Code : 13CS4102

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

ARTIFICIAL INTELLIGENCE
(Computer Science & Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1 a) Define in your own words: (a) intelligence, (b) artificial intelligence, (c) agent, (d) rationality, (e) logical reasoning
b) Is AI a science, or is it engineering? Or neither or both? Explain.

2 a) Define in your own words the following terms: agent, agent function, agent program, rationality, autonomy, reflex agent, model-based agent, goal-based agent, utility-based agent, learning agent.
b) Write pseudocode agent programs for the goal-based and utility-based agents.

SECTION - II

3 a) Explain why problem formulation must follow goal formulation
b) Define in your own words the following terms: state, state space, search tree, search node, goal, action, transition model, and branching factor.

4 a) What's the difference between a world state, a state description, and a search node? Why is this distinction useful?
b) Prove each of the following statements, or give a counterexample:
a. Breadth-first search is a special case of uniform-cost search.
b. Depth-first search is a special case of best-first tree search.

SECTION - III

5 a) Consider the problem of placing k knights on an n × n chessboard such that no two knights are attacking each other, where k is given and $k \leq n2$
a. Choose a CSP formulation. In your formulation, what are the variables?
b. What are the possible values of each variable?
c. What sets of variables are constrained, and how?
b) Explain why it is a good heuristic to choose the variable that is most constrained but the value that is least constraining in a CSP search.

6 a) What is the worst-case complexity of running AC-3 on a tree-structured CSP?
b) Define in your own words the terms constraint, backtracking search, arc consistency, backjumping, min-conflicts, and cycle cutset.

SECTION - IV

7 a) Which of the following are valid (necessarily true) sentences?
a. $(\exists x\ x = x) \Rightarrow (\forall\ y\ \exists z\ y = z)$. b. $\forall\ x\ P(x) \vee \neg P(x)$.
c. $\forall\ x\ Smart(x) \vee (x = x)$.

b) Explain First-order logic two standard quantifiers- universal and existential.

8 a) Explain about assertions and queries in first order logic.

b) Describe how to build logical agents in the Wumpus world environment using Propositional logic.

SECTION - V

9 a) Explain The ADABOOST variant of the boosting method for ensemble learning and how it works

b) Write an algorithm for finding a minimal consistent determination and explain

10 a) Explain version space learning approach with its drawbacks

b) Would a probabilistic version of determinations be useful? Suggest a definition.

Code : 13ME4102

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

CAD / CAM
(Mechanical Engineering)

Time: 3 hours | Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 Briefly explain the conventional process of the product cycle in the conventional manufacturing environment.

2 Explain 3-D scaling, rotation, reflection and translation with suitable example?

SECTION - II

3 What is Wire frame modeling? Explain the properties of Bezier curve?

4 Discuss in detail about the following :
(i) Curve Representation (ii) Surface Representation

SECTION - III

5 Write the differences between NC and CNC. Mention G Codes and M Codes in detail.

6 Explain the APT statements:
i) GOTO and GO/TO ii) GODLTA and GOBACK and iii) INTOL and OUTTOL.

SECTION - IV

7 What are the different types of manufacturing systems? Explain with characteristics of each

8 Define the term Robotics? Mention its specific application in Automobile Industry.

SECTION - V

9 What are the merits and demerits of acceptance sampling in CAQC?

10 Define CIM? Explain the role of Management in CIM

Code : 13EC4102

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

RADAR ENGINEERING

(Electronics & Communication Engineering)

Time : 3 hours Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

1 (a) With neat diagram, explain the block diagram of conventional pulse radar with a super heterodyne receiver ?

(b) Write the frequency bands with their nomenclature?

2 (a) Derive the equation for false-alarm-time(T_{fa})

(b) What is range ambiguity? Explain.

SECTION - II

3 (a) A two cavity klystron amplifier has the following parameters.
Beam voltage = 1000 V, Beam current = 25 mA, frequency = 3 G Hz,
gap spacing in either cavity = 1mm, spacing between center of cavities = 4 cm, effective shunt impedance = 30 k Ω.
Determine
(i) The electron velocity
(ii) The DC transit time of electron
(iii)The input voltage for maximum output voltage
(iv)The voltage gain in decibels

(b) Describe the principle of operation for a normal circular Magnetron and list its characteristics.

4 (a) Explain the significance of Mixers in Radar Receivers.

(b) Compare and Contrast Branch type and Balanced type Duplexers.

SECTION - III

5 (a) Explain the following: i). Aperture efficiency ii). Polarisation

(b) Explain about feed mechanisms of a parabolic reflector antenna.

6 (a) Write notes on Electronically Steered Phased Array Antennas.

(b) Discuss about the basic configuration of a digital beam forming receiving array.

SECTION - IV

7 (a) Using a block diagram, explain the operation of a CW radar.

(b) Explain the butterfly effect in MTI radar?

8 (a) Explain with neat block diagram, "Monopulse Amplitude Tracking Radar"

(b) What is the need of AGC circuit in tracking radar systems? Explain the working principle of AGC circuit?

SECTION - V

9 (a) Explain in detail about surface clutter.

(b) Enumerate the properties of sea and land clutter.

10 (a) Explain the mechanism of detection of targets in sea.

(b) Briefly discuss Angle Echoes.

Code : 13EE4114

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

POWER SEMICONDUCTOR DRIVES

(Electrical & Electronics Engineering)

Time : 3 hours Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION – I

1 Explain parts of Electric drives with respective diagrams.

2 (a) What are the different types of electrical drives and explain briefly.

(b) What are the advantages of electric drives?

SECTION – II

3 Explain the operation of a separately excited dc motor supplied from single-phase fully controlled rectifier with necessary diagrams. Assume Continuous conduction.

4 Describe different braking methods employed for D.C. motors.

SECTION – III

5 Explain the operation of a separately excited dc motor supplied from 3-phase Semi controlled rectifier with necessary diagrams. Assume Continuous conduction.

6 Explain the operation of a four quadrant chopper fed to the D.C series motor and also draw the current and voltage wave forms for continuous current operation.

SECTION – IV

7 (a) Discuss briefly the stator voltage control scheme of induction motor. Also draw and explain the speed torque curves.

(b) Compare VSI and CSI operation of induction motor drives

8 The rotor resistance and stand still reactance referred to stator of a 3 phase, 4 pole, 50 Hz Squirrel cage Induction motor is 0.2 ohm and 0.8 ohm per phase respectively. The full load slip of the motor is 4 percent. Neglect stator resistance and leakage reactance. Determine how much stator voltage should be reduced in order to get a speed of 1200 rpm if the load torque remains constant.

SECTION – V

9 Draw the circuit diagram and explain the working of a slip power recovery system using Static Kramer drive for a three phase induction motor.

10 (a) Explain the operation of Load commutated CSI fed Synchronous motor drive.

(b) Draw the block diagram of a closed loop synchronous motor drive fed from VSI.

Code : 13CE4102

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

IRRIGATION & HYDRAULIC STRUCTURES
(Civil Engineering)

Time: 3 hours Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All questions carry equal marks
* * *

1 (a) Explain the different functions of irrigation water.

(b) What are the benefits accrued form from irrigation projects?

2 (a) What do you understand by crop rotation? What are its advantages?

(b) What are the factors effecting duty? How the duty can be improved?

SECTION - II

3 (a) Define initial regime, permanent regime. State the Lacey's regime equations. Derive an expression for Lacey's scour depth from regime equations.

(b) Design an Irrigation canal to carry a discharge of 1.4 cumecs by using Kennedy's theory. Assume N =0.225, m=1, and B/D = 5.7. (The sides of the Trapezoidal shaped canal are ½: 1).

4 (a) What is water logging? What are the causes and ill-effects of water logging?

(b) Design a concrete lined channel to carry a discharge of 45 cumecs at a slope of 1 in 10,000. The side of the channel are $1\frac{1}{4}$:1 and Manning's N may be taken as 0.018.

SECTION - III

5 Explain with help of a diagram, the various component parts along with their functions of a Diversion Head work?

6 (a) Discuss in brief various causes of failure of weirs and their remedies.

(b) Explain Khosla's method of independent variables.

SECTION - IV

7 (a) Discuss in brief various modes of failure of a gravity dam.

(b) What do you understand by the elementary profile of a gravity dam?

8 (a) What are the factors on which the selection of the site for a dam depends?

(b) Explain various types of dams? What do you understand by multi-purpose reservoir?

SECTION - V

9 What is a siphon spillway? Sketch a saddle siphon spillway and explain the functions of its various component parts.

10 (a) Discuss various methods used for energy dissipation below spillways.

(b) Explain the design procedure for the standard stilling basin type I.

Code : 13CE4104

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech I Semester

CONSTRUCTION PLANNING & MANAGEMENT
(Civil Engineering)

Time: 3 hours Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION – I

1. a) Write in brief about the six functions of construction management.
   b) How do you prepare construction schedules and records?

2. a) Explain the resources involved in construction industries.
   b) Explain the construction team and stages of construction management.

SECTION – II

3. Explain in detail about advanced scheduling techniques and its merits and demerits.

4. Draw the network. Estimate the event times; find out the critical path and completion time of the project whose activities are given below: Use the forward and backward process in tabular format to calculate event time strictly.

   Note: A, B, C, D, E and F are events (nodes) in his case

Activity	Duration (in Days)	Preceding activity
A-B	7	---
B-C	10	A-B
B-D	15	A-B
C-D	7	B-C
C-E	12	B-C
D-E	3	B-D,C-D
E-F	5	C-E,D-E

SECTION – III

5. a) List out various types of Dozers with advantages and disadvantages?

   b) Explain concrete handling equipment available in construction field?

6. a) List the various pressure grouting equipments and discuss any two with their suitability?

   b) Write various excavation equipments used for civil projects?

SECTION – IV

7. What do you understand by Quality Control in Construction industry? How it helps in good quality of workmanship.

8. Explain in detail about how quality control is being achieved by using different statistical tools.

SECTION – V

9. List the various safety measures you suggest for a multistoried building.

10. State the merits and demerits of a functional organization for a medium construction projects.

Code : 13SH4102

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

MANAGEMENT SCIENCE

(Common for EEE, ECE & CSE)

Time : 3 hours Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

1 (a) Define Management. Explain the functions of Management in detail.

(b) Explain the social responsibility of business towards different segments of society.

2 Explain Henri Fayol's 14 principles of management in detail.

SECTION - II

3 (a) Define the following :
(i) Mission (ii) Goals iii) Policies

(b) Define Corporate planning. Explain steps involved in corporate planning process.

4 (a) Explain the principles of good plant layout.

(b) Define Product layout. Explain the advantages and limitations of Product layout.

SECTION - III

5 (a) Define Human Resource Management. Explain the functions of HRM in brief.

(b) What do you mean by Job Evaluation? Explain different methods used to conduct Job Evaluation.

6 (a) What do you mean by Merit Rating? Explain different methods used to conduct Merit Rating to rate the employees in the organization.

(b) Define Marketing. Distinguish between Marketing and Selling.

SECTION - IV

7 (a) Distinguish between Method study and time study.

(b) Define the following :
(i) Job production (ii) Batch production iii) Mass production

8 (a) Explain different methods of calculating Overhead charges.

(b) Distinguish between Straight line and Diminishing balance method of depreciation.

SECTION - V

9 (a) Write a short note on
a) Activity
b) Event
c) Dummy activity

(b) Explain in detail the rules for drawing network diagram.

10 (a) Briefly write a note on PERT & its time estimates. How do you calculate the expected time in PERT?

(b) CPM always involves in a trade - off between Cost & Time. Discuss. Support your answer with an suitable example.

Code : 13ME4104

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

MACHINE DYNAMICS AND VIBRATIONS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 Figure 1 shows a slider-crank mechanism. The value of force applied on slider 4 is 3, 000 N. Determine the forces on various links. Also calculate the driving torque T_2.

2 The crank and connecting rod of a vertical petrol engine, running at 1,800 *rpm* are 60 *mm* and 270 *mm* respectively. The diameter of the piston is 100 *mm* and the mass of the reciprocating parts is 1.2 *kg*. During the expansion stroke when the crank has turned 20^0 from the top dead centre, the gas pressure is 650 kN/m^2. Determine the

(i) Net force on the piston
(ii) Net load on the gudgeon pin
(iii)Thrust on the cylinder walls and
(iv) Speed at which the gudgeon pin load is reversed in direction

SECTION - II

3 A cam, with a minimum radius of 25 mm, rotating clockwise at a uniform speed is to be designed to give a roller follower, at the end of a valve rod, motion described below:

a. To raise the valve through 50 mm during 120° rotation of the cam
b. To keep the valve fully raised through next 30°
c. To lower the valve during next 60° and
d. To keep the valve closed during rest of the revolution i.e. 150°

The diameter of the roller is 20 mm and the diameter of the cam shaft is 25 mm. Draw the profile of the cam when the line of the stroke is offset 15 mm from the axis of the cam shaft. The displacement of the valve, while being raised and lowered, is to take place with simple harmonic motion.

4 A cam drives a flat reciprocating follower in the following manner :
During first 120° rotation of the cam, follower moves outwards through a distance of 20 mm with simple harmonic motion. The follower dwells during next 30° of cam rotation. During next 120° of cam rotation, the follower moves inwards with simple harmonic motion. The follower dwells for the next 90° of cam rotation. The minimum radius of the cam is 25 mm. Draw the profile of the cam.

SECTION - III

5 Four masses A, B, C and D are completely balanced as shown in Figure 2. Masses C and D make angles of 90° and 195° respectively with that of mass B in the counterclockwise direction. The rotating masses have the following properties:

$m_b = 25\ kg$ $r_a = 150\ mm$
$m_c = 40\ kg$ $r_b = 200\ mm$
$m_d = 35\ kg$ $r_c = 100\ mm$
$r_d = 180\ mm$

Planes *B* and *C* are 250 mm apart. Determine the

a. mass *A* and its angular position with that of mass *B* and
b. positions of all the planes relative to planes of mass *A*

6 The three cranks of a three cylinder locomotive are all on the same axle and are set at 120°. The pitch of the cylinders is 1 m and the stroke of each piston is 0.6 m. The reciprocating masses are 300 kg for inside cylinder and 260 kg for each outside cylinder and the planes of rotation of the balance masses are 0.8 m from the inside crank. If 40% of the reciprocating parts are to be balanced, find :

(a) The magnitude and the position of the balancing masses required at a radius of 0.6 m and
(b) The hammer blow per wheel when the axle makes 6 *rps*.

SECTION - IV

7 (a) Find the natural frequencies and normal mode (amplitude ratio's) for the system shown in Figure 3 considering,

$K_1 = k_2 = k_3 = k$ and $m_1 = m_2 = m$

(b) A steel shaft of diameter 25 mm and length 1 m is supported at the two ends in bearings. It carries a turbine disc, of mass 20 kg and eccentricity 0.005 m, at the middle and operates at 6,000 rpm. The damping in the system is equivalent to viscous damping with ζ=0.01. Determine the whirl amplitude of the disc at,

i. Operating speed,
ii. Critical speed, and
iii. 1.5 times the critical speed

8 (a) Determine the natural frequencies and normal modes of the torsional system shown in Figure 4 for $k_{t1} = k_t$, k_{t2}, $J_1 = J_0$ and $J_2 = 2_{J0}$

(b) A reciprocating *IC* engine is coupled to a centrifugal pump through a pair of gears. The shaft from the flywheel of the engine to the gear wheel has 48 mm diameter and is 800 mm long. The shaft from the pinion to the pump has 32 mm diameter and is 280 mm long. Pump speed is four times the engine speed. Mass moments of inertia of flywheel, gear wheel, pinion and pump impeller are 100 kgm^2, 14 kgm^2, 5 kgm^2 and 18 kgm^2 respectively. Determine the natural frequency of the torsional oscillation of the system ***ignoring the mass moment of inertia of gears***

SECTION - V

9 (a) The measurement on a mechanical vibrating system has a mass of 10 kg and spring equivalent stiffness 5 N/mm. If the vibrating system has a dashpot attached which exerts a force of 40 N when the mass have a unit velocity of 1 m/s. Determine the logarithmic decrement and ratio of two successive amplitudes.

(b) A machine part of mass 5 kg vibrates in a viscous medium. A harmonic exciting force of 50 N acts on the machine and causes resonance amplitude of 15 mm with a period of 0.2 sec. Determine the damping co-efficient. If the system is excited by a harmonic force of frequency 4 Hz, what will be the percentage increase in the amplitude of forced vibration when damper is removed?

10 (a) Write the expression for force transmissibility and explain the concept with the help of simple graph/figure

(b) Write a short note on multidegree-of-freedom system

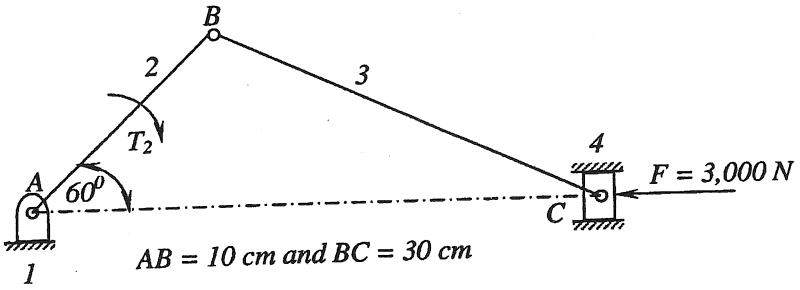


Fig. 1

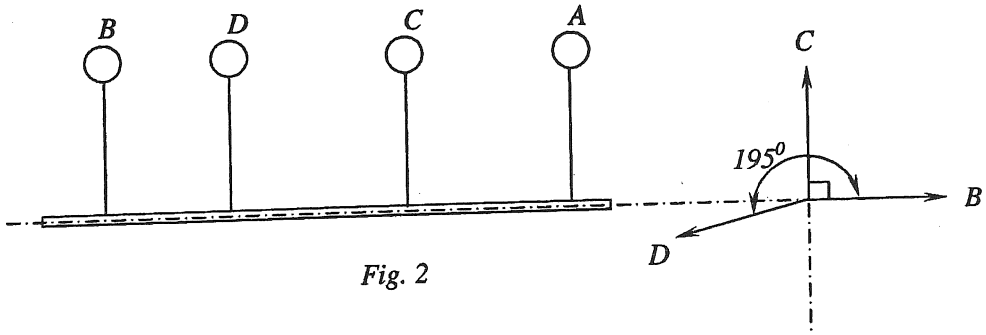


Fig. 2

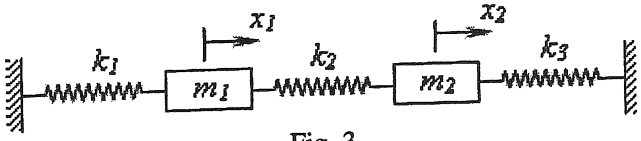


Fig. 3

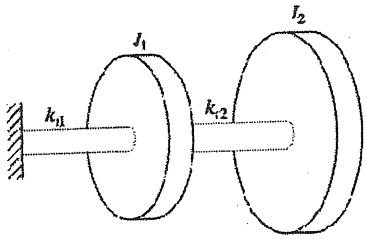


Fig. 4

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

MICRO CONTROLLERS AND EMBEDDED SYSTEMS
(Electronics & Communication Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 a) Discuss the register set of 8051 microcontroller?
b) Explain the instruction set of 8051 microcontroller?

2 a) Sketch the architecture of 8051 microcontroller and explain it?
b) Distinguish between Microprocessors and microcontrollers?

SECTION - II

3 a) Give brief overview and features of PIC microcontrollers?
b) Explain the register set of PIC microcontroller?

4 a) Discuss the memory organization of PIC microcontroller?
b) Discuss the addressing modes of PIC microcontroller with an examples?

SECTION - III

5 a) Define an embedded system. Give the differences between embedded and general computing system.
b) Explain how software is embedded into a system.

6 a) Explain the basic process and hardware units in the embedded system.
b) Explain the role of processor in embedded system and write different types of processor used in embedded systems.

SECTION - IV

7 a) What are the issues in designing embedded systems
b) Explain the software tools in designing of embedded system.

8 Write short notes on the following
a) Explain the issues of compilers and linkers.
b) Explain various debugging tools

SECTION - V

9 a) Write about semaphores with types in detail.
b) Explain briefly about mail box related functions

10 a) Define Interrupt latency? How can you reduce it?
b) What is meant by memory management in RTOS? Explain.

Code : 13CS4104

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

WEB TECHNOLOGY
(Computer Science & Engineering)

Time : 3 hours | Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION-I

1. Explain the classification of HTML tags with examples.
2. Define frame. Create a HTML page that displays multiple frames in a window.

SECTION-II

3. Define DTD. Explain various types of DTDs with examples.
4. What is web server? Explain Apache and WAMP servers.

SECTION-III

5. Explain about Http Servlet Request and Servlet Response interfaces.
6. Define JSP. Explain various elements in JSP

SECTION-IV

7. Draw and explain 2-tier and 3-tier architecture of client/server model.
8. Explain about building blocks arrangements.

SECTION-V

9. Explain with an example program how to connect to a SQL Server database from a PHP script.
10. Write a PHP code to validate the form consisting of a username, password and email fields.

Code: 13ME4105

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

TOOL DESIGN

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 a) Discuss the responsibilities of Tool Engineer.
b) Explain with neat sketch the nomenclature of single point cutting tool.
2 a) Different between the orthogonal cutting and oblique cutting.
b) Explain the chip thick relationship between cutting velocity and chip–flow velocity and shear velocity.

SECTION - II

3. a) A tool will cut for 4 hours before it needs sharpening. Determine the time charged to one cycle if it takes 12 minutes to change the tool and tool can be sharpened 10 times before it is discarded.
b) Explain the factors used for judging the machinability.
4 a) While machining a mild steel bar with H.S.S tool the cutting speed is 32m/min, tool life is 50 min, if cutting speed is increased by 50%, how tool life is affected .Take n= 0.2.
b) Explain the methods of measuring cutting force on a lathe machine tool.

SECTION - III

5 a) Explain the design features of HSS and Coated carbides.
b) What is carbide tipped tool? Discuss their applications.
6 a) Design of form tool for lathe work.
b) What are non-metallic tooling materials? Explain in detail.

SECTION - IV

7 a) What is a stripper plate? Describe various types of stripper plates.
b) What is a pilot? Sketch and describe various types of pilots.
8 a) Derive an expression for diameter of a smallest hole that can be punched.
b) Explain the Die block design.

SECTION - V

9 a) What is meant by a fixture? Describe following types of fixtures.
i) Milling fixtures ii) Grinding fixture
b) Describe various types of drilling jigs.
10 a) Explain about 3-2-1 principle of location with neat sketch.
b) Sketch and explain various two way clamps.

Code: 13SH4101

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech I Semester

ECONOMICS & ACCOUNTANCY

(Civil Engineering)

Time: 3 hours Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*

All Questions carry equal marks

* * *

SECTION - I

1 a Outline the importance of Elasticity of Demand.

b Define the concept of economics. Explain the consumer's equilibrium.

2 What do you mean by Demand? Explain Law of demand with suitable examples.

SECTION - II

3 a Explain the Law of Returns to Scale.

b What is BEA? Explain its advantages and disadvantages

4 Explain in detail Functions of Commercial Banks

SECTION - III

5 a Define price discrimination. Explain the Equilibrium of monopoly firm under discriminating monopoly.

6 a Explain the characteristic features of Monopolistic competition.

b Explain the conditions required for the success of Discriminating Monopoly.

SECTION - IV

7 a What do you mean by debenture? Explain the Types of Debentures.

b What is partnership? Mention the Advantages and disadvantages of a partnership.

8 a What do you mean by Company? Mention it features and explain the advantages and disadvantages of Company.

SECTION - V

9 a What is capital budgeting? Briefly explain Capital Budgeting Process.

b Define Accounting. Mention the Concepts and principles of accounting

10 From the following information you are required to prepare trading and Profit and Loss a/c and Balance Sheet of Mr Ramu & Co for the year ended 31st December 2016.

Particulars	Amount	Particulars	Amount
Drawings	4500	Rent	350
Purchaes	20000	Bad Debts	400
Returnd inwards	1500	Disount allowed	700
Stock	8000	sundry debtors	14000
Salaries	4200	Cash in hand	260
Wages	1200	Insurance	400
cash at bank	5940	Bills payable	2500
Trade expenses	300	Printing	150
Capital	24000	Disount Received	1900
Sundy Creditors	10000	Furniture	2000
Machinery	5000	Sales	30500

Adjustments:

1. Closing Stock Rs.7000
2. Insurance Prepaid Rs.60
3. Outstanding liabilities: Salaries Rs.200 and Wages Rs.200
4. Depreciate Machinery at 5 % and Furniture at 10%

Code :13EE4116

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

POWER SYSTEM ANALYSIS

(Electrical & Electronics Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
***

SECTION – I

1 (a) A three phase transmission line operating at 110kV and having impedance 5+j20Ω is connected to the generating station through 15000 kVA step-up transformer. Two alternators are connected to the bus bars. The ratings of the alternator are 10MVA, 10%, 16kV and 5MVA, 7.5%, 16kV. Calculate the short circuit MVA for a symmetrical fault at the load end of transmission line. Take transformer reactance as 8%.

(b) For the 3-bus network shown in Fig. 1 build Z_{bus}.

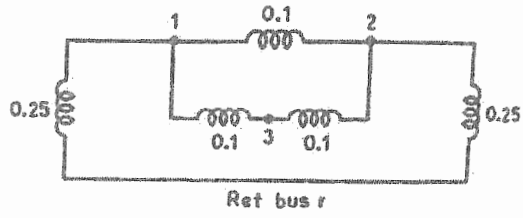


Fig. 1

2 (a) A 1250kVA, 5000V generator with $X_d'' = 0.08 p.u$ supplies a purely resistive load of 1000kW at rated voltage. The load is connected directly across the terminals of the generator. If all the three phases of the load are short circuited simultaneously find the symmetrical short circuit current in the generator.

(b) A synchronous generator and motor are rated for 30MVA, 13.2kV and both have sub transient reactance of 20%. The line connecting them has a reactance of 10% on the base of machine ratings. The motor is drawing 20MW at 0.8 pf leading. The terminal voltage of the motor is 12.8kV. When a symmetrical three-phase fault occurs at motor terminals, find the sub transient current in a generator, motor and at the fault point.

SECTION – II

3 (a) Determine the symmetrical components of three phase voltages
$V_a = 200\angle 0^0, V_b = 200\angle 245^0, V_c = 200\angle 105^0$

(b) A single-phase resistive load of 100 kVA is connected across lines *bc* of a balanced supply of 3 kV. Compute the symmetrical components of the line currents.

4 (a) Explain phase shift in star-delta transformers with phasor diagram.

(b) For the power system whose one line diagram is shown in Fig. 2, sketch the zero sequence network.

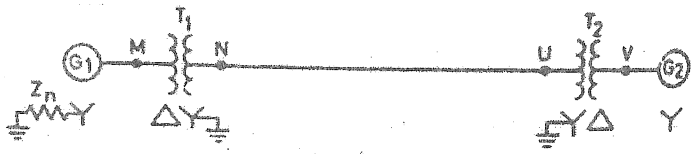


Fig. 2

SECTION – III

5 (a) Derive an expression for fault current for a Line-Line-Ground fault.

(b) The reactance of a generator rated 100 MVA, 20 kV, are $X_d'' = X_1 = X_2 = 20\%$ and $X_0 = 5\%$. The generator is connected to a $\Delta - Y$ transformer rated 100 MVA, 20kV/230kV, with a reactance of 10%. The neutral of the transformer is solidly grounded. The terminal voltage of the generator is 20 kV when a single line-ground fault occurs on the open-circuited high-voltage side of the transformer. Find the initial symmetrical rms current in all phases of the generator.

6 (a) Explain in detail about bus impedance matrix in fault calculations.

(b) Draw the connection of the sequence networks of shown in Fig. 3 for an LG fault at bus N.

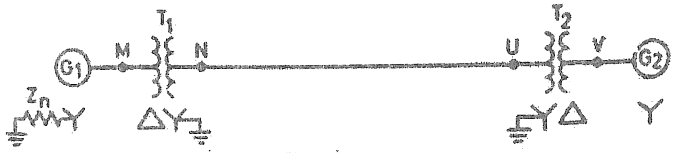
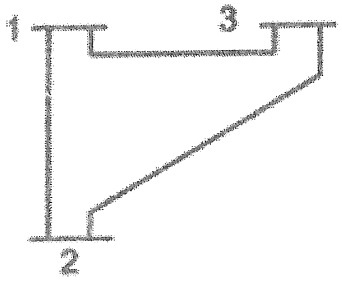


Fig. 3

SECTION – IV

7 (a) Compare the Gauss-Seidel, N-R and Decoupled load flow methods

(b) Find out the Y matrix of the sample power system as shown in Fig 4. Data for this system are given in Table 1



Bus code *i-k*	Impedance Z_{ik}	Line charging $y'_{ik/2}$
1-2	0.02 + *j*0.06	*j*0.03
1-3	0.08 + *j*0.24	*j*0.025
2-3	0.06 + *j*0.18	*j*0.020

Fig. 4

8 Fig. 5 shows the one-line diagram of a simple three-bus power system with generation at bus 1and 3. The magnitude of voltage at bus 1 is adjusted to1.05p.u. Voltage magnitude at bus 3 is fixed at 1.04 pu with real power generation of 200 MW. A load consisting of 400 MW and 250 Mvar is taken from bus 2. Line impedances are marked in per units on a 100 MVA

base, and the line charging susceptances are neglected. Obtain the power flow solution by the Gauss-Seidel method including line flows.

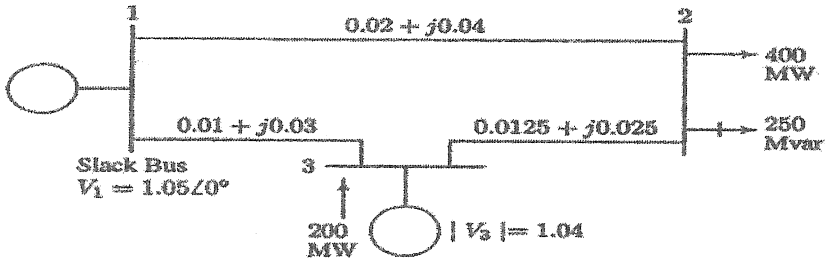


Fig. 5

SECTION – V

9 (a) Derive the swing equation used for stability studies in power system

(b) A 4-pole, 50Hz synchronous generator has a rating of 250 MVA, 0.8 pf lagging. The moment of inertia of the rotor is 45,100 kg-m^2. Determine M and H.

10 Consider a synchronous machine characterized by the following parameters: $X_d = 1.0pu,\ X_q = 0.6pu, X_d^{'} = 0.3pu$ and negligible armature resistance. The machine is connected directly to an infinite bus of voltage 1.0pu. the generator is delivering a real power of 0.5 pu at 0.8 pf lagging. Determine the voltage behind transient reactance and the transient power angle equation for the following cases.

(a) Neglecting the saliency effect

(b) Including the effect of saliency.

Code : 13CE4101

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

ENVIRONMENTAL ENGINEERING - II
(Civil Engineering)

Time: 3 hours Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks
* * *

SECTION - I

1 (a) Discuss the factors affecting both sanitary and storm sewages. Give an account of determination of storm Sewage.

(b) Find the diameter and discharge of a circular sewer laid at a slope of 1 in 600, when it is running half full with a velocity of 1.55 m/s (assume Mannings constant 0.012).

2 (a) Describe the Sewerage systems and their relative merits and de-merits. State the conditions under which they are suitable.

(b) What are the various systems of Plumbing? Explain their relative merits and de-merits with neat sketches.

SECTION - II

3 (a) Describe the role of BOD parameter in waste water engineering.

(b) 5 day BOD of a waste water sample at 20^0 C is 180 mg/1. Find its 3 day BOD at 15^0 C? BOD rate constant k = 0.23/day.

4 Draw a flow chart of typical Sewage Treatment Plant (STP) and briefly explain functions of various units of STP.

SECTION - III

5 (a) Write short notes on the following :
(i) Recirculation and its advantages in Tricking Filters
(ii) Sludge bulking

(b) Differentiate Standard rate Trickling filter and High rate Trickling filter.

6 (a) Differentiate Activated Sludge Process and Trickling Filter Process.

(b) What are the methods of aeration in activated sludge process? Describe Simplex process of aeration with neat sketch.

SECTION - IV

7 (a) What are the factors affecting Sludge digestion? Explain them.

(b) Explain the working of Sludge drying beds with a neat sketch.

8 (a) Write a note on sludge Thickening and conditioning.

(b) Explain the removal process of Nitrogen and Phosphorus.

SECTION – V

9 (a) Explain Self-Purification process with reference to Oxygen Sag curve.

(b) What is Sewage Sickness? What are the remedial measures?

10 (a) Explain different methods of sewage farming.

(b) Design a septic tank for 75 users for a sewage flow rate of 80 lpcd. Also check for minimum space requirement.

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

DIGITAL SIGNAL PROCESSING
(Common for EEE & ECE)

Time : 3 hours | Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks
* * *

SECTION - I

1 Obtain the causal sequence x(n) from the z-domain

(i) $X(z)=\dfrac{z(z+1)}{(z-1/2)(z-1/4)}$

(ii) $X(z)=\dfrac{z^2+z+1}{2z^3+3z^2+z+4}$ (iii) $X(z)=\dfrac{z(z-2)}{(z-1/4)^3}$

2 Apply Z-Transform on x(n) and obtain X(z). Draw the pole zero plot and indicate its ROC, $x(n)=6\delta(n)+3\left(\frac{1}{2}\right)^n u(n)-2\left(\frac{1}{3}\right)^n u(n)$

SECTION - II

3 Compute 4-point DFT of a sequence x(n)={1,2,3,4}? Hence convert X(k) into x(n) through IDFT

4 Evaluate the response of a LSI system having input x(n)={1,2,3,4} and impulse response h(n)={5,6,7,8,9} using (i)Linear convolution (b)Circular convolution

SECTION - III

5 Realize the discrete system having LCCDE $y(n)-1/2y(n-1)-1/3y(n-2)-1/4y(n-3)=2x(n)+3x(n-1)+4x(n-2)$ by using (i) DF-I (ii) DF-II

6 Compare direct form-I realization with direct form-II realization. Why DF-II is most widely used? Explain

SECTION - IV

7 Design a digital IIR low pass filter for the following specifications by using Chebyshev approximation and Bilinear transformation. Specifications of a filter are

$0.8 \le |H(jw)| \le 1.0; 0 \le w \le 0.2\pi,$

$|H(jw)| \le 0.2; 0.32\pi \le w \le \pi$

8 Construct a digital IIR filter from the transfer function of an analog filter $H(s) = \frac{s}{(s+1)(s+2)}$ by using (a) Impulse Invariant Transformation (b) Bilinear Transformation. Assume T=1.

SECTION - V

9 Design a digital FIR low pass filter with a cutoff frequency of 1.2 rad/sec by taking 9 samples of rectangular window.

10 Design a digital FIR Band pass filter to pass frequencies in the range 1 to 2 rad/sec by taking 9 samples of hamming window.

Code : 13ME4101

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech I Semester

PRODUCTION SYSTEMS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

Section-I

1 a) Define Production. Explain the systems concept of production with a block diagram.

b) Describe the elements, characteristics and benefits of JIT production system.

OR

2 Define the terms 'lean manufacturing' and 'agile manufacturing'. Explain the principles of both and also compare.

Section-II

3 a) Explain the characteristics of single facility rectilinear mini-max location model.

b) In a foundry, there are seven shops whose coordinates are as given below. The company is interested in locating a new costly fire-fighting equipment in the foundry. Determine the mini-max location for the new equipment.

Shop No.	1	2	3	4	5	6	7
Coordinates	(10,20)	(30,40)	(10,120)	(10,60)	(30,100)	(30,140)	(20,190)

4 a) What is a Travel chart? Explain the procedure of constructing the travel chart and state its advantages.

b) What is REL chart? Explain its construction and significance.

Section-III

5 Construct the precedence diagram for the following data. Calculate the number of workstations and compute the balance delay if the cycle time is 1 minute. (Use RPW Method).

Task	1	2	3	4	5	6	7	8	9	10
Time(min)	0.5	0.3	0.8	0.2	0.1	0.6	0.4	0.5	0.3	0.6
Preceding task	-	1	1	2	2	3	4,5	3,5	7,8	6,9

6 Explain the objectives, inputs, outputs, benefits and drawbacks of Material Requirements Planning system.

Section-IV

7 a) Define and discuss in detail various methods of aggregate planning.

b) Write a note on manufacturing and service strategies.

8 A company manufacturing an item is in need of an aggregate plan for July through December. The company has gathered the following data:

Period	July	Aug	Sep	Oct	Nov	Dec
Demand	400	500	550	700	800	700

Holding cost = Rs.8/item/month, Sub-contracting cost = Rs.80/item, Regular time production cost = Rs.10/hour, Over time cost = Rs.16/hr, hiring cost = Rs.40/worker, layoff cost = Rs.80/worker, current workforce = 8, labor hours/item = 4 hrs, working days per month = 20, beginning inventory = 150 items. Vary the work force so that exact production meets forecast demand. Begin with 8 workers on board at the end of June. Calculate the cost of this plan.

Section-V

9 For the following data draw networks and determine the Critical Path. Also compute Total float, free float and independent float for non-critical activities.

Task	A	B	C	D	E	F	G
Duration	10	7	5	3	2	1	14
Precedence	-	-	A	C	D	B,E	E,F

10 Using the following data, crash the project, if indirect cost is Rs.50/week.

Activity	1-2	2-3	2-4	2-5	3-5	4-5	5-6	6-7	6-8	7-8
Normal Time	3	3	7	9	5	0	6	4	13	10
Normal Cost	300	30	420	720	250	0	320	400	780	1000
Crash Time	2	3	5	7	4	0	4	3	10	9
Crash Cost	400	30	580	810	300	0	410	470	900	1200

Code : 13CS4101

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

DATA WAREHOUSING AND DATA MINING
(Computer Science & Engineering)

Time : 3 hours | Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

1 (a) What is Data warehouse? Explain the Data Warehouse Development life cycle.

(b) Discuss in detail about Data Warehouse Architecture.

2 (a) Explain the framework of the Data Warehouse design.

(b) Write short notes on Data Warehouse Development Methodologies.

SECTION - II

3 Explain ETL process in Data Warehouse Architecture.

4 (a) Write short notes on Dimensional Model and Additives of Facts.

(b) Explain rapidly changing Dimensions and Multi – use Dimensions in Data Warehouse.

SECTION - III

5 (a) Explain the Major issues in Data Mining

(b) Briefly describe the primitives for specifying Data Mining task.

6 (a) Explain the Architecture of Data Mining system?

(b) Explain different Data Mining Functionalities.

SECTION - IV

7 Explain attribute – Oriented induction for Data Characterization.

8 What is meant by Frequent item set? Write the algorithm for frequent item set generation with candidate? Explain with an example.

SECTION - V

9 (a) What is decision tree? Explain how does it work for classification problem?

(b) Discuss the Native Bayesian Classification.

10 (a) What is partitioning method? Describe any one partition based clustering algorithm.

(b) Discuss the Density – Based Local Outlier Detection.

Code : 13CE41E1

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech I Semester

PRE-STRESSED CONCRETE STRUCTURES
(Civil Engineering)

Time : 3 hours Max Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All questions carry equal marks

SECTION-I

1 (a) Explain about advantages of pre-stressed concrete.

(b) A pre stressed concrete beam of section 120 mm wide and 300 deep is used over an effective span of 6 m to support a uniformly distributed load of 4 kN/m (inclusive of self-weight of the beam). The beam is pre-stressed by a straight cable carrying a force of 180 kN and located at an eccentricity of 50mm. Determine the location of the thrust-line in the beam and resulting stresses in the beam at quarter and central span sections. Plot the position of thrust line also.

2. A concrete beam of symmetrical I-section spanning 8m has the width and thickness of flanges equal to 200mm and 600mm respectively. The overall depth of the beam is 400mm. The thickness of the web is 80mm. The beam is pre-stressed by a parabolic cable with an eccentricity of 150mm at the centre and zero at the supports with an effective force of 100 kN. The live load on the beam is 2 kN/m. Draw the stress distribution diagram at the central section for

(a) Prestress + self weight
(b) Prestress + self weight + live load

SECTION-II

3 A pre-tensioned beam 250mm wide and 300mm deep is pre-stressed by 12 wires each of 7mm diameter initially stressed to 1200 N/mm^2 with their centroids located 100mm from the soffit. Estimate the final percentage loss of stress due to elastic deformation, creep, shrinkage and relaxation using IS: 1343-1980 and the following data:
Relaxation of steel stress = 90 N/mm^2
$E_s = 210$ kN/mm^2 $E_c = 35$ kN/mm^2
Creep coefficient (Ø) = 1.6
Residual shrinkage strain = 3×10^{-4}

4 A Pre-tensioned beam 80mm wide and 120mm deep is to be designed to support working loads of 4 kN each concentrated at the third points over a span of 3m. If the permissible stresses in tension are zero at transfer and 1.4 N/mm^2 under working loads, design the number of 3mm wires and the corresponding eccentricity required at the mid span section. Permissible tensile stress in wires is 1400 N/mm^2. The loss of prestress is 20%.

SECTION-III

5 Design a post-tensioned concrete bean to support a uniformly distributed load of 12 kN/m and live load of 16 kN/m over a simply supported span of 15m. Use M40 concrete and HTS with ultimate tensile strength of 1800 MPa. Design the section. Also, Check the section for safety.

6 A PSC beam of 8m span of rectangular section, 130mm wide and 320mm deep is axially pre-stressed by a cable carrying an effective force of 190 kN. The beam supports a total uniformly distributed load of 6 kN/m, which include the self weight of the member. Compare the magnitude of the principal tension developed in the beam with and without the axial prestress.

SECTION-IV

7 A rectangular pre-tensioned concrete beam has a breadth of 100mm and depth of 230mm and the prestress after all losses have occurred is 12 N/mm^2 at the soffit and zero at the top. The beam is incorporated in a composite T-beam by casting a top flange of breadth 300mm and depth 50mm. Calculate the maximum uniformly distributed live load that can be supported on a simply supported span of 4.5 m, without any tensile stresses occurring,

(a) If the slab is externally supported while casting, and
(b) If the pre-tensioned beam supports the weight of the slab while casting.

8 Design the required depth of a composite deck slab of a bridge using the standard inverted T-beam M_1 of C and C.A. to support an imposed load of 15 kN/m^2 on an effective span of 15m. Determine the minimum prestressing force required and the corresponding eccentricity. Assume Grade 40 concrete in the precast beam with a compressive strength at transfer of 35 N/mm^2. The compressive strength of concrete in the in-situ-cast slab is 30 N/mm2. f_{ct} = 17.5 N/mm^2, f_{tw} = -2.9 N/mm^2.

SECTION-V

9 Design a post-tensioned pre-stressed concrete two-way slab, 6 m by 9 m with discontinuous edges to support an imposed load of 3 kN/m^2. Cables of four wires of 5mm diameter carrying an effective force of 100 kN are available for use. Design the spacing of cables in the two directions and check for the safety of the slab against collapse and excessive deflection at service loads. Assume f_{cu} = 40.0 N/mm^2, f_{pu} = 1600 N/mm^2 Ec = 38 kN/mm^2.

10 The deck slab of a road bridge of span 10 m is to be designed as a one-way pre-stressed concrete slab with parallel post-tensioned cables in each of which the force at transfer is 500 kN. If the deck slab is required to support a uniformly distributed live load of 25 kN/m^2 with the compressive and tensile stress in concrete at any stage not exceeding 15 and zero N/mm^2 respectively. Calculate the maximum horizontal spacing of the cables and their positions at the mid span section. Assume the loss ratio as 0.80.

Code No.13EE41E2

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

ELECTRICAL DISTRIBUTION SYSTEMS

(Electrical & Electronics Engineering)

Time : 3 hours Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION – I

1. (a) Explain the need for distribution automation and write the relationship between loss factor and load factor.

   (b) Explain the various classifications of loads with their characteristics in detailed

2. (a) Define and explain load factor, coincidence factor, contribution factor and loss factor.

   (b) Explain load modeling of distribution system and also write role of computer in distribution system.

SECTION – II

3. (a) Explain design consideration of distribution feeder of given below
   (i) Radial type primary feeder (ii) Loop type primary feeder

   (b) List the operational aspects that affects the primary feeder loading.

4. (a) How do you analyze a substation service area with 'n' primary feeders?

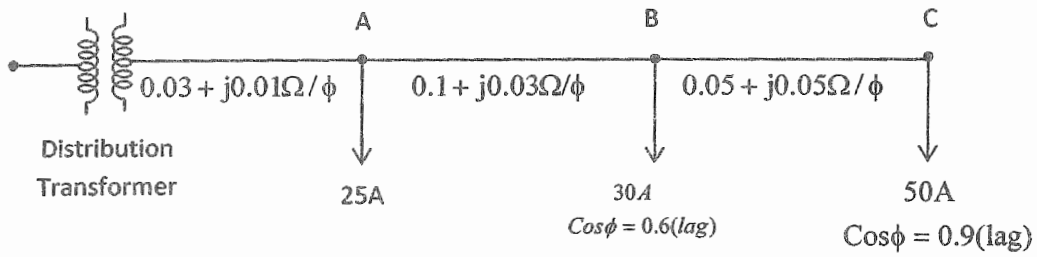
   (b) Explain the basic design practice of secondary distribution system.

SECTION – III

5. (a) Derive the approximate voltage drop and power loss equation of primary feeder of a uniformly distributed load.

   (b) A synchronous motor improves the power factor of a load of 250 kW from 0.8 lagging to 0.9 lagging. Simultaneously the motor carries a load of 100 kW. Determine (i) The leading kVAR taken by the motor. (ii) kVA rating of the motor. (iii) Power factor at which the motor operates.

6. Consider the three phase, three wire 250V secondary system with balanced loads at A, B and C as shown in figure. Determine (i) the total voltage drop in one phase of lateral (ii) the real power per phase for each load (iii) the reactive power per phase for each load and iv) the KVA output and load p.f. of the distribution transformer.



SECTION – IV

7. (a) What are the Objectives of distribution system protection and what is the data required for the selecting a protecting device.

   (b) Briefly discuss different types of faults in electrical distribution system.\

8. (a) Explain Principle of operation of Fuse and circuit breaker.

   (b) Explain general co ordination procedure for protective devices.

SECTION – V

9. (a) Explain the effect of Fixed and switched capacitor banks.

   (b) b. Explain about compensation of distribution system through shunt capacitors.

10. (a) Write the procedure to determine best capacitor location.

    (b) A synchronous motor having a power consumption of 50 KW is connected with a load of 150KW, a lagging p.f of 0.8. If the combined load has a power factor of 0.9, what is the leading reactive KVA supplied by the motor and at what p.f is it working.

Code : 13EC41E2

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

COMPUTER NETWORKS
(Electronics & Communication Engineering)

Time : 3 hours Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 Explain RS232C interface in detail with the help of a diagram.

2 Distinguish between circuit switched networks and virtual circuit networks.

SECTION - II

3 (a) Discuss the error detection and correction functionality of the data link layer.

(b) Draw the HDLC frame format and explain the fields in detail.

4 (a) What is pure ALOHA and slotted ALOHA?

(b) Explain CSMA protocol.

SECTION - III

5 Briefly explain the transport protocol X.25.

6 With an example explain the Dynamic routing algorithms used in computer networks.

SECTION - IV

7 Discuss about Data compression techniques.

8 What is cryptography? Explain RSA algorithm briefly.

SECTION - V

9 Write short notes on

(a) WWW (b) Web browsers (c) Web servers (d) URL

10. Discuss in detail about new features of HTML.

Code : 13ME41E4

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017
IV B.Tech I Semester
REFRIGERATION & AIR CONDITIONING
(Mechanical Engineering)

Time : 3 hours Max Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All questions carry equal marks

SECTION-I

1 (a) Derive an expression for the C.O.P of a Bell-Coleman cycle refrigeration system.

(b) Define COP and Ton of refrigeration.

2 (a) Explain the principle parts of simple vapour compression refrigeration system?

(b) In an ammonia vapour compression system. The pressure in the evaporator in 2bar. Ammonia at exist is 0.85 dry and at entry its dryness fraction is 0.19. During compression the work done per kg of ammonia is 150 kJ. Calculate the C.O.P and the volume of vapour entering the compressor minute, if the rate of ammonia circulation is 4.5 kg/min. Tha latent heat and specific volume at 2 bar are 1325kJ/kg and 0.58 m^3/kg respectively

SECTION-II

3 (a) What is the volumetric efficiency of the compressor and find the expression for volumetric efficiency.

(b) List the advantages and disadvantages of air-cooled condensers over water cooled condensers.

4 (a) Discuss what factors are considered in designing cooling tower.

(b) Explain the working of the following types of evaporators with neat sketches.

i) Flooded evaporator
ii) Shell and tube evaporator

SECTION-III

5 (a) Explain the working of an automatic expansion valve with the help of a neat sketch.

(b) With the help of neat diagram, explain the working principle high side float valve.

6 (a) Define food preservation. What are its advantages? Explain how the Refrigeration controls the spoilage of food.

(b) Describe any two basic methods of freezing food products.

SECTION-IV

7 (a) Explain the following terms
i) Density of Humid air ii) Specific volume of humid air

(b) In a heating application, moist air enters a steam heating coil at 10^0c. 50%RH and leaves at 30^0C. Determine the sensible heat transfer if mass flow rate of air is 100kg of dry air per second. Also determine the steam mass flow rate of steam enters saturated at 100^0c and condensate leaves at 80^0c.

8 (a) Define sol-air temperature and equivalent temperature difference.

(b) A restaurant with a capacity of 100 persons is to be air-conditioned with the following conditions: Outside conditions- 30^0C DBT and 70%RH; Desired inside conditions: 23^0C DBT and 55%RH; Quantity of air supplied : $0.5m^3$ / min / person . The desired conditions are achieved by cooling, dehumidifying and then heating. Determine i) capacity of cooling coil in tones of refrigeration ii) Capacity of heating coil iii) Amount of water removed by dehumidifier and iv) By-pass factor of the heating coil if its surface temperature is 35^0C.

SECTION-V

9 (a) What is Effective temperature? What factors affect effective temperature?

(b) Explain the differences between winter air conditioning and summer air conditioning.

10 (a) Derive an expression for the equivalent diameter of circular duct corresponding to a rectangular duct of sides a and b. for the same pressure loss per unit length when the velocity of the air flowing through both the ducts is same.

(b) Define the following
i) Fan total pressure ii) Fan air power iii) Fan total efficiency.

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

SOFTWARE ARCHITECTURE

(Computer Science & Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 Enumerate and explain in detail, the different groups of software architecture structures are categorized into, with the help of appropriate pictorial description.

2 (a) What are the features of Good Software Architecture?

(b) Explain in detail the building of Architecture Business Cycle.

SECTION - II

3 (a) Discuss the importance and advantages of the architectural styles with reference to an appropriate application area.

(b) Discuss the invariants, advantages and disadvantages of pipes and filters architectural style.

4 Explain Shared information styles in detail with neat diagram.

SECTION - III

5 (a) What are the advantages of user interface architectures? With the example illustrate about user interface architecture.

(b) What is SOA and web Services?

6 List various architectural styles. What are the differences between architectural styles and architectural patterns? Write the overall structure of a pattern? Explain the categories of patterns.

SECTION - IV

7 (a) Explain about Architectural Design Space.

(b) Explain in detail, the broker architectural pattern to structure distributed software system.

8 List the properties that ADL should exhibit. Point out the advantages and disadvantages of ADL. How ADL captures architectural information?

SECTION - V

9 (a) Explain about component based system.

(b) Write short notes of Reusing architectural assets.

10 (a) Explain Legacy System.

(b) How to achieving system architecture from architecture to system?

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

QUANTITY SURVEYING & VALUATION
(Civil Engineering)

Time: 3 hours | Max. Marks: 60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1. Estimate the following items for the plan and section given in Fig.1
   (i) Earthwork for excavation (ii) Plain cement concrete for foundation
   (iii) I Class brickwork for foundation (iv) Concrete for roof slab (thickness of slab = 100 mm)

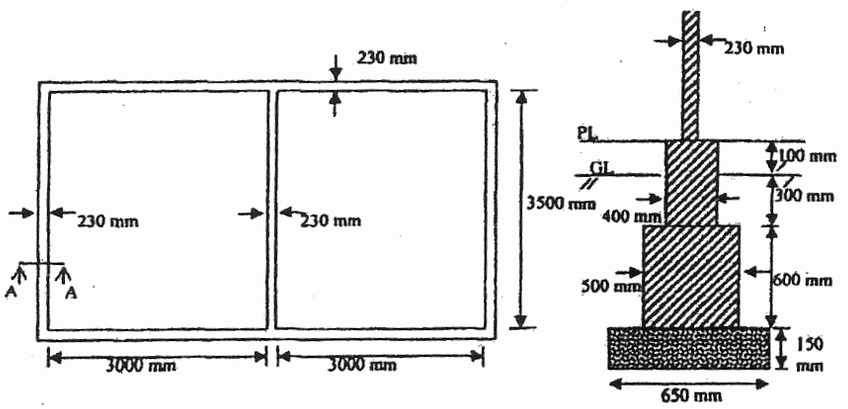


Fig. 1

2. Estimate the following items for the Fig.2 shown below :
   (i) Earthwork Excavation (ii) Cement concrete in foundation
   (iii) Brickwork (iv) 25mm CC (1:5:3) in surface finish

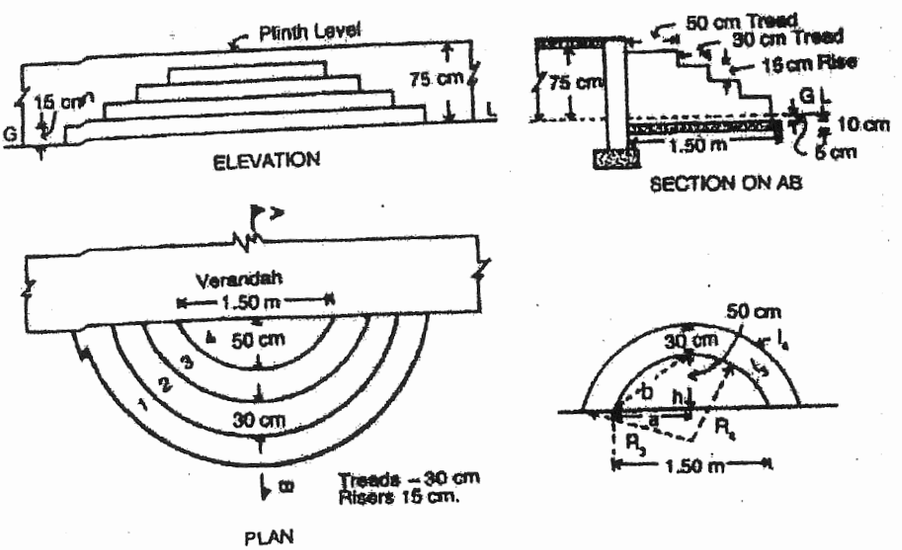


Fig. 2

SECTION - II

3. (a) What is the importance of specifications?

   (b) Explain the standard specifications for Brick masonry, Stone masonry and Mosaic flooring.

4. Write down the detailed specifications for
   (a) R.C.C. Roof and G.I Sheet roof (b) Plastering
   (c) Concrete in foundation (d) Wood work

SECTION - III

5. Explain the factors affecting the cost of a project. Discuss schedule of rates.

6. Prepare rate analysis for the following :
   (a) Lime concrete in foundation with brick ballast (40mm) for cubic-m
   (b) White washing one coat

SECTION - IV

7. Explain in detail the various legal aspects of construction contractors.

8. Draft a model tender notice for any typical construction work in a government department. The notice should contain all relevant details.

SECTION - V

9. (a) List the various method of valuation of property and explain any one method in detail.

   (b) Explain any on method of calculating depreciation of property with examples.

10. (a) Explain the following in terms:
   (i) Scrap value (ii) Salvage value
   (iii) Capitalized value (iv) Sinking fund

   (b) The total cost of RCC building is Rs.16,00,000.00, Workout the depreciated cost of the building after 30 years by straight line method if the scrap value is Rs.1,75,000.00. Assuming the life span of the RCC building is 50 years.

Code : 13EE4115

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

SWITCHGEAR AND PROTECTION
(Electrical & Electronics Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

1 What protective measures are taken against lightning over voltages?

2 Define insulation coordination. Describe the construction of volt-time curve and the terminology associated with impulse testing.

SECTION - II

3 a What are the desirable characteristics of a fuse element? Why do you prefer silver as a fuse element?

b Explain the points to be considered while selecting a fuse.

4 a What is resistance switching? Derive the expression for critical resistance in terms of system inductance and capacitance, which gives no transient oscillation.

b For a 132 kV system, the reactance and capacitance up to the location of the circuit breaker is 3 Ω and 0.015μf, respectively. Calculate the following (i) the frequency of transient oscillation. (ii) the maximum value of restriking voltage across the contacts of the circuit breaker (iii) the maximum value of RRRV.

SECTION – III

5 a Describe with the aid of neat sketch the working of an air blast circuit breaker.

b What is protective relay? Give its fundamental requirements.

6 Enumerate various types of ratings of a circuit breaker. Discuss symmetrical and asymmetrical breaking capacity, making capacity and short time current rating.

(P.T.O)

SECTION – IV

7 a Discuss the operating principle an induction disc relay.

b Show that the maximum torque occurs on the disc of an induction disc relay when the phase difference between the two fluxes is 90^0.

8 Compare the time current characteristics of inverse, very inverse and extremely inverse overcurrent relays. Discuss their area of applications.

SECTION – V

9 Explain with a neat diagram the application of merz-price circulating current principle for the protection of alternator.

10 a What are the requirements of protection of lines?

b Describe the following systems of bus-bar protection (a) Differential protection (b) Fault bus protection.

Code : 13EC4103

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

VLSI DESIGN

(Electronics & Communication Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

1 a) Explain the gate source formation and isolation steps of CMOS fabrication process with necessary diagrams.
b) What is the effect of threshold voltage on MOSFET current ? Explain through necessary equations.

2 a) Explain each of the alternate forms of pull up?
b) Calculate on resistance of the circuit from VDD to GND. If n- channel sheet resistance $R_{sn}=10^4$ per square and P-channel sheet resistance $R_{sp} = 3.5 \times 10^4$ per square.

SECTION – II

3 a) Describe three sources of wiring capacitances and Explain the effect of wiring capacitances on the performance of a VLSI circuit.
b) For a CMOS inverter calculate the shift in transfer characteristic curve when $\beta n/ \beta p$ ratio is varied from 1/1 to 10/1.

4 a) What are the affects of scaling on threshold voltage?
b) What are design rules? Why is metal- metal spacing larger than poly –poly spacing.
c) What are the differences between α and β scaling factors? Give some examples

SECTION – III

5 a) Explain the issues associated with pass transistor logic with suitable example.
b) Write briefly on different placement techniques.
c) Explain clocking schemes adapted in digital systems.

6 a) With the help of appropriate circuit diagram and waveforms explain the charge sharing problem of dynamic logic. How to overcome the same.
b) What are the different types of Routing techniques? Explain in detail.

SECTION – IV

7 a) Draw the circuit diagram for 4X4 barrel sifter using complementary transmission gates and explain its shifting operation.
b) Explain the Booth decode cell used for Booth multiplier.
c) Compare the Antifuse and Via link programmable interconnections for PAL devices.

8 a) Explain the memory cell read and write operation of 6T SRAM with neat Sketches.
b) What are different typically available SSI Standard-cell types and compare them.
c) Write about the features of Xilinx XC 4000 FPGA.

SECTION – V

9 a) Write VHDL code for a 4 bit shift register.
b) Explain the continuous and implicit continuous assignment with suitable examples for each.
c) What is post layout timing simulation?

10 a) What are the test fixtures required to test a chip?
b) What is ATPG? Explain a method of generation of test vector
c) Describe the principle and applications of built in self-test.

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Code : 13ME4103

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech I Semester

DESIGN OF MACHINE ELEMENTS

(Mechanical Engineering)

Time : 3 hours Max Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

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SECTION - I

1 (a) How are the keys classified? Draw neat sketches of different types of keys and state their applications.

(b) Determine the axial force required to effect the relative movement between the shaft and the connected part to transmit a torque of 60 N-m, if a coefficient of friction between the keys and key ways is 0.08.

2 (a) Describe with the help of neat sketches, various types of shaft couplings with their uses.

(b) Design a clamp coupling to transmit 30 kw at 100 r.p.m. The allowable shear stress for the shaft and key is 40 MPa and the number of bolts connecting the two halves are six. The permissible tensile stress for the bolts is 70 MPa. The coefficient of friction between the muff and the shaft surface may be taken as 0.3.

SECTION – II

3 (a) State the hydrodynamic action in the journal bearings with neat sketches.

(b) Following data is given for 3600 hydrodynamic bearings: Journal diameter =100 mm, Radial clearance =0.12mm, Radial load =50kN, Bearing length =100 mm, Journal speed =1440rpm and Viscosity of lubricant = 16CP. Calculate

(i) Minimum film thickness (ii) Coefficient of friction and (iii) Power lost in friction.

4 (a) Mention the importance and applications of self-aligning ball bearings.

(b) The ball bearing for the drilling machine spindle is rotating at 3000rpm. It is subjected to radial load of 2500N and an axial load of 1500N. It is to work 50 hours per week for one year. Design a suitable bearing if the diameter of the spindle is 40mm.

SECTION – III

5 (a) State the importance of the following (i) Spring Index in coil spring. (ii) Nipping in leaf spring

(b) Design a close coiled helical compression spring for a service load ranging from 2250 N to 2750 N. The axial deflection of the spring for the load range is 6 mm. Assume a spring index of 5. The permissible shear stress intensity is 420 MPa and modulus of rigidity, G = 84 kN/mm^2.

6 A semi-elliptical laminated vehicle spring to carry a load of 6000 N is to consist of seven leaves 65 mm wide, two of the leaves extending the full length of the spring. The spring is to be 1.1 m in length and attached to the axle by two U-bolts 80 mm apart. The bolts hold the central portion of the spring so rigidly that they may be considered equivalent to a band having a width equal to the distance between the bolts. Assume a design stress for spring material as 350 MPa. Determine:
1. Thickness of leaves, 2. Deflection of spring, 3. Diameter of eye
4. Length of leaves, and 5. Radius to which leaves should be initially bent.

SECTION – IV

7 (a) Why do you need nonmetallic gears?
(b) A pair of helical gears in a milling machine is used to transmit 4.5 kW at 1000 rpm of the pinion and the velocity ratio is 3:1. The helix angle of the gear is 15^0 and both gears are made of steel C45. The gears are 20^0 FDI and the pinion is to have minimum of 20 teeth. The gear is to work 8 hrs/day for 3 years. Design the helical gears. Take the required hardness for both gears is more than 350 BHN.

8 (a) When do you prefer spur gears than helical gears?
(b) A pair of straight spur gears is required to reduce the speed of shaft from 500 to 100 rpm while continuously running 12hr per day. The pinion is of 40C8 steel and has 20 teeth. The wheel is of cast iron of grade FG200 and has 100 teeth. The gears are of 8mm module, 100 mm face width and 20^0 pressure angle. Calculate power rating.

SECTION – V

9 (a) Why the piston pin is located at or above the middle of the skirt length?
(b) Design a cast iron piston for a single acting four stroke engine for the following data:
Cylinder bore = 100 mm ; Stroke = 125 mm ; Maximum gas pressure = 5 N/mm^2;
Indicated mean effective pressure = 0.75 N/mm ; Mechanical efficiency = 80% ;
Fuel consumption = 0.15 kg per brake power per hour ; Speed = 2000 rpm
Higher C.V of fuel = 42×10^3 kJ/kg ; Tensile stress for cast iron (σ_t) = 38 MPa.
Any other data required for the design may be assumed.

10 (a) Torsional vibrations are dangerous for automobile components. Justify
(b) Design a I-section of a connecting rod for an I.C engine using the following data:
Piston diameter = 125 mm ; Stroke = 150 mm ; Length of connecting rod = 300 mm
Gas pressure = 5 N/mm^2; Speed of engine = 1200 rpm ; Factor of safety = 5 and material is steel 35 NiCr60. Assume any other data required for the design

Code : 13CS4103

B.TECH. DEGREE EXAMINATION, NOVEMBER 2017

IV B.Tech. I Semester

C# AND. NET FRAME WORK
(Computer Science & Engineering)

Time : 3 hours Max. Marks :60

*Answer **FIVE** Questions, Choosing **ONE** Question from each section*
All Questions carry equal marks

* * *

SECTION - I

1 (a) How does C# differ from Java? List the languages supported by .NET frame work.

(b) What is the importance of Main method in a C # program ? What is boxing ? why do we do it ?

2 (a) What are bitwise operators in C # ? Explain with suitable example. Write about special operators supported by C#.

(b) What is "fallthrough" in switch statement? How is it achieved in C# ? Write about enumerators in C# by implementing enum type.

SECTION - II

3 (a) What is constructor? Why do we usually declare constructors as public? What is this reference ?

(b) Discuss four types of accessibility modifiers which can be applied to classes and members to specify their level of visibility.

4 (a) Define an Interface. Explain about explicit interface implementation.

(b) Write short notes on overloading unary operators and overloading binary operators with suitable examples.

SECTION - III

5 (a) Create a Windows Form Application, with populating the Tree View Controls.

(b) Explain how to implement Copy Button Event.

6 (a) Illustrate with suitable example, how to add records, change an existing record or delete a record in ADO.NET.

(b) Explain how can you say that ADO. NET support XML.

SECTION - IV

7 (a) List the cycle of page handling by ASP. NET server.

(b) Explain about Responding to Postback Events.

8 (a) What is SOAP, WSDL and Discovery ?

(b) Discuss a technique to implement a web service in C# using the service classes of NET. Framework.

SECTION - V

9 (a) Summarize multi – module assemblies. Build with a suitable example.

(b) What is remoting ? Discuss different types of server objects in .NET.

10 What are threads? Discuss.

(a) Starting Threads

(b) Joining Threads

(c) Suspending Threads

(d) Killing Threads