuss the basic form of SQL query?
- (d) Define 2 NF (Second Normal Form).
- (e) What is Starvation?
- (f) List the operations of files?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Discuss about different types of Data models?[6M]
(b) Explain briefly about the client server architecture of DBMS. [6M]
3. (a) Explain about the characteristics of relational model? [6M]
(b) Explain operations on relational model in detail. [6M]
4. (a) Discuss different types of aggregate operators with examples in SQL? [6M]
(b) Explain the importance of Trigger in SQL. [6M]
5. (a) Compare and contrast BCNF with 3NF? [6M]
(b) What is a NULL Value? Explain the importance of NULL Values. [6M]
6. (a) Discuss briefly about Serializability in detail? [6M]
(b) Define a Transaction? List the properties of transaction. [6M]
7. (a) Compare and Contrast Extendible Hashing with Linear Hashing? [6M]
(b) Explain B+ trees? Discuss about this Dynamic Index Structure? [6M]



Subject Code: R16CS2205

II B.Tech II Semester Supplementary Examinations, November-2018.

SOFTWARE ENGINEERING

(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

- 1.(a) What is meant by Software and Software Engineering?
- (b) Explain briefly requirements elicitation.
- (c) Explain characteristics of good software design.
- (d) Explain black box testing.
- (e) What are software metrics and measurements?
- (f) List out Software Quality Assurance activities.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Discuss Waterfall model with suitable diagram. Give its merits and demerits. [6M]
(b) What are the challenges of software engineering? [6M]
3. (a) Explain briefly about requirements validation. [6M]
(b) Explain in detail about data oriented Analysis. [6M]
4. (a) What are the design principles? Explain in detail. [6M]
(b) Explain about structured design methodology. [6M]
5. (a) What are the differences between black box and white box testing? [6M]
(b) What are the principles of coding? [6M]
6. (a) What is project management? Explain in detail. [6M]
(b) What are effort estimation techniques? [6M]
7. (a) Explain in detail about capability maturity model. [6M]
(b) What is software maintenance? Explain in detail. [6M]



Narasaraopeta Engineering College (Autonomous)

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Subject Code: R16CS2206

II B.Tech II Semester Supplementary Examinations, November-2018.

PROFESSIONAL ETHICS, VALUES AND PATENTS

(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is Civic Virtue
- (b) List out role of Engineer
- (c) Write a short note on Whistle blowing
- (d) Compare Innovations and Inventions
- (e) Explain Type of Intellectual Properties
- (f) Define Trademark

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Define the term Human Value. Explain why human values are important for engineers.
3. (a) Extend Engineer role as Managers
- (b) Elucidate Engineer role as Consultants
4. (a) Elaborate Professional Right and Responsibilities of Engineers in organisations.
5. (a) Describe Intellectual Property Law
- (b) Explain ethical obligations in Intellectual Property Law
6. (a) Give a detail account about Copyright and explain Copyright formalities in registration.
7. (a) Write a note on Post registration process of Trademarks.
- (b) Compare and contrast between Cyber Law and Cyber crime
