



Subject Code: R16CC31OE11

III B.Tech I Semester Regular Examinations, November-2018.
PRINCIPLES OF WATER QUALITY MANAGEMENT (OPEN ELECTIVE-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 is meant by riparian rights
- b) What is virtual water?
- c) What is the difference between structural measure and non structural measure?
- d) Define irrigation efficiency
- e) What is rehabilitation?
- f) State the full forms of WHO and BIS

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

PART-B

4 X 12 = 48

2. (a) Explain the problems and perspectives regarding water infrastructure
(b) Explain water laws in details
3. (a) Discuss the principles of water pricing and water allocation
(b) Describe the sustainability principles for water management-frame work for planning a sustainable water future
4. (a) Explain recycling and reuse of water
(b) Explain the use of geo informatics for flood management
5. (a) Differentiate consumptive and non consumptive demands
(b) Discuss the water demand estimation for domestic and industrial sector
6. (a) Explain the water requirements for environmental management
(b) Discuss the direct/indirect benefits of water resources development
7. (a) Explain the use of model tree technique in water resources planning-development & management
(b) Discuss in detail the Biological analysis of water

Subject Code: R16CE3101

III B.Tech I Semester Regular Examinations, November-2018.

STRUCTURAL ANALYSIS-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) Sketch the BMD for the fixed beam subjected to central Point load.
- (b) Calculate the strain energy stored in an axially loaded member of 10000mm^2 of length 3m subjected to an axial tensile force of 10000kN. Take $E=2 \times 10^5 \text{ N/mm}^2$.
- (c) Write the clapeyron's theorem of three moments
- (d) Write the generalised slope deflection equations
- (e) Define Distribution Factor.
- (f) What are the Causes for Sway in portal frames?

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

PART-B

4 X 12 = 48

2. A cantilever of length 4m carries a UDL of 1kN/m run over the whole span length. The cantilever is propped rigidly at the free end. If the value of $E=2 \times 10^5 \text{ N/mm}^2$ and $I=10^8 \text{ mm}^4$, Determine the reaction at the rigid prop and draw SFD and BMD by Consistent Deformation Method

3. Analyse the Propped Cantilever beam of span 5m subjected to 20 kN/m over half of the length from fixed end by Strain Energy method. Draw BMD also.

4. Using Clapeyron's method finds the support moments for the two span continuous beam loaded as shown below Fig . 1. Sketch the B.M.D.

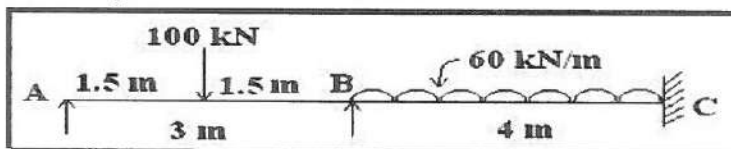


Fig.1

5. Analyze two span continuous beam ABC(Fig.2) in which support B sinks by 5mm by slope deflection method. Then draw Bending moment & Shear force diagram. Take EI constant and draw Elastic curve.

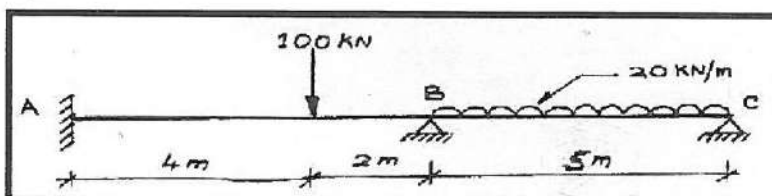


Fig.2

6. Using moment distribution method, analyse the two span continuous beam ABC, having end supports A and C fixed. There is a load of 5 kN in span AB=5 m at 3 m from A, while on span BC there is a load of 8 kN at 2.5 m from C. Sketch the B.M.D.

7. Analyse the portal frame shown in Fig.3 by using Moment distribution method and draw BMD?
All members have the same flexural rigidity.

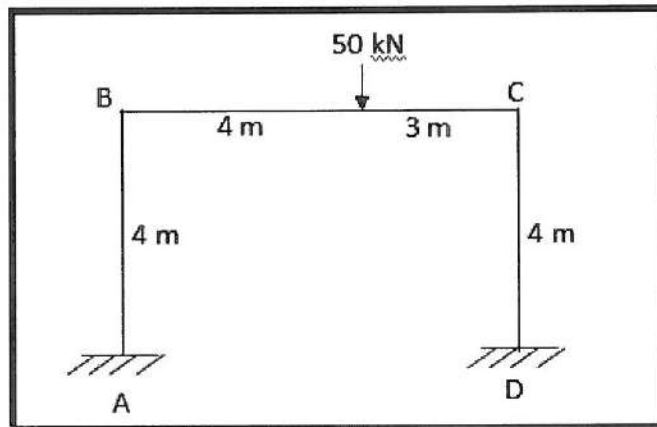


Fig.3



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III B.Tech I Semester Regular Examinations, November-2018.

CONCRETE TECHNOLOGY

(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) List types and grades of cement.
- (b) List tests on coarse aggregates
- (c) List types of Admixtures
- (d) Explain about Creep of concrete?
- (e) Write briefly about Quality Control of concrete
- (f) What is meant by Self-compacting concrete

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

PART-B

4 X 12 = 48

2. (a) What is meant by Standard Consistency Test ? [6M+6M]
- (b) What are the initial and final setting times of cement? What is their importance
3. (a) List out various tests to measure workability of concrete.
- b) List Mechanical Properties of Aggregates and Explain any one. [6M+6M]
4. (a) What are super plasticizers? How are these helpful in modifying the properties of concrete?
- b) What are the factors Effecting the Workability. What are the site Problems in the use of super plasticizers? [6M+6M]
5. (a) Explain Concept of Mix Design.
- b) What is meant by Non-destructive test. [6M+6M]
6. a) Define creep. Explain factors affecting on creep
- (b) Discuss briefly about Sulphate attack [6M+6M]
7. (a) Explain the Properties and applications of special concretes
- (b) Explain about Self-compacting concrete [6M+6M]



Subject Code: R16CE3103

III B.Tech I Semester Regular Examinations, November-2018.

GEOTECHNICAL ENGINEERING-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) Define void ratio and porosity and Write the relation between void ratio and porosity.
- b) Write the Index Properties of soil.
- c) Define Darcy's law.
- d) Write the types of head and explain any one.
- e) List the factors affecting on compaction of soil.
- f) List the shear strength experiment names and Write down the shear strength properties of soil.

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

PART-B

4 X 12 = 48

2. (a) Derive relationships among Unit Weight, Void Ratio, Moisture Content, and Specific Gravity.
- (b) A sample of saturated soil has a water content of 25 percent and a bulk unit weight of 18 kN/m^3 . Determine dry density, void ratio and specific gravity of solid particles. What would be the bulk unit weight of the same soil at the same void ratio but at a degree of saturation of 85%. Take $\gamma_w = 10 \text{ kN/m}^3$
3. (a) Explain about Atterberg Limits
- (b) The mass of an empty glass jar was 0.698 kg. When completely filled with water, its mass was 1.728 kg. An oven dried sample of soil of mass 0.398 kg was placed in the jar and water was added to fill the jar and its mass was found to be 1.953 kg. Determine the specific gravity of particles.
4. (a) What are the factors affecting permeability of soil and explain any two.
- (b) Explain the phenomena of capillarity and surface tension.
5. (a) Define total stress and effective stress. What are the seepage forces.
- (b) Find intensity of vertical pressure at a point 3 m directly below 25 kN point load acting on a horizontal ground surface. What will be the vertical pressure at a point 2m horizontally away from the axis of loading and at same depth of 3 m? Use Boussinesq's equation

6. (a) The maximum dry density of a sample by the light compaction test is 1.78 g/ml at an optimum water content of 15%. Find the air voids and the degree of saturation, $G=2.67$.
- (b) Define the terms: Coefficient of compressibility, Coefficient of volume change & Compression index
7. (a) Describe direct shear test. What are its merits and demerits?
- (b) A sample of dry cohesionless soil was tested in a triaxial machine. If the angle of shearing resistance was 36° and the confining pressure, 100 kPa, determine the deviator stress at which the sample failed.



Subject Code: R16CE3104

III B.Tech I Semester Regular Examinations, November-2018.

DESIGN AND DRAWING OF CONCRETE STRUCTURES

(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 Modular ratio and write assumptions in limit state design
- (b) What is meant by characteristic strength of a material as used in IS 456.
- (c) What do you understand by the term Anchorage?
- (d) How to decide short and long columns
- (e) List the types of footings.
- (f) What is the minimum percentage of steel to be provided in slabs

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

PART-B

4 X 12 = 48

2. (a) Compare 'Working stress method' and limit state design of RCC structures.
- (b) A rectangular reinforced concrete beam has to support a design moment of 45 kNm. Determine the area of reinforcement required if the beam dimension is 150 x 315 mm (bxd), concrete strength $f_{ck} = 25 \text{ kN/mm}^2$ and steel strength $f_y = 500 \text{ N/mm}^2$

3. (a) Find the effective depth based on the deflection criteria of a cantilever beam of 6m span. Take $f_y = 415 \text{ N/mm}^2$, $P_t = 1\%$, $P_c = 1\%$.
- (b) Reinforced concrete beam is to be designed over an effective span of 5.5 m to support a design service live load of 6kN/m. Adopt M20 grade concrete and Fe415 HYSD bars and design the beam to satisfy the limit states of collapse of serviceability.

4. (a) (a) What is development length? (or) What do you understand by development length of bar?
- (b) A R.C.C beam 230mm wide and 450mm deep is reinforced with 4 NO.s of 16 mm diameter bars of grade Fe415, on the tension side with an effective cover of 50mm. If the shear reinforcement of 2 legged 8 mm stirrups at a spacing of 150 mm c/c is provided at a section, determine the design (ultimate) strength of the section. Assume M20 concrete has been used.

5. Design the reinforcements in a short column 400 mm X 600 mm subjected to an ultimate axial load of 1600 kN together with ultimate moments of 120 kN.m and 90 kN.m about the major and minor axis respectively. Adopt M-20 grade concrete and Fe-415 HYSD bars. Sketch the reinforcement details.

6. Design an RC footing for a 300 mm thick concrete wall that carries a service load (inclusive of dead load) of 330 kN/m. The allowable soil pressure, q_a , is 240 kN/m² at a depth of 1.5 m below ground. Assume M20 concrete and Fe 415 steel.
7. The slab of a residential building of size 4.3 m × 6 m is simply supported on all the four sides on 230 mm walls. Assuming an imposed load of 2 kN/m² and load due to finishes of 1.0 kN/m², design the floor slab. Use M25 concrete and Fe 415 steel. Assume mild exposure.



Subject Code: R16CE3105

III B.Tech I Semester Regular Examinations, November-2018.

TRANSPORTATION ENGINEERING-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) Write about different types of roads depending on whether conditions.
- (b) Write any four factors affecting the friction or skid resistance.
- (c) Define traffic volume, speed and density.
- (d) Mention different tests on bitumen.
- (e) Write about different types of pavements and define them.
- (f) Discuss briefly about types of Overlay.

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

PART-B

4 X 12 = 48

2. (a) Explain the salient features of the second 20-year road development plan? [6+6]
- (b) Explain about various factors affecting the highway alignment?
3. (a) Explain the factors affecting highway geometric design? [4+8]
- (b) Calculate the minimum sight distance required to avoid a head-on collision of two cars approaching from the opposite directions at 100 and 65 kmph. Assume a reaction time of 2.5 seconds, coefficient of friction of 0.7 and a brake efficiency of 50 percent, in either case.
4. (a) Explain about the causes of accidents and their preventive measures? [4+8]
- (b) The average normal flow of traffic on cross roads A and B during design period are 500 and 360 PCU per hour, the saturation flow values on these roads are estimated as 1600 and 1200 PCU per hour respectively. The all red time required for pedestrian crossing is 14 seconds. Design two phase traffic signal by Webster's method?
5. (a) Explain in detail about the Marshall Method of bituminous mix design? [8+4]
- (b) Explain about the desirable properties of road aggregates?

6. (a) Explain in detail about the factors to be considered in design of pavements? [4+8]
- (b) Compute the stresses at interior, edge and corner regions of a cement concrete pavement using westergaard's stress equations. Use the following data Wheel load, $P = 5400\text{kg}$, Modulus of elasticity of concrete, $E = 3 \times 10^5 \text{ kg/cm}^2$, Radius of contact area, $a = 16\text{cm}$, Pavement thickness, $h = 22\text{cm}$, Poisson's Ratio, $\mu = 0.15$. Modulus of subgrade reaction, $K = 5.8 \text{ kg/cm}^3$.
7. (a) Describe the construction procedure of earthen roads? [6+6]
- (b) Explain briefly about various pavement evaluation methods?



Subject Code: R16EE3101

III B.Tech I Semester Regular Examinations, November-2018.

POWER SYSTEM TRANSMISSION LINES

(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) Explain the importance of a bundled conductor?
(b) Explain why the capacitance is neglected in short transmission lines?
(c) Why Ferranti effect occurs in a transmission line?
(d) What is meant by power system transient?
(e) What are the factors which affect corona loss?
(f) What are the advantages of suspension insulators?

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

PART-B

4 X 12 = 48

- (a) Derive the expression for the inductance of a 3 phase double circuit line with symmetrical spacing?
(b) Determine the capacitance of single-phase transmission line when earth effect is considered.
- (a) Define regulation of a short 3-phase transmission system and develop an expression for approximate voltage regulation.
(b) A 3-phase, 50Hz transmission line has conductors of section 90 mm^2 and effective diameter of 1 cm and are placed at the vertices of an equilateral triangle of side 1 metre. The line is 20 km long and delivers a load of 10MW at 33kV and p.f 0.8. Neglect capacitance and assume temperature of 20°C . Determine the efficiency and regulation of the line.
- (a) Derive equations which represent the performance of a long transmission line with its electrical parameters uniformly distributed along its length.
(b) Explain clearly the "Ferranti effect" with a phasor diagram.
- (a) Discuss the phenomenon of wave reflection and refraction. Derive expressions for reflection and refraction coefficients.
(b) Explain the variation of current and voltage on an overhead line when one end of the line is short circuited and at the other end a source of constant e.m.f V is switched on.
- (a) Derive the expression for most economical power factor for constant kW demand
(b) Find the critical disruptive voltage and the critical voltages for local and general corona on a 3-phase overhead transmission line, consisting of three stranded copper conductors spaced 2.5 m apart at the corners of an equilateral triangle. Air temperature and pressure are 21°C and 73.6 cm Hg respectively. The conductor dia, irregularity factor and surface factors are 10.4 mm, 0.85, 0.7 and 0.8 respectively.
- (a) Derive the expressions for sag and tension when the supports are at unequal heights.
(b) A string of eight suspension insulators is to be fitted with a grading ring. If the pin to earth capacitances is all equal to C, find the values of line to pin capacitances that would give a uniform voltage distribution over the string.



Subject Code: R16EE3102

III B.Tech I Semester Regular Examinations, November-2018.

**POWER 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

1. (a) Define Holding current of an SCR?
- (b) Define the delay angle of phase controlled rectifier?
- (c) What are the advantages of three phase controlled rectifier?
- (d) What are the applications of AC voltage controller?
- (e) Draw the circuit diagram of step down chopper?
- (f) What is PWM? List out various techniques?

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

PART-B

4 X 12 = 48

2. (a) Explain the constructional details of an SCR?
- (b) Discuss the comparison between MOSFET and SCR?
3. A single phase full converter is supplied from 230V, 50 HZ source. The load consists of $R = 10$ ohm and a large inductance so as to render the load current constant. For a firing angle delay of 30° , determine i) Average output voltage ii) Average output current iii) Average value of thyristor current iv) power factor
4. (a) Explain the comparison between circulating current mode and non-circulating current mode of dual converter
- (b) Draw and explain the operation of three phase half controlled bridge converter?
5. A single phase full wave controller feeds power to a resistance load of 100 ohm from a 230V, 50 HZ supply. Calculate i) RMS output voltage ii) input power factor iii) half cycle average current at delay angles $\alpha_1 = \alpha_2 = \alpha = \frac{\pi}{2}$ of both thyristors?
6. (a) Describe the principle of DC chopper operation?
- (b) In a step down chopper, the input voltage is 230V DC, the load voltage is 150V. If the chopping frequency is 5 KHZ. Find chopping period and blocking period of the chopper?
7. (a) Explain the principle of operation of single phase full bridge inverter?
- (b) Write short notes on sinusoidal PWM technique?



Subject Code: R16EE3103

III B.Tech I Semester Regular Examinations, November-2018.

ELECTRICAL MEASUREMENTS

(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) Define ratio and phase angle errors in instrument transformers
- (b) What is Phantom loading?
- (c) Distinguish between DC and AC type potentiometer
- (d) Why is the Wheatstone bridge not suitable for measuring low resistance?
- (e) What is a ballistic galvanometer? Where is it used?
- (f) Explain the functions of a ramp type digital voltmeter?

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

PART-B

4 X 12 = 48

2. (a) Describe with neat sketch, the constructional details of a moving coil instrument and explain how control and damping forces are controlled.
(b) A 1000/5, 50 Hz current transformer has a secondary burden comprising a non inductive burden of 1.6 Ω . The primary winding has 1 turn. Calculate the flux in the core and current ratio error at full load. Neglect leakage reactance and assume the iron loss in core to be 1.5 W at full load.
3. (a) Explain the operation of dynamometer type single phase power factor meter
(b) Explain the working of Induction type single phase Energy meter with a neat diagram.
4. (a) Explain the term “standardization“ of a potentiometer. Describe the procedure of standardization of a DC Potentiometer
(b). Explain the operation of coordinate type AC potentiometer
5. (a) For Anderson’s bridge, derive the relation for unknown impedance. What are the advantages and limitations of this bridge?
(b) The four arms of a Hay’s bridge are arranged as follows: AB is a coil of unknown impedance; BC is a non-reactive resistor of 1000 Ω ; CD is a non- reactive resistor of 833 Ω in series with a standard capacitor of 0.38 μ F; DA is non-reactive resistor of 16800 Ω . If the supply frequency is 50 Hz, determine the inductance and the resistance at the balanced conditions.
6. (a) Explain the method of reversals for a magnetic specimen in finding out B-H loop..
(b) Discuss the measurement of core losses by using potentiometer method?
7. (a) Explain the working of successive approximation DVM with a neat sketch
(b) Explain the basic circuitry of cathode ray oscilloscope



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Subject Code: R16EE3104

III B.Tech I Semester Regular Examinations, November-2018.

MICROPROCESSOR AND MICROCONTROLLERS

(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) How many addressing lines does an 8086 have? (2 M)
 - (b) Differentiate minimum mode and maximum mode operations in 8086. (2 M)
 - (c) What is the advantage of using CPU registers for temporary data storage over using a memory location. (2 M)
 - (d) Define direct memory access operation (DMA). (2 M)
 - (e) What is the size of internal RAM in 8051. (2 M)
 - (f) Write an application in which micro-controller is preferred over microprocessor. (2 M)
- [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain segmented memory model of 8086. (6 M)
- (b) Explain pipe line mechanism in 8086. (6 M)
3. (a) Explain different addressing modes of 8086. (6 M)
- (b) Explain the following instructions of 8086 i) CMPS, ii) INT, iii) XCHG (6 M)
4. (a) Write an assembly language program to arrange N 8-bit numbers in a descending order. (6 M)
- (b) Explain interrupt mechanism of 8051 microcontroller. (6 M)
5. (a) Explain the need of PPI (8255) in microprocessor based systems. Discuss control word register of 8255A. (6 M)
- (b) Explain the interfacing of programmable interrupt controller with 8086 microprocessor. (6 M)
6. (a) Explain mode 1 serial communication in 8051. (6 M)
- (b) Discuss IE and IP function registers in 8051. (6 M)
7. (a) Explain the interfacing of DAC with 8051 microcontroller. (12 M)



Subject Code: R16EE3105

III B.Tech I Semester Regular Examinations, November-2018.

SIGNALS AND SYSTEMS

(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) Distinguish between energy and power signals. (2 M)
 - (b) What is odd symmetry? How does it help in simplification of Fourier series? (2 M)
 - (c) What are the conditions to be satisfied for the existence of Fourier transform. (2 M)
 - (d) Define (a) Static system (b) Dynamic system. (2 M)
 - (e) Explain aliasing effect. (2 M)
 - (f) Explain convolution property of Fourier transform. (2 M)
- [2+2+2+2+2+2]**

PART-B

4 X 12 = 48

2. (a) Explain analogy between vectors and signals. (6 M)
- (b) Show that complex exponential sequence $x[n] = e^{j\omega_0 n}$ is periodic only if $\frac{\omega_0}{2\pi}$ is a rational number. (6 M)
3. (a) Derive the expressions for trigonometric Fourier series coefficients. (6 M)
- (b) Find the exponential Fourier series for the signal $x(t) = A \sin(\omega_0 t)$. (6 M)
4. (a) State and prove time shifting and frequency shifting properties of Fourier transform. (6 M)
- (b) Find the Fourier transform of the function $x(t) = [u(t+2) - u(t-2)] \cos(2\pi t)$. (6 M)
5. (a) State and explain the conditions for distortionless transmission through a system. (6 M)
- (b) The impulse response of a continuous system is expressed as $h(t) = e^{-2t} u(t)$. Find the frequency response of the system. (6 M)
6. (a) State and prove sampling theorem for low pass signals. (6 M)
- (b) Determine the Nyquist rate for the following signals:
i) $x_1(t) = \cos^2(\omega_0 t)$
ii) $x_2(t) = \text{sinc}^2(300\pi t)$ (6 M)
7. (a) Show that autocorrelation and PSD form a Fourier transform pair. (6 M)
- (b) Verify Parseval's theorem for the energy signal $x(t) = e^{-3t} u(t)$ (6 M)



Subject Code: R16EE3106

III B.Tech I Semester Regular Examinations, November-2018.

**RENEWABLE ENERGY SOURCES
(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 solar concentrators?
- (b) List the applications of solar pond?
- (c) What are the basic components of wind energy conversion system?
- (d) State the requirements of economic viability of a geothermal power plant?
- (e) Define peltier Coefficient?
- (f) What is the Magneto-hydro-dynamic generator?

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

PART-B

4 X 12 = 48

2. Explain the following a) Solar radiation at the Earth's surface b) Solar radiation and sunshine
3. Write short notes on a) solar heating b) Photo voltaic energy conversion
4. (a) Discuss the principle of wind energy conversion?
(b) Explain the horizontal and vertical axis windmills?
5. (a) What are the potentials of geothermal resources in India?
(b) Explain the various components of tidal power plant?
6. (a) Derive the expression for Carnot efficiency?
(b) Explain the thermo electric materials?
7. (a) Explain the basic principle of operation of a MHD generation?
(b) What are the advantages of MHD systems?



Subject Code: R16ME3101

III B.Tech I Semester Regular Examinations, November-2018.

METAL CUTTING AND MACHINE TOOLS

(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 tool life?
- b) Distinguish between capstan lathe and turret lathe?
- c) Mention the difference between shaper and planner?
- d) What is meant by up milling and down milling?
- e) What is the need of truing and dressing operations in grinding wheel?
- f) What is the difference between jig and fixture?

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

PART-B

4 X 12 = 48

2. (a) Explain the geometry of a single point cutting tool with suitable sketches?
(b) Explain various cutting tool materials? [7+5]
3. (a) Explain various taper turning methods?
b) Discuss the features of ram type and saddle type turret? [8+4]
4. (a) What operations can be done on a drilling machines? Discuss them with diagrams.
(b) What is boring? Sketch a boring tool. [8+4]
5. (a) Explain various types of milling operations using neat sketches?
(b) What is indexing? describe direct indexing with example. [8+4]
6. (a) Briefly discuss about the different types of abrasives used in a grinding wheel?
(b) Explain centreless grinding process with neat diagram? [6+6]
7. Discuss in detail the principles employed in jigs and fixtures design? [12]



Subject Code: R16ME3102

III B.Tech I Semester Regular Examinations, Nov – 2018

HEAT POWER ENGINEERING

(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 are the methods to improve performance of Rankine cycle?
 - (b) Enumerate the differences between Natural and artificial draught.
 - (c) What is critical pressure ration in Nozzles?
 - (d) Explain principle of Reaction turbine
 - (e) What are the functions of steam condensers in steam power plant?
 - (f) What are different operating variables affect the thermal efficiency of gas turbine power plant?
- [2+2+2+2+2+2]**

PART-B

2. (a) What are the methods to improve performance of Rankine cycle? Explain reheating in detail.
 - (b) A steam turbine consumes 9 kg/kW-hr when steam is supplied at a pressure of 10 bar and at 400° C. The exhaust takes place at 0.1bar. Compare the efficiency of the engine with the Rankine efficiency.
- [4M+8M]**
3. (a) Write detailed classification of boilers, Explain Construction and Working of Cochran boiler.
 - (b) What are Boiler Accessories and Mountings Explain with neat figures?
- [8M+4M]**
4. (a) Derive the equation for mass discharge through a nozzle.
 - (b) Steam having pressure of 10.5 bar and 0.95 dryness is expanded through a convergent divergent nozzle and the pressure of steam leaving the nozzle is 0.85 bar. Find the velocity at the throat for maximum discharge conditions. Index of expansion may be assumed as 1.135 bar. Calculate mass rate of flow of steam through the nozzle.
- [4M+8M]**
5. In an impulse turbine, mean diameter of blades is 1.05m and the speed is 3000 rpm. The nozzle angle is 18°, the ratio of blade speed to steam speed is 0.42 and blade velocity coefficient is 0.85. The outlet blade angle is 3° less than that of the inlet blade angle. Steam flow rate is 20kg/sec. Obtain: i) Tangential thrust on blades ii) Axial thrust on blades iii) Resultant thrust iv) Power developed v) Blade efficiency
- [12M]**

6. (a) Classify the condensers and explain anyone surface condenser with neat sketch.

(b) A surface condenser is designed to handle 10000 kg of steam per hour. The steam enters at 0.08 bar abs, and 0.9 dryness and the condensate leaves at the corresponding saturation temperature. The pressure is constant throughout the condenser, Estimate the cooling water flow per hour, if the cooling water temperature rise is limited to 10 °C [4M+8M]

7. A gas turbine unit receives the air at 100KPa and 300K, and compresses it adiabatically to 620KPa with efficiency of the compressor 88% . The fuel has heating value of 44,180KJ/kg and the fuel/air ratio is 0.017kg fuel/kg air. The turbine efficiency is 90%. Calculate the compressor work, turbine work and thermal efficiency. [12M]



Subject Code: R16ME3103

III B.Tech I Semester Regular Examinations, November-2018.

MACHINE DYNAMICS AND VIBRATIONS

(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 are the various types of friction experienced by a body?
- (b) Which of the two assumptions-uniform intensity of pressure or uniform rate of wear, would you make use of in designing friction clutch and why?
- (c) What are the various types of the brakes.?
- (d) Why is balancing of rotating parts necessary for high speed engines?
- (e) What is the difference between free and forced vibrations.
- (f) What is meant by a torsionally equivalent length of a shaft as referred to stepped shaft?

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

PART-B

4 X 12 = 48

2. (a) Derive from first principles an expression for the effort required to raise a load with a screw jack taking friction into consideration.
 - (b) A square threaded screw of mean diameter 25mm and pitch of thread 6mm is utilised to lift a weight of 10kN by a horizontal force applied at the circumference of the screw. Find the magnitude of the force if the coefficient of friction between the nut and screw is 0.12.
3. A car engine has its rated output of 12 kW. The maximum torque developed is 100 N-m. The clutch used is of single plate type having two active surfaces. The axial pressure is not to exceed 85 kN/m². The external diameter of the friction plate is 1.25 times the internal diameter. Determine the dimensions of the friction plate and the axial force exerted by the springs. Coefficient of friction = 0.3.
4. A simple band brake operates on a drum of 600 mm in diameter that is running at 200 RPM. The coefficient of friction is 0.25. The brake band has a contact of 270°, one end is fastened to a fixed pin and the other end to the brake arm 125 mm from the fixed pin. The straight brake arm is 750 mm long and placed perpendicular to the diameter that bisects the angle of contact.
 - a) What is the pull necessary on the end of the brake arm to stop the wheel if 35 kW is being absorbed? What is the direction for this minimum pull?
 - b) What width of steel band of 2.5 mm thick is required for this brake if the maximum tensile stress is not to exceed 50 N/mm²?

5. A rotating shaft carries four masses A , B , C and D which are radially attached to it. The mass centres are 30 mm, 38 mm, 40 mm and 35 mm respectively from the axis of rotation. The masses A , C and D are 7.5 kg, 5 kg and 4 kg respectively. The axial distances between the planes of rotation of A and B is 400 mm and between B and C is 500 mm. The masses A and C are at right angles to each other. Find for a complete balance,
- The angles between the masses B and D from mass A ,
 - The axial distance between the planes of rotation of C and D ,
 - The magnitude of mass B .
6. a) What are the various types of vibrations?
 b) Derive the natural frequency of free longitudinal vibrations of systems having single degree of freedom by equilibrium method.
7. A steel shaft ABCD 1.5m long has flywheel at its ends A and D . The mass of the flywheel A is 600kg and has a radius of gyration of 0.6 m. The mass of the flywheel D is 800 kg and has a radius gyration of 0.9m. The connecting shaft has a diameter of 50mm for the portion AB which is 0.4m long :and has a diameter of 60mm for the portion BC which is 0.5m long: and has a diameter of d for the portion CD which is 0.6m long. Determine
- The diameter d of the portion CD so that the node of the torsional vibration of the system will be at the centre of the length BC and
 - The natural frequency of the torsional vibrations.
 - Take modulus of rigidity for the shaft material as 60 GN/m^2

Subject Code: R16ME3104

III B.Tech I Semester Regular Examinations, November-2018.

PRINCIPLES OF MACHINE DESIGN

(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

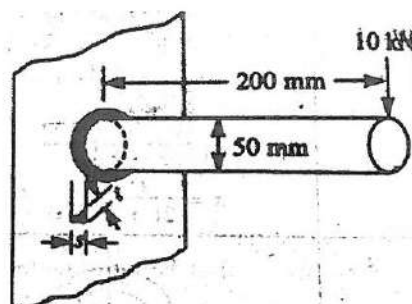
1. (a) Define machine design.
- (b) What is stress concentration?
- (c) What is the difference between caulking & fullering?
- (d) What do you understand by lateral and torsional rigidity?
- (e) Differentiate between rigid and flexible coupling?
- (f) Write any two functions of springs?

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

PART-B

4 X 12 = 48

2. (a) Discuss briefly design cycle? (6M)
- (b) Define factor of safety and write importance of factor of safety in design? (6M)
3. (a) An automobile leaf spring is subjected to cyclic stress such that the average stress is 150Mpa, variable stress is 350Mpa; the material properties are; ultimate strength = 400Mpa; yield strength = 350Mpa; endurance limit = 270Mpa; estimate the factor of safety using Goodman method and Soderberg method? (8M)
- (b) What is the difference between Gerber curve, Soderberg and Goodman lines? (4M)
4. (a) Explain the various failures of riveted joints with neat sketches. (6M)
- (b) A 50mm diameter solid shaft is welded to a flat plate as shown in fig. If the size of weld is 15mm, find the maximum normal and shear stress in the weld. (6M)



5. (a) Design a socket & spigot cotter joint to connect two mild steel rods for a pull of 30 kN. The maximum permissible stresses are 55Mpa in tension, 40Mpa in shear and 70 Mpa in crushing. Draw a neat sketch of the joint designed. (6M)
- (b) Design a hollow shaft to transmit 20 kW at 300rpm. The loading is such that the maximum bending moment is 1000 N-m, the maximum torsional moment is 500 N-m and axial compressive load is 15 kN. The shaft is supported on rigid bearings 1.5 m apart. The maximum permissible shear stress on the shaft is 40 Mpa. The inside diameter is 0.8 times the outside diameter. (6M)
6. Design and draw a cast iron protective flange coupling to transmit 15kW at 900 rpm from an electric motor to a compressor. The service factor may be assumed as 1.35. The following permissible stresses may be used: (12M)
- Shear stress for shaft, bolt and key material = 40 N/mm²
- Crushing stress for bolt and key = 80 N/mm²
- Shear stress for cast iron = 8 N/mm²
7. (a) It is required to design a helical compression spring for the valve mechanism. The axial force acting on the spring is 300 N when the valve is open and 150 N when the valve is closed. The length of the spring is 30mm when the valve is open and 35mm when the valve is closed. The ultimate tensile strength of the spring material is 1370 N/mm². The permissible shear stress for spring wire may be taken as 30% of the ultimate tensile strength. The modulus of rigidity is 81.37 GPa. The spring is to be fitted over a valve rod and the minimum inside diameter of the spring should be 20mm. design the spring. (8M)
- (b) Discuss about Concentric Springs. (4M)



Subject Code: R16ME3105

III B.Tech I Semester Regular Examinations, November-2018.

OPERATIONS RESEARCH

(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 do you mean by i) Feasible solution ii) Optimal solution
- (b) How do we solve unbalanced transportation problem
- (c) Explain the principle of dominance.
- (d) Explain maximin and minimax principles.
- (e) Explain project crashing?
- (f) What are the limitations of simulation?

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

PART-B

4 X 12 = 48

2. (a) How the degeneracy is resolved in LPP?
- (b) Use simplex method to solve

[4M]

$$\text{Maximize } Z = 5x_1 + 3x_2$$

Subject to the constraints

$$x_1 + 2x_2 \leq 2$$

$$5x_1 + 2x_2 \leq 10$$

$$3x_1 + 8x_2 \leq 12$$

$$x_1, x_2 \geq 0$$

[8M]

3. (a) Find the optimal solution to the following transportation problem

[8M]

	D ₁	D ₂	D ₃	D ₄	Supply
O ₁	23	27	16	18	30
O ₂	12	17	20	51	40
O ₃	22	28	12	32	53
Demand	22	35	25	41	

- (b) Write a short notes on assignment maximization problem [4M]
4. (a) A book binder has one printing press, one binding machine and the manuscripts of a number of different books. The time required performing printing and binding operations for each book are shown below. Determine the order in which books should be processed in order to

minimize the total time required to turn out all the books. Also find the idle time for both the machines. [12M]

Book	1	2	3	4	5
Processing time(mts)	40	90	80	60	50
Binding time(mts)	50	60	20	30	40

5. On an average 96 patients per 24 hour day require the service of an emergency clinic. Also on average, a patient requires 10 minutes of active attention. Assume that the facility can handle only one emergency at a time. Suppose that it costs the clinic Rs.100 per patient treated to obtain an average servicing time of 10 minutes, and that each minute of decrease in this average time would cost Rs. 10 per patient treated, how much have to be budgeted by the clinic to decrease the average size of the queue from $1\frac{1}{3}$ patient to $\frac{1}{2}$ patient. [12M]

6. (a) Using dominance principle to simplify the rectangular game with the following pay of matrix, and solve it graphically [12M]

		Player B			
		I	II	III	IV
Player A	I	18	4	6	4
	II	6	2	13	7
	III	11	5	17	3
	IV	7	6	12	2

7. (a) Discuss in brief, replacement procedure for the items that deteriorate with time [4M]
 (b) The initial cost of an item is Rs 15000 and maintenance and running cost (in Rs) for different years are given below:

Year	1	2	3	4	5	6	7
Running cost	2500	3000	4000	5000	6500	8000	10000

What is the replacement policy to be adopted if the capital worth is 10% and there is no salvage value? [8M]



Subject Code: R16CC31OE4

III B.Tech I Semester Regular Examinations, November-2018.

INDUSTRIAL ELECTRONICS (OPEN ELECTIVE-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. (a) Sketch the forward and reverse bias characteristics of Diode?
- (b) Write the working principle of controlled rectifier?
- (c) Give the list of applications of ultra Sonics?
- (d) Define the term welding?
- (e) State the need for industrial automation?
- (f) Give the classification of control systems?

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

PART-B

4 X 12 = 48

2. (a) Describe the energy level and energy band diagram?
- (b) Explain the working of PNP and NPN transistors?
3. (a) Explain the construction and working of SCR?
- (b) Write list of applications of DIAC, TRIAC and SCR?
4. (a) Explain the working principle, construction and applications of resistance strain gauge?
- (b) Explain the construction and working of pulsed-echo ultrasonic flow detector?
5. (a) Discuss the HF power source for induction heating?
- (b) Explain the principle of resistance welding?
6. State the need for PLC and explain the PLC system with block diagram?
7. (a) Explain the open loop control system with some examples?
- (b) Give the list of merits and demerits of open loop control?



Subject Code: R16EC3101

III B.Tech I Semester (Regular/supple) Examinations, (Month, Year)

LINEAR AND DIGITAL IC APPLICATIONS

(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) What is the significance of offset in Op – Amps?
(b) Write a formulae for the 16 bit ADC resolution? And what it the step value?
(c) Draw an All Pass Filter circuit with Op – Amp and passive components.
(d) Which flip-flop used to make frequency division very easily and why?
(e) List any 3 libraries used in VHDL program coding and write syntax reading values.
(f) Draw an AND gate with diode and transistor logic. [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the concept of level translator with Op-amp and also derive the output of differential amplifier circuit.
(b) Draw a practical Op-amp differentiator circuit and explain the frequency response with neat sketch.
3. (a) Draw the R-2R ladder DAC circuit and explain why the inverted R-2R ladder DAC used in low power integrated circuits?
(b) Explain the functional description of Mono-stable operation of 555IC timer with input and output waveforms (hint: 1ms time period and 2 V_{pp} can be considered).
4. (a) What is the PLL importance in FSK demodulator with the neat sketch/block diagram?
(b) Derive the transfer function of Band Pass Filter (BPF) with schematic and also give frequency response characteristics of BPF using band labels.
5. (a) Draw the full/static CMOS logic for the below function $F = \overline{((A+B+C)*D)}$ and also discuss strength of static CMOS logic.
(b) What is TTL logic family and draw totem-pole/active pullup circuit with help of diodes?
6. (a) What is encoder and priority encoder? Also give truth table of 8 to 3 bit priority encoder with its schematic diagram.
(b) Design the counter – IC 74X163 and explain, discuss application of counter in various real time fields.
7. (a) Draw and explain internal structure & timing waveforms of synchronous SRAM neatly.
(b) Write VHDL programme for the 4 bit multiplier and 2 bit comparator with detailed logic.



Narasaraopeta Engineering College (Autonomous)

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

Subject Code: R16EC3102

III B.Tech I Semester Regular Examinations, November-2018.

DIGITAL 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

- (a) Define Sampling Theorem.
(b) Write advantages and disadvantages of DPSK.
(c) Differentiate between optimum filter and matched filter.
(d) Define entropy along with its properties.
(e) Discuss Hamming codes.
(f) Write about Convolution Codes.

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

PART-B

4 X 12 = 48

- (a) Draw the block diagram of PCM scheme. Explain each block. 6M
(b) Describe the principle of delta modulation with the relevant block diagram and waveforms. 6M
- (a) Draw the modulation waveforms for transmitting binary information over base band channels, for the modulation schemes ASK, PSK, FSK. 6M
(b) Explain the working of QPSK with the help of neat block diagrams. 6M
- (a) What is of matched filter? How it differs from optimum filter? Derive an expression for impulse response and probability of error for matched filter. 6M
(b) What is coherent PSK? Derive the probability of bit error in PSK. 6M
- (a) Derive the expression for mutual information and describe its properties. 6M
(b) Consider five messages given by the probabilities 1/2, 1/4, 1/8, 1/16, 1/16. 6M
 - Calculate H (2M)
 - Use Shannon-Fano algorithm to develop an efficient code and for that code, calculate the average number of bits/message. Compare with H. (4M)
- (a) Draw the (n-k) syndrome calculation circuit for (n, k) cyclic code and Explain. 6M
(b) Design an encoder for the (7, 4) binary cyclic code generated by $g(x) = 1 + x + x^3$ and verify its operation using the message vector (0 1 0 1). 6M
- (a) Briefly describe the Code tree, Trellis and State Diagram for a Convolution Encoder. 6M
(b) Draw Code Tree and State diagram for rate 1/2 convolutional encoder with Constraint length 3 and generator sequences $g_1=(1,1,1)$ and $g_2=(1,0,1)$. 6M

Subject Code: R16EC3103

III B.Tech I Semester Regular Examinations, November-2018.

ANTENNA AND WAVE PROPAGATION

(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** Directivity and Gain.
- (b) **Define** reciprocity theorem
- (c) **List** advantages and disadvantages of binomial array.
- (d) **Discuss** applications of Parabolic antennas
- (e) **Define** "Zoning".
- (f) **Define** Critical Frequency and MUF.

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

PART-B

4 X 12 = 48

2. (a) **Explain** about two wire Radiation Mechanism with a diagram?
- (b) **Explain** about Current Distribution on a thin wire antenna?
3. (a) **Derive** the field components and rms power radiated from half wave dipole. Calculate the radiation resistance of a half wave dipole.
- (b) **Write** the comparison of far fields of small loop and short dipole?
4. (a) **Find** the radiation pattern of four isotropic elements fed in phase, spaced $\lambda/2$ apart by using pattern multiplication
- (b) **Design** a Yagi-Uda antenna of six elements to provide a gain of 12dBi if the operating frequency is 200MHz?
5. (a) **Explain** about travelling wave radiators and its radiation patterns.
- (b) If a helical antenna has a spacing between turns 0.05m, diameter 0.1m, number of turns equal to 20 and operates at 1000MHz. **Find** the BWFN and HPBW, Directivity D?
6. (a) **Explain** about microstrip patch antennas and its applications.
- (b) **What** is an optimum horn? Sketch and explain its characteristics, along with the dimensional relations.
7. (a) **Derive** the Fundamental Equation for Free-Space Propagation?
- (b) **Discuss** the salient features of sky wave propagation. Bring out the various problems associated with this mode of propagation. How are these problems overcome?



Narasaraopeta Engineering College (Autonomous)

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

Subject Code: R16EC3104

III B.Tech I Semester Regular Examinations, November-2018.

COMPUTER ORGANIZATION AND MICROPROCESSORS

(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) What is the advantage of 2's complement over 1's complement? (2 M)
- (b) What is immediate addressing mode? (2 M)
- (c) Is 8086 microprocessor has RISC or CISC architecture? Justify. (2 M)
- (d) Compare hardwired model and microprogrammed model of CPU. (2 M)
- (e) What is the role of Bus interface unit (BIU) in 8086? (2 M)
- (f) What is the difference between a macro and a subroutine? (2 M)

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

PART-B

4 X 12 = 48

2. (a) Discuss different types of integer representation's and their conversions with examples. (6 M)
- (b) List out widely used bus standards in computer system. Discuss their advantages and disadvantages. (6 M)
3. (a) List the steps needed to execute the machine instructions given below in terms of transfer between the components of processor, memory and control signals (6 M)
i) MOV R0, R1 ii) ADD [LOCA], R0
- (b) Discuss following addressing modes with an example. i) Indirect addressing mode, ii) Stack addressing mode. (6 M)
4. (a) What is virtual memory? Explain the procedure for translating virtual address to physical address. (6 M)
- (b) What is cache? Explain any two cache mapping functions with diagrams. (6 M)
5. (a) Explain pipelined architecture of 8086 microprocessor with a neat sketch. (6 M)
- (b) Discuss any 2 string manipulation instructions of 8086. (6 M)
6. (a) Explain how stack memory is managed in 8086 with stack related instruction set. (6 M)
- (b) Explain the differences between subroutine and interrupt subroutine. Write the steps involved in the executions of interrupt subroutine. (6 M)
7. (a) Explain control word of 8255 in detail. (6 M)
- (b) Write a program to interface stepper motor to 8086 microprocessor. (6 M)



Narasaraopeta Engineering College (Autonomous)

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

Subject Code: R16CC31OE6

III B.Tech I Semester Regular Examinations, November-2018.

AUTOMOTIVE ELECTRONICS (OPEN ELECTIVE-I)

(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) List four (4) elements of the automobile physical configurations.
(b) Draw a very common diode circuit of half wave rectifier.
(c) What is the task of microcomputer in automobile system?
(d) Define fuel economy and expand MPG in automobile engines.
(e) How fuel injection happens in electronic automobile system?
(f) Why transmission control used and how it works?

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

PART-B

4 X 12 = 48

- (a) Explain use of electronics in automobile, also list present and potential electronics application in automobiles.
(b) What are the major components of fundamental engine? and explain piston concept and cooling system.
- (a) Draw the 4 bit digital adder and denote sum S for A (a_1, a_2, a_3) & B (b_0, b_1, b_2, b_3) inputs.
(b) Derive the summing amplifier output V_o , and draw neat circuit using Op-amp.
- (a) With a neat circuit diagram explain Digital to Analog converter.
(b) Explain microcomputer applications in automotive systems.
- (a) Explain the concept of electronic engine control system in mathematical terms.
(b) With the block diagram help, explain the electronic distributor-less ignition system.
- (a) Draw and explain mass air flow sensor concept along with calibration curve.
(b) List various types of sensor and explain about Hall Effect position sensor.
- (a) What are technical improvements can be expected in future and explain them.
(b) what is multiplexing in automobiles and brief about control signal multiplexing with block diagram.



Subject Code: R16CS3101

III B.Tech I Semester Regular Examinations, November-2018.

DESIGN AND ANALYSIS OF ALGORITHMS

(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 out algorithm specifications.
- (b) What is divide and conquer technique?
- (c) Write the control abstraction for greedy method
- (d) Define feasible and optimal solution
- (e) Define backtracking
- (f) What are the methods of Branch and bound techniques?

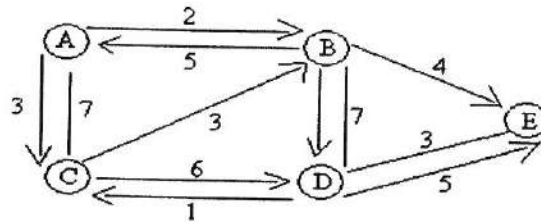
[2+2+2+2+2+2]

PART-B

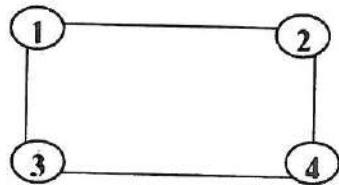
4 X 12 = 48

2. (a) Define Time complexity and Space complexity. Write an algorithm for matrix addition and show the step table to estimate total steps for the problem.
- (b) Explain in detail about Asymptotic Notations with example.
3. (a) Explain the general method of Divide and Conquer. Solve the recursive relation using substitution method.
- (b) write merge sort algorithm and develop computing time as a recursive relation to find $T(n)$.
4. (a) . Find an optimal solution to the knapsack instance $n=7, m=15, (p_1, p_2, p_3, \dots, p_7) = (10, 5, 15, 7, 6, 18, 3)$ and $(w_1, w_2, w_3, \dots, w_7) = (2, 3, 5, 7, 1, 4, 1)$ using greedy approach.
- (b) Explain Kruskal's algorithm to construct Minimum cost spanning tree.
5. (a) Construct the Optimal Binary Search Tree for the identifier set $(a_1, a_2, a_3) = (\text{do}, \text{if}, \text{read})$ with $P(1:3) = (3, 3, 1)$ $Q(0:3) = (2, 3, 1, 1)$ and compute the time complexity of function OBST.

- (b) Find the shortest path b/w all pairs of nodes in the following graph and explain with the suitable algorithm



6. (a) Explain the Sum of Sub Sets problem with example?
 (b) Explain the Graph coloring problem, draw the portion of the state space tree generated for the graph given below by procedure M Coloring



7. (a) Apply the Branch and Bound algorithm to solve the TSP, for the following cost matrix.

$$\begin{bmatrix}
 \infty & 11 & 10 & 9 & 6 \\
 8 & \infty & 7 & 3 & 4 \\
 8 & 4 & \infty & 4 & 8 \\
 11 & 10 & 5 & \infty & 5 \\
 6 & 9 & 5 & 5 & \infty
 \end{bmatrix}$$

- (b) Explain 0/1 knapsack problem solving technique using LCBB.



Subject Code: R16CS3102

III B.Tech I Semester Regular Examinations, November-2018.
OOAD THROUGH UML

(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 Explain in detail about Modeling.
- b Define Class and Object Diagrams?
- c Compare and contrast Usecase and Activity Diagrams.
- d Explain about Interactions
- e Illustrate the significance of Modeling Logical database schema .
- f Explain Deployment Diagrams.

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

PART - B

4 X 12 = 48

2. a Construct Basic Structural Modeling and Advanced Structural Modeling.
- b Explain briefly about SDLC?
3. a Utilize the need of Interaction Diagram? Explain Modeling a Flow of Control by Time Ordering.
- b Identify the significance of Class Diagram? Explain the Common Modeling techniques.
4. a Construct Object Diagrams with Forward and Reverse Engineering.
- b Identify the significance of Interactions and apply the Common Modeling Techniques with a neat diagram.
5. a Analyze Basic behavioral modeling with an example.
- b Infer the Forward and Reverse engineering in Activity diagrams.
6. a Apply Events and Signals in handling Exceptions
- b Build State chart diagram with Reactive Objects.
7. a Construct Component Diagrams with common Modeling Techniques.
- b Make use of Deployment Diagram in the construction of Client/Server System.



Subject Code: R16CS3103

III B.Tech I Semester Regular Examinations, November-2018.

COMPILER DESIGN

(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 ambiguous grammar? Give an example.
- (b) Give the Regular Expression examples for Formal Languages.
- (c) Explain in brief the role of Parser.
- (d) Write syntax directed translation scheme for infix to postfix conversion.
- (e) Illustrate the principal sources of optimization techniques.
- (f) Why loop optimization is so important than other code optimization?

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

PART-B

4 X 12 = 48

2. (a) Explain the different stages of compiler design.
- (b) Show the sequence output of each phase of a compiler for the following code segment

```
int x=5, y=10, z; z=x+y*5; printf("%d", z);
```

3. (a) Describe the steps for predictive parser.
- (b) Construct Right most derivation for the grammar $E \rightarrow E+T|T$, $T \rightarrow T*F|F$, $F \rightarrow (E)|id$ for

$w = id + id * id .$

4. Explain in detail about peephole optimization.
5. Construct CLR parsing for the following grammar

$S \rightarrow CC$

$C \rightarrow cC|d$

6. (a) Describe about various representations of symbol table.
- (b) What is activation record? Explain the structure of an activation record.

7. Give the directed acyclic Graph Representation of Basic Blocks with an example



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Subject Code: R16CS3104

III B.Tech I Semester Regular Examinations, November-2018.

COMPUTER NETWORKS

(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

- (a) Explain why protocols are needed.
(b) What are cyclic codes ?
(c) Explain how throughput is improved in slotted ALOHA over pure ALOHA ?
(d) What is flooding ?
(e) Define piggybacking and write its uses.
(f) Explain the need of uniform resource locator in WWW.

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

PART-B

4 X 12 = 48

- (a) What are the different layers of OSI? Explain briefly the functions of each layer.
(b) Explain the advantages of layered architectures.
- (a) What are the services provided to the Network Layer by Data Link Layer? Explain.
(b) What is framing. Explain different framing techniques.
- (a) Explain in detail about the sliding window protocol using Selective Repeat.
(b) Explain briefly about CSMA/CD.
- (a) Compare and contrast a virtual circuit and packet-switched network.
(b) With a suitable example explain Distance Vector Routing algorithm. What is the serious drawback of Distance Vector Routing algorithm? Explain.
- (a) Explain how a connection is established in a Transport Protocol.
(b) Discuss the differences between TCP and UDP.
- (a) With neat sketch explain the formats of generic messages in HTTP. How security is provided for HTTP messages.
(b) Explain Domain Naming System.



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Subject Code: R16CS3107

III B.Tech I Semester Regular Examinations, November-2018.
SOFTWARE REQUIREMENTS AND ESTIMATION
(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 Requirement Engineering?
- (b) Explain Requirement management principles.
- (c) List the problems in Software Estimation.
- (d) What is Productivity?
- (e) Illustrate the significance of requirement management tool.
- (f) Explain SLIM

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

PART-B

4 X 12 = 48

2. (a) Discuss the essential of Software Requirements. [4M]
{(b) Explain Risk Management in relation to Software Requirements. [8M]
3. (a) Explain Traceability Matrix and Links in requirements chain. [5M]
{(b) What is Usecase? Explain the Data Flow diagram with an example. [7M]
4. (a) Discuss Components of Software Estimation. [5M]
{(b) Explain Function Point Analysis with suitable example. [7M]
5. (a) Describe Approaches to Effort and Schedule Estimation. [6M]
(b) Explain Putnam Estimation Model. [6M]
6. (a) Discuss the benefits of using requirements management tool. [5M]
(b) How do you implement requirements management automation? [7M]
7. (a) What are the desirable features in software estimation tools [5M]
(b) Discuss COCOMO II with suitable example. [7M]
