

B.E. (Information Technology)
INTERNET OF THINGS (IOT)
(2015 Pattern) (414464(A)) (Elective-III) (Semester - II)

1. With neat diagram explain MIPV6 in detail.
2. Draw diagram and write algorithm and Python code to control LED using Raspberry Pi.
3. What are Amazon services for IOT? Explain the concept of Amazon auto scaling. List advantages and functions of Amazon EC2.
4. Define IOT. Explain any one application of IOT.
5. Write a short note on IEEE 802.15.4 access technology.
6. Draw and explain Raspberry Pi block diagram and its components.
7. Explain publish - subscribe model in detail.
8. What is cloud storage? Briefly discuss advantages of cloud storage.
9. How do data collection and analysis approaches differ in M2M and IOT.
10. Describe IPV6 packet format & compare IPV4 & IPV6 headers.
11. What is Django? Explain Django architecture and template system.
12. Explain IOT architecture with neat diagram.
13. Write in detail about classifications of sensors and actuators.
14. What is Raspberry Pi? Explain about its versions and various interfaces in detail.
15. List and explain IOT functional stack along with its sub-layers.

B.E (I.T)
MULTIMEDIA TECHNIQUES
(2015 Course) (414464(C)) (Elective - III)

1. Explain any four principles of animation with suitable examples.
2. What is difference between illumination and shading? What are types of illumination?
3. What is meant by buffer management? How it can be beneficial for media transmission?
4. What are the specification parameters of a digital image?
5. What do you mean by non-linearity in multimedia presentation?
6. What is meant by keyframe and tweening? What are its roles in animation?
7. Distinguish between author and audience and image and graphics, video and animation, production and playback
8. What is ray-tracing? Explain direct and indirect illumination with suitable diagram.
9. Differentiate between lossy and lossless compression types.
10. What is GStreamer? Why to use GStreamer?
11. What are the types of communication network which provides multimedia communication services?
12. Explain MPEG-4 encoder with suitable diagram.
13. Prove that "Whitted algorithm is recursive".
14. Explain Resource ReSerVation Protocol (RSVP) in multimedia
15. What is GLUT? Which are routines provided for various functions?

B.E. (Information Technology)
PARALLEL COMPUTING
(2015 Pattern) (Semester - II) (End Sem.) (Elective - IV)

1. Explain working of CUDA programming Model?
2. What are different techniques for parallelizing programs?
3. Differentiate between a multi-processor system and multi core system?
4. Discuss different kinds of data dependencies.
5. Explain any one application of GPU Computing
6. Explain shared memory Model.
7. Explain how the snooping is used to maintain cache coherence on centralized multiprocessors?
8. Discuss four OpenMP directives with their constructs.
9. Explain dependency analysis.
10. Explain non blocking communication in MPI.
11. Explain MPI features in detail?
12. Explain GPU Architecture with neat diagram?
13. Write short note on “CUDA Threads and Memories”
14. Discuss various MPI collective operations?
15. Define speedup and efficiency?

B.E. (Information Technology)
RURAL TECHNOLOGIES AND COMMUNITY DEVELOPMENT
(2015 Course) (Semester - II) (Elective-IV) (414465A)

1. What is head count index and poverty gap index?
2. With the help of an example explain the difference between growth and development.
3. How do we measure the quality of water?
4. Explain the significance of rural entrepreneurship.
5. What is watershed management?
6. What is the role of ICT in rural development and agriculture?
7. What is the role of non-agricultural sub-sector in rural development?
8. What are the various ways in which the knowledge base of community development can be enhanced?
9. Explain key characteristics of community development?
10. For rural entrepreneurship what financial resources are available?
11. What are the environmental considerations to be taken care of when creating energy?
12. Write a note on international community development?
13. What is the need of rural development?
14. Explain briefly the various forms of rural entrepreneurship.
15. What is the role of women self-help group in development?

B. E. (I. T.)
SOFT COMPUTING
(2015 Pattern) (Semester - I) (End Sem)
(Elective -II) (414457B)

1. With neat flowcharts explain the operation of a simple Genetic Algorithms.
2. Explain in brief evolutionary computing approach of soft computing.
3. What is Defuzzification? compare fuzzification and Defuzzification approaches with suitable example.
4. Write short Notes on Neuro fuzzy hybrid systems
5. Write short Notes on Fuzzy Tolerance Relation
6. Explain Basic components of Biological neurons.
7. Write short Notes on Multi - layer feed forward Network.
8. Write short Notes on Boltzmann Machines
9. Write short Notes on Genetic programming
10. Explain the concept of fuzzy ART Map with suitable diagram and eg.
11. Explain the working of fuzzy inference system with suitable diagram.
12. Explain any four application areas of soft computing.
13. Explain in brief feed forward and recurrent neural networks with suitable diagram.
14. Explain working of Bayesian Neural Networks with suitable diagram.
15. Explain concept of conventional optimization Algorithms what are their limitations?
16. Explain the concept of Ant colony optimization with suitable diagram.
17. Enlist and Explain in brief types of Genetic-Algorithms.

B.E. (I.T.)

SOFTWARE TESTING & QUALITY ASSURANCE

(2015 Pattern) (Semester - I) (414457C) (Elective - II)

1. What is configuration testing? Explain its objectives.
2. Explain 7 Quality management Principles of ISO 9000 series in detail.
3. Explain the process of Defect injection and prevention.
4. What is Software Process? Explain PSP and TSP in detail.
5. What is test automation? Explain scope of automation.
6. Discuss Defect removal effectiveness.
7. Explain Defect Bash Elimination.
8. Explain role of process in software quality.
9. Explain in detail what is clean-room software engineering?
10. Explain various components of the software quality assurance system.
11. Define the role of SQA Group.
12. Explain 5 levels of CMM & its Key Process Areas.
13. What is product quality? Compare product quality and process quality.
14. Explain compatibility testing with example.
15. What is software quality assurance? Explain software quality assurance planning.
16. Explain software process models in detail.
17. What is TMM? Explain various levels & benefits of TMM.

B.E. (Information Technology)

UBIQUITOUS COMPUTING

(2015 Pattern) (Semester - II) (414463)

1. Write short on: Personal area network
2. Write short note on: Routing and inter-networking
3. List and explain three main types of environment context
4. What are the features of ubiquitous computing?
5. Explain all core properties of pervasive computing?
6. Explain proxy-based service access and give its disadvantages?
7. Describe user models and its acquisition and representation?
8. Describe wireless data network with its types?
9. Explain three major types of robots?
10. Explain micro-actuation and sensing (MEMS) in detail?
11. Explain types of transparency mobile services?
12. Explain human entered design lifecycle in detail with diagram?
13. List out all handling limited key input and explain it in detail?
14. Explain multi-path routing in mobile ad hoc network (MANET) with neat diagram.
15. Define and explain all ways of addressing privacy in ubiquitous system?
16. Explain solov's taxonomy of privacy with diagram?
17. Describe all privacy difficulties and challenges of RFID tag?
18. Describe all challenges to privacy for ubiquitous computing?
19. Write short note on: Configuration management
20. Write short on: Body area network

B. E. (Mechanical) (Mechanical Sandwich)
ENERGY ENGINEERING
(2015 Pattern) (Semester - II) (402047)

1. Explain the concept of cascade efficiency.
2. In thermal power plant steam turbine of 11 MW capacity requires 5.1 kg of steam per hour per kW. The quantity of air leakage into the condenser is 1 kg per 1 ton of steam used by the turbine. The vacuum in the condenser is 71 cm of Hg and barometer reading is 760 mm of Hg. The temperature at the suction of air pump is 31 degree Celsius. The surface condenser is fitted with separate condensate extraction and air pump. The rise in the temperature of cooling water of condenser is 8 degree Celsius. The quality of steam entering condenser is 0.89 dry and no under cooling in the condenser. Determine :
 - a. The capacity of air pump per minute basis
 - b. Quantity of cooling water required in tones per minutes.
3. What is a purpose of coal beneficiation ? Explain flow in this process with suitable diagram.
4. Explain the methods used to control Nox in thermal power plant.
5. Write Note on following.

Flow duration curve and its use.
6. What do you mean by Supercritical Boiler? Explain the advantages of the same.
7. What are different methods for disposal of Nuclear waste?
8. Explain typical closed type condensing plant with simple diagram?

9. The air enters the compressor of a gas-turbine power plant at 1 bar, 30 degree Celsius and 162 tons per hour. The maximum cycle temperature, pressure are 650 degree Celsius, 5 bar respectively. The two stage expansion with reheating pressure of 2.24 bar is used in the plant. In the reheater gas is heated up to maximum cycle temperature. The isentropic efficiency of compressor, first turbine, and second turbine is 80%, 85%, 90% respectively. Take adiabatic index for air gas as 1.4, 1.33 respectively. Take specific heat for air, gas as 1 KJ/kg-K, 1.15 KJ/kg-K respectively. Neglect mass flow rate of fuel. Draw cycle arrangement and T-s diagram and determine.

- a. The thermal efficiency of cycle.
- b. Power output of plant in MW.

10. Explain General Layout of Diesel Power Plant indicating different systems.

11. Air enters the compressor of a gas-turbine power plant having capacity 12 MW at 1 bar and 27 degree Celsius. The maximum cycle temperature, pressure are 577 degree Celsius, 6.5 bar respectively. The two stage compression with perfect inter cooling arrangement is incorporated in the plant. The compression in both stages and expansion in turbine are isentropic. Take adiabatic index, specific heat for both air and gas as 1.4, 1 KJ/kg-K respectively. Assume calorific value of fuel as 45.5 MJ/Kg. Draw Cycle arrangement and T-s diagram and determine.

- a. Maximum work saved per kg of air compressed due to use of inter cooling.
- b. Fuel consumption in Tph (with inter cooling arrangement)
- c. The thermal efficiency of cycle with considering effect mass flow rate of fuel on air.

12. Explain the advantages, disadvantages and applications of diesel power plant.
13. Explain the superheated steam geothermal power plant with simple diagram.
14. Explain the Claude cycle for OTEC with component arrangement diagram.
15. What are applications of solar photovoltaic power systems?
16. Explain the working of open cycle MHD generator with simple figure.
17. Write Note on : Solar Chimney.
18. How wind turbines are classified?
19. What is function of circuit breaker in supply system? Explain working of air circuit breaker with simple sketch and list out its limitations.
20. Input output curve of 25 MW capacity generating power plant is given by $I = 5 \times 10^6 (7 + 0.2L + 0.1L^2)$ [I in kJ/hr and L in MW] then
- Determine:
- Average rate of heat supplied (heat supplied MW-hr) when plant operating at 25 MW load for 10 hours in a day and kept at zero load for 14 hours
 - Saving in heat rate if same energy is produced for whole day at constant load.
21. Write note on following :
- Generator cooling
 - Effects of short circuits
22. Explain following terms with its significance.
- Plant capacity factor
 - Plant use factor

B.E. (Mechanical Engineering)
ADVANCED MANUFACTURING PROCESSES (Elective - IV)
(2015 Pattern) (Semester - II)

1. Explain with neat sketch forming and list their applications.
2. Explain the construction and working of Ultrasonic welding.
3. Explain with neat sketch Magnetic pulse forming and list their applications.
4. List applications of adhesive bonding.
5. Explain with sketch working principle of Abrasive Water Jet machining with the process parameter.
6. Explain the process of underwater welding.
7. Explain with sketch working principle of wire electric discharge machining with the process parameter.
8. Write short note on welding of plastics and composites.
9. Explain how the ultrasonic micro machining carried out.
10. Explain the challenges in micro and nano fabrication process.
11. Write short note on Lithography.
12. Explain the need of micro machining.
13. Explain the process of focused Ion Beam Machining.
14. Write short note on Diamond micro machining.
15. Explain in detail post processing of parts manufactured by additive manufacturing processes.
16. Explain the generalized additive manufacturing process.
17. Write application of additive manufacturing processes in aerospace industry.
18. What are factors which play important role while designing the object which is manufactured by additive manufacturing?

- 19.** Explain any one Additive Manufacturing process with its principle, process steps and materials.
- 20.** Write application of additive manufacturing processes in medical technology.
- 21.** Explain in detail the importance of material characterization.
- 22.** Explain operating principle of Scanning Electron Microscopes with neat sketch.
- 23.** Describe the applications of microscope.
- 24.** Explain operating principle of Atomic Force Microscopes with neat sketch.
- 25.** Explain with sketch operating principle of X-Ray Diffraction Spectroscopy.
- 26.** Describe the applications of spectroscope

B.E. (Mechanical Engineering)
INDUSTRIAL ENGINEERING (Elective - III)
(2015 Pattern) (Semester - II)

1. Define productivity? Explain various factors which affect productivity?
2. Explain any two productivity models used in Industrial Engineering?
3. Enlist elements of an organization? Explain the term departmentalization in details?
4. Enlist any 4 objectives of an industrial engineering?
5. What are therblings? Give any 5 therblings with symbols?
6. Describe Travel chart following with suitable example.
7. Define the term:- work sampling.
8. In a work sampling study carried out in heat treatment shop, following data was collected
 - i) Total time spent by the operator = 450 minutes
 - i) Number of components produced = 150 No's
 - iii) Working time of the operator = 70%
 - iv) Idle time for operator = 30%
 - v) Avg. rating for operator = 90%Calculate the standard time for the component if total relaxation allowance is 30% of the basic time?
9. Define the term with suitable example:- MOST.
10. Compare : Work sampling and PMTS?
11. Explain SCM with flow diagram? Discuss its importance in industry?
12. Write a short note on
 - i) Aggregate planning
 - i) Push and Pull System
13. Discuss the importance of sales forecasting. Explain any one method of sales forecasting?
14. Discuss MRP-I and MRP-II with suitable example.
15. Enlist & Explain different computer aided layout design techniques?
16. Classify & Explain different types of material handling equipments?
17. Define Inventory and its importance. Enlist different types of Inventories? Also explain various costs involved with Inventory?

18. A manufacturing company requires 9000 units per year. Ordering cost is Rs. 125/- per order and carrying cost is 20%. Purchase price per unit is Rs. 42. Determine

- i) EOQ
- i) Optimum number of orders
- ii) Total cost including acquisition of material

19. Explain the term:- ABC analysis.

20. Write a short note on :

- i) KRA
- i) Break even analysis

20. What is cost accounting? What are objectives of cost accounting? Explain elements of cost.

21. What is industrial safety? What are the objectives of industrial safety? Explain general safety rules.

22. Calculate B.E.P. (In Unit and In Rupee) from the following information.

Fixed cost = Rs 1200/-

Variable cost = Rs 4000/-

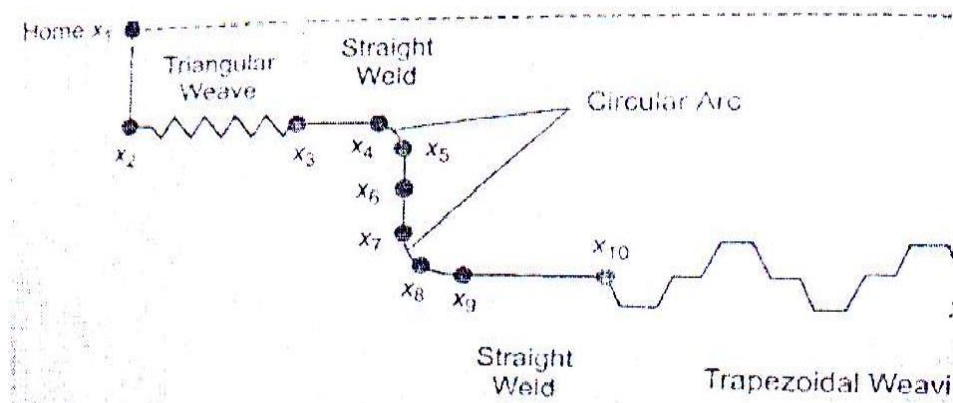
Sales in rupee = Rs 7000

Sales in unit = Rs 1000/-

23. Explain the term:- Payback method

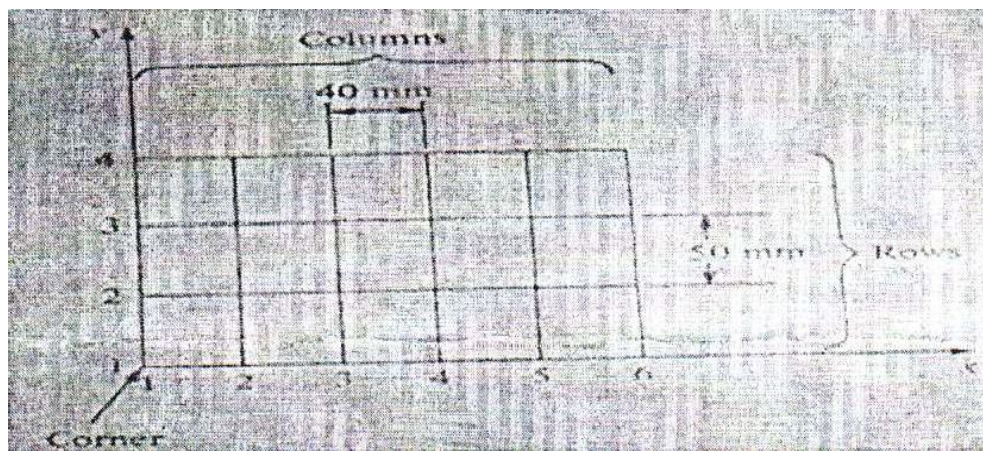
B.E. (Mechanical) (Semester - II)
ROBOTICS
(2015 Pattern) (Elective - III)

1. Explain Technical Specification (performance characteristics) of Robots.
2. Explain static force analysis of Robot Manipulator.
3. Discuss the classification of Grippers. Explain with neat sketch Vacuum gripper.
4. Explain the construction & working of Vision sensor used in robotic.
5. Classify Robot actuator. Discuss construction & working of Stepper Motor
6. Differentiate between Forward & Inverse Kinematic.
7. List out application of Robots. Explain any one in details with neat sketch
8. Write a short note on Position sensor in robotics
9. Explain types of potential field method for motion planning of manipulator
10. An actuated joint of six axis robot is to be rotated from 20° to 80° in 6 seconds.
 Determine coefficients of cubic polynomial to interpolate a smooth trajectory.
 Plot linear, quadratic and cubic trajectories for the joint.
11. Write a short note on
 - i) Steps in trajectory planning
 - ii) Robot Dynamic
12. The second joint of the SCARA manipulator is required to move from 30° to 150° in 5 seconds Find the cubic polynomial to generate a smooth trajectory of joint. Find the angle at which maximum velocity occurs for this trajectory
13. Explain with block diagram Machine vision system for Robots.
14. Write a Programme using VAL for following weld to be made



15. Explain the different steps involved in Segmentation.

16. Write a Programme using VAL for palletizing operation as shown in fig. The robot must pick up parts from an incoming conveyor & deposit them on to pallet. The pallet has four rows that are 50 mm apart & six columns that are 40 mm apart. The object to be picked up are about 25 mm tall.



17. Explain the forward & backward search technique in problem solving for AI.

18. What are different tools used in simulation of robotics.

19. Write a short note on

- i) Internet of things
- ii) Industry 4.0

20. Explain Need of AI & application of Artificial Intelligence for Robotics System.

B.E. (Mechanical) (Semester - II)
SOLAR AND WIND ENERGY
(2015 Pattern) (Elective - IV)

1. Explain present energy scenario and role of governing bodies for solar and wind energy.
2. Explain Solar tower with figure.
3. Explain any one solar measurement instrument with figure.
4. Explain solar distillation with figure.
5. Classify solar thermal collectors and describe flat plate collector with the help of suitable diagram.
6. Explain solar PV Cell with figure.
7. Classify solar concentrating collectors and explain point contact concentrator with figure.
8. Describe classification of solar cells based on type of active material.
9. Design a solar PV System wherein load consists of a CFL, TV, Fan, Refrigerator and Computer. The system should allow the use of loads in non sunshine hours. The operating hours and the power rating of these loads are given in following table.

Load	Watts	Hr/day	Numbers
CFL	18	6	10
Fan	70	4	8
TV(21")	250	2	2
Refrigerator	150	8	8
Computer	250	1	3

10. An evacuated tube solar water heating system is designed for daily hot water supply of 300 lit. The daily average solar global radiation is 780 W/m^2 . The inlet and outlet temperature of water is 25°C and 50°C . The effective sunshine hours are 7 hours. Calculate number of evacuated tube required if dimension of one tube is $1800\text{mm} \times \phi 57\text{mm} \times 47\text{mm}$. Calculate efficiency of the system.
11. Sketch the diagram of HAWT and explain function of its main components.
12. Describe main considerations in selecting a site for wind generators.

13. Explain analysis of aerodynamic forces acting on wind mill blades with figures.
14. Explain various design considerations for horizontal and vertical axis wind turbines.

15. A propeller type turbine has a following data :

Speed of free wind at a height of 10m = 15 m/sec

$\alpha = 0.14$

air density = 1.226 kg/m³

height of tower = 100m

diameter of rotor = 90m

wind velocity at turbine reduces by 25%

generator efficiency = 90%

Find total power available to wind, power extracted by wind turbine, electrical power generated, axial thrust on turbine, maximum axial thrust on turbine.

16. Explain in detail step by step design process for miniature wind mill.

17. Explain status of wind energy potential and installation in India.

B.E. (Mechanical) (Semester - II)
TRIBOLOGY
(2015 Pattern) (Elective - III)

1. List the various physical and chemical properties of lubricant and explain any five of them.
2. List the different theories of wear and explain Archard's wear theory in brief.
3. What is the difference between gasket and oil seal? Explain non-metallic gasket.
4. List the different methods to measure friction and explain pin-on-disc rig.
5. What are the factors affecting wear?
6. What do you understand by infinitely long journal bearing and infinitely short journal bearing? Comment on pressure gradient and load carrying capacity in both cases.
7. Differentiate between real and apparent area of contact.
8. A 360° hydrodynamic journal bearing has 50 mm diameter and 50 mm length. The journal is carrying a load of 15 kN and rotating at a speed of 1450 rpm. The eccentricity ratio is 0.75. If the radial clearance is 20 microns, Calculate :
 - i) The minimum oil-film thickness;
 - ii) The viscosity of oil;
 - iii) The quantity of oil in circulation;
9. Derive an equation for load carrying capacity for given instantaneous velocity of approach and film thickness in case of circular plate approaching a plane.
10. Explain squeeze film lubrication. State and explain any six practical examples of squeeze film.
11. Derive equation for friction and pumping power losses in hydrostatic bearings.

12. Following data is given for a hydrostatic thrust bearing :

Supply pressure	=	5 N/mm ²
Shaft diameter	=	400 mm
Specific gravity of oil	=	0.86
Specific heat of oil	=	1.76 kJ/kg °C
Oil viscosity	=	30 cP
Film thickness	=	0.15 mm

Find :

- i) The load carrying capacity of bearing;
- ii) The flow requirement in l/min;
- iii) The frictional power loss;
- iv) The pumping power loss, and
- v) The temperature rise

Assume that the total power loss in the bearing is converted into frictional heat.

13. The two parallel plates of 30 mm length and infinite width are separated from the plane by an oil- film of 25 μ m thickness and having viscosity of 0.65 N-s/m². If the normal load per unit width of 15 kN/m is applied on the plate, determine :

- i) The time required to reduce the film thickness to 2.5 μ m
- ii) The maximum pressure

14. Write short notes on

- i) Gas lubricated bearings
- ii) Features of gas lubricated bearings

15. What do you understand by gas lubricated bearings? Compare gas lubricated bearings with oil lubricated bearings based on following parameters

- a. Viscosity of lubricant
- b. Viscous resistance
- c. Frictional power loss

16. Write Ertel-Grubin equation with all specific terms and also write the limitations of this equation.

17. Explain in brief, working principle of hydrostatic gas lubricated bearings.

18. Write short note on: selection of coatings.

19. State and discuss the lubricant and lubricating method for gears.

20. Write short notes on :

- a) Lubricant and lubricating method for rope and chain
- b) Lubrication system in I.C. engine

$\frac{l}{d}$	$\frac{h_0}{c}$	ϵ	S	$\left(\frac{r}{c}\right)_f$	$\frac{Q}{rcn_s l}$	$\frac{Q_s}{Q}$	$\frac{P_{max}}{P}$
1	0.00	1.00	0.0000	0.000	0.000	1.0000	0.0000
	0.03	0.97	0.00474	0.514	4.820	0.973	6.579
	0.10	0.90	0.0188	1.050	4.740	0.919	4.048
	0.20	0.80	0.0466	1.700	4.620	0.842	3.195
	0.40	0.60	0.1210	3.220	4.330	0.680	2.409
	0.60	0.40	0.2640	5.790	3.990	0.497	2.066
	0.80	0.20	0.6310	12.800	3.590	0.280	1.890
	0.90	0.10	1.3300	26.400	3.370	0.150	1.852
	1.00	0.00	∞	∞	3.142	0.0000	0.0000

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B.E. (Mechanical/Machanical Sandwich)
MECHANICAL SYSTEM DESIGN
(2015 Pattern) (Semester - II) (402048)

1. State and explain the parameters used in kinematic design of gearbox
2. Explain design and natural tolerances.
3. Define the following terms:
 - i) Population
 - ii) Sample
 - iii) Random variables

Also explain the concept of reliability based design

4. Explain the steps involved in belt conveyor analysis?
5. A three idler through belt, horizontal conveyor is to be used used for transporting 500 ton/hr of coal having weight density 8000 N/m^3 . The surcharge factor 'c' for three idler through belt is 0.1. If the belt speed is 100 m/min. Select the standard belt width for conveyor belt. Available standard belt width is : 400, 450, 500, 650, 750, 800, 900, 1000, 1200, 1400, 1600, 1800, 2000 mm.
6. Explain the concept of containerization.
7. A three idler, troughed belt, horizontal conveyor is to be used for transporting 500 ton of iron per hour having mass density of iron ore is 1700 kg/m^3 . If the belt speed is 2m/sec, determine the required belt width. Take surcharge factor = 0.1.
8. Explain, with the help of neat sketches, the different types of formed heads used as end closures in cylindrical pressure vessels.
9. A high pressure compound cylinder consists of a inner and outer diameters of 300 mm and 400 mm OD respectively. It is jacketed by an outer cylinder of 500 mm outside diameter. The tubes are assembled by a shrinking process in such a way that the maximum principal stress induced in any tube is limited to 100 N/mm^2 . Calculate the shrinkage pressure and original dimensions of the tube assuming $E = 210 \text{ GPa}$.
10. A pressure vessel consists of a cylindrical shell with an inner diameter of 1500 mm and thickness of 20mm. It is provided with a nozzle of inner diameter 250 mm and thickness 15 mm. The yield strength of the material for the shell

and the nozzle is 200 N/mm^2 and the design pressure is 2.5 Mpa . The extension of the nozzle inside the vessel is 15 mm . The corrosion allowance is 2 mm , while the weld joint efficiency is 0.85 . Neglecting the area of welds, determine whether or not a reinforcing pad is required for the opening. If so, determine, the dimensions of the pad made from a plate of 15 mm thickness.

11. Explain the buckling of connecting rod? Why I section preferred for connecting rod?

12. The following data is given for the piston of four stroke diesel engine.

Cylinder bore = 100 mm , Material of piston rings = grey cast iron,

Allowable tensile stress = 90 N/mm^2

Allowable radial pressure on cylinder wall = 0.035 MPa

Thickness of piston head = 16 mm

Number of piston rings = 4

Calculate:

- i) Radial width of piston rings;
- ii) Axial thickness of piston rings;
- iii) Gap between the free ends of piston ring before assembly and after assembly;
- iv) Width of top land;
- v) Width of ring grooves;
- vi) Thickness of piston barrel; and
- vii) Thickness of barrel at open end.

13. The following data is given for the connecting rod of a diesel engine.

Cylinder bore = 85 mm

Length of connecting rod = 350 mm

Maximum gas pressure = 3 MPa

Factor of safety against buckling failure = 5

(l/d) ratio for piston pin bearing = (1.5)

(l/d) ratio for crank pin bearing = (1.25)

Allowable bearing pressure for piston pin bearing = 13 MPa

Allowable bearing pressure for crank pin bearing = 11 MPa .

length of stroke = 140 mm

Mass of reciprocating parts = 1.5 kg

Engine speed = 2000 rpm

Thickness of bearing bush = 3 mm

Material of cap = 40 C8 ($S_{yt} = 380 \text{ N/mm}^2$)

Material of bolts=Alloy steel ($S_{yt} = 450 \text{ N/mm}^2$)

Factor of safety for cap and bolts = 4 and 5 respectively.

Density of connecting rod = 7800 kg/m^3

Determine:

- a) Dimensions of the cross-section of connection rod.
- b) Dimensions of small and big end of bearings.
- c) Nominal diameters of bolts for the cap.
- d) Thickness of cap; and
- e) Magnitude of whipping stress.

14. Differentiate between optimum design problems with normal specifications and redundant specifications.

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B.E. (Mechanical Sandwich)
CAD/CAM and AUTOMATION
(2015 Pattern) (Semester - II) (Elective - I)

1. Discuss the rotation matrices for rotation about X, Y and Z axis.
2. Discuss inverse transformation and its use in computer graphics.
3. A line PQ with vertices P (2, 5), Q (6, 7) is rotated by 45° clockwise about a point R(1, 1) determine the new coordinates.
4. Discuss Boolean operations in Constructive Solid Geometry.
5. Discuss application of hermit cubic spline surface.
6. A line is represented by the endpoints P (2, 4) and Q (-3, 6). If the value of Parameter u at P and Q is 0 and 1 respectively, determine the equation of the line. Also determine the coordinate of point on the line at $u = 0.25, 0.5$ and 0.75 .
7. two bar Truss is shown in Fig 1. Determine nodal displacements, support reactions and element stresses. Area of both element is 1000 mm^2 and $E = 200 \text{ GPa}$.

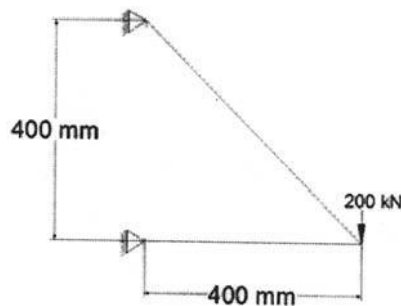


Fig. 1

8. Discuss working principles of CNC Turning center and Milling center.
9. Write CNC program using G and M codes to turn the component shown in fig. 2 having Stock size is $\phi 50 \text{ mm}$. Use canned cycles wherever applicable. Assume suitable data for speed and feed.

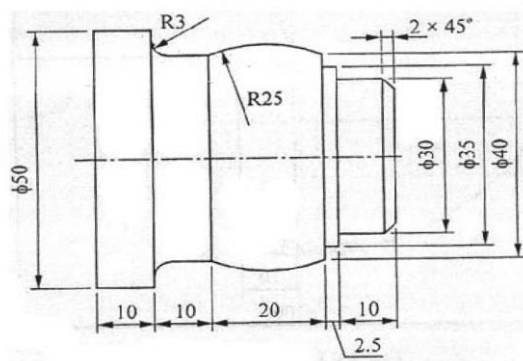


Fig. 2

10. Write CNC program using G and M codes to contour, face and drill the component shown in fig. 3. Use canned cycles wherever applicable. Thickness of blank is 7 mm. Assume suitable data for speed and feed.

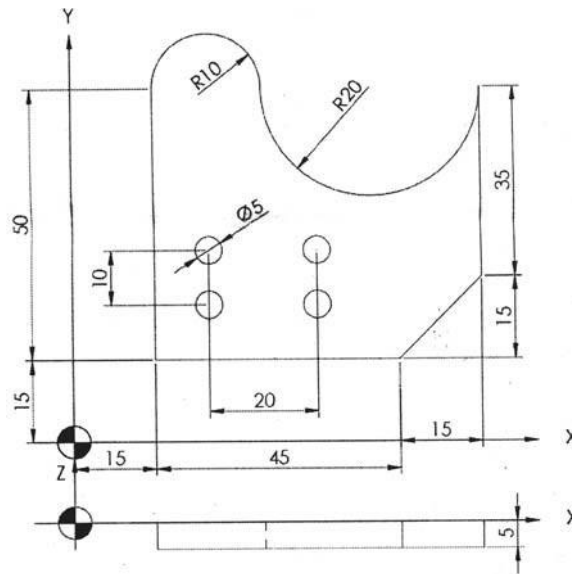


Fig. 3

11. Discuss steps in developing CNC part program in detail.

12. Discuss the elements of Product Life Cycle.

13. Discuss the 4D Rapid prototyping concept.

14. Explain working principle of Stereo Lithography Apparatus method for rapid prototyping.

15. Discuss Collaborative Engineering with suitable example.

16. Discuss types of flexible manufacturing systems with suitable example.

17. Discuss the laws of Robotics with suitable example.

18. Discuss types of coding methods of Group Technology and explain any one in brief.

19. Discuss Computer Aided Process Planning.

B.E. (Mechanical Sandwich)
Computational Fluid Dynamics
(2015 Pattern) (Semester - II) (Elective - I)

1. Write the Momentum equation in differential form and explain the each term with significance.
2. Write the significance of initial and boundary conditions in fluid flow analysis. Why solution initialization is necessary in transient numerical problems?
3. Define curl of velocity. Give an example of practical application of curl of velocity.
4. Explain the concept of conservation and non-conservation principle using suitable example.
5. Derive the discretized form of the steady, one-dimensional, heat conduction equation.
6. Explain the term order of accuracy using Taylor series expansion and its truncation.
7. Discretize the two-dimensional heat conduction, equation using explicit discretization method.
8. Discretize the one-dimensional transient convection diffusion equation using suitable discretization method. Discuss the accuracy of the scheme.
9. Develop an algorithm to solve problem of incompressible flow over an airfoil.
10. Discuss the challenges in solving Navier-Stokes Equations numerically? Suggest two remedies to overcome these challenges
11. Explain Dirichlet boundary condition with an example.
 12. Derive an expression of first order upwind scheme.
 13. Derive finite volume discretized expression for two-dimensional advection equation using suitable approach.

14. Write down the stepwise procedure to solve the lid driven cavity problem using any commercial software. Draw the neat sketches.
15. Write short note on SIMPLE algorithm.
16. Give practical example of real life problem where one-equation turbulence model is used. Explain any “one-equation” turbulence model in detail.
17. Write a note on Reynolds Averaged Navier-Stokes Equations.
18. Write in detail CFD analysis process with pre-processing, solver and post-processing for aerodynamic analysis of formula one car. Highlight some of the crucial issues in numerical analysis.
19. Why turbulence modeling is required in numerical analysis?

B.E. (Mech Sndwitch Engg)
Energy Audit & Management (Elective - II)
(2015 Pattern) (Semester - II)

01. Define with example.

- i) Primary and secondary energy.
- ii) Commercial and non-commercial energy.

02. Explain energy consumption pattern of global Industry.

03. Write short note on energy policy.

04. List all requirements of energy action planning.

05. Explain any four strategies for better energy security of the nation.

06. Distinguish between preliminary energy audit and detailed energy audit. How does a preliminary energy audit help conduct detailed energy audit?

07. Calculate net present value and IRR for the project which has following cash flow. Discount rate 10%.

Investment	Rs. 10,00,000
Saving in year	Cash flow (Rs)
1	2,00,000
2	2,00,000
3	3,00,000
4	3,00,000
5	3,50,000

08. Consider 2 projects A & B with the initial investment Rs. 80,000. The project life times are 5 years in case. The saving in each of the 5 years for the two projects are as shown in following table. ROI = 20%

	Project A	Project B
Capital Cost (Rs)	Rs. 80,000	Rs. 80,000
year	Cash flow(Rs)	Cash flow(Rs)
1	10,000	30,000
2	20,000	40,000
3	30,000	30,000
4	40,000	20,000
5	50,000	10,000

- 09.** A company borrows Rs 30000 to finance a new boiler installation. If the interest rate is 12% per annum & repayment period is 6 years. Calculate the value of total repayment & monthly repayment value for.
- Simple interest.
 - Compound interest.
- 10.** What are the different heat losses occurring in oil fired furnace? Explain in brief.
- 11.** Explain the energy saving opportunities in compressed air system.
- 12.** What are the parameters to be monitored for evaluating 'direct efficiency' of boilers and what is the empirical relation used?
- 13.** What are the factors affecting energy efficiency of electric motor?
- 14.** Explain the following terms:
- Power factor.
 - Maximum demand.
- 15.** The lighting connected load for the small industry consisting of 140 fluorescent tubes of 55 W each with magnetic ballast. In first option, the magnetic ballast of fluorescent tubes reduces to 40 W. Calculate the simple payback period of above replacement if cost of electronic ballast is Rs. 110. In second option, fluorescent tubes are replaced by energy efficient fluorescent tubes of 20 W & cost of Rs. 450 each. Calculate simple payback period. Which energy saving option is better & why? consider usage of 16 hrs per day & an electrical tariff of Rs4. per kwh.
- 16.** What are the benefits of waste heat recovery system
- 17.** Why cogeneration system play an important role in any industry
- 18.** Explain lux meter with diagram.
- 19.** Write a note on following with example.
- Carbon credit.
 - Bottoming cycle.
 - Heat pipe.
 - CDM project.

B.E. (Mechanical Sandwich)
FINITE ELEMENT ANALYSIS
(2015 Pattern) (Semester - II)

1. State different types of analysis used in Finite Element Analysis. Explain any TWO of them.
2. Explain the term shape function. Write the properties of Shape Function.
3. How Pascal triangle is used to determine a shape function for two-Dimensional elements? How rigid body displacement and constant strain rate is taken into account in these polynomial terms?
4. State properties of stiffness matrix.
5. For the plane truss as shown in figure I, take $E = 2 \times 10^5 \text{ N/mm}^2$, $A = 200\text{mm}^2$
Determine : 1. Nodal Displacement 2. Support Reactions 3. Element stress.

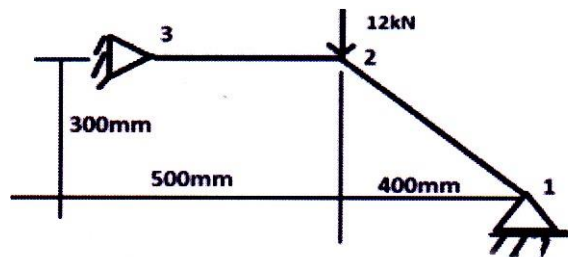


Figure 1

6. Explain in detail Galerkin weighted residual method.
7. Explain CST and LSR elements.
8. Write a short note on :
 - a. Area Coordinate of the triangular Element and Natural coordinates.
 - i) Higher order triangular and quadrilateral element.
9. Write a note on uniqueness of mapping. How the Jacobian matrix used to check uniqueness of mapping?

10. Write difference between P refinement and h refinement.

11. Determine integration of following function by using Gauss 2- Point and 3- Point integration method and compare with exact solution.

$$\int_2^8 x dx$$

12. Write down governing equation of steady state heat transfer. Also write down element stiffness matrix and compare it with bar element.

13. Consider a composite slab consist of three materials with thermal conductivities $20 \text{ W/m } ^\circ\text{C}$, $40 \text{ W/m } ^\circ\text{C}$ and $60 \text{ W/m } ^\circ\text{C}$ and thickness 0.2 m , 0.3 m and 0.3 m respectively. The outer surface is at $20 \text{ } ^\circ\text{C}$ and inner surface is exposed to the fluid having convective heat transfer coefficient of $25 \text{ W/m}^2 \text{ } ^\circ\text{C}$ and temperature $800 \text{ } ^\circ\text{C}$. Determine temperature distribution within the slab.

14. Determine the temperature distribution along the length of the rod (at $L/4$, $L/2$, $3L/4$ and L) as shown in figure 3, The rod with radius 25 mm is insulated at the perimeter. The left end has a constant temperature of $40 \text{ } ^\circ\text{C}$ and a free stream temperature is $-10 \text{ } ^\circ\text{C}$, Take, $K = 35 \text{ W/m } ^\circ\text{C}$, $h = 55 \text{ W/m}^2 \text{ } ^\circ\text{C}$.

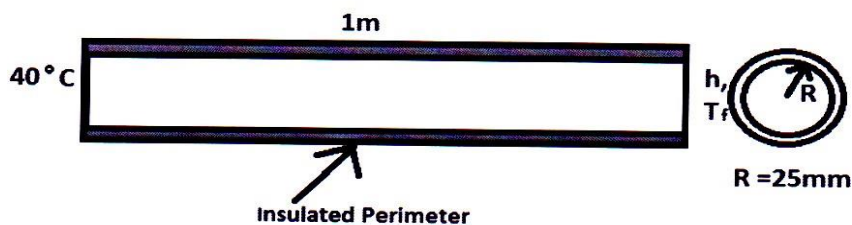


Figure 3

15. Write a lumped and consistent mass matrix for Bar Element and Truss Element.

16. Find the natural frequencies of longitudinal vibrations of the same stepped shaft of area A and $2A$ of equal length(L), as shown in figure 4. Use consistent mass matrix.

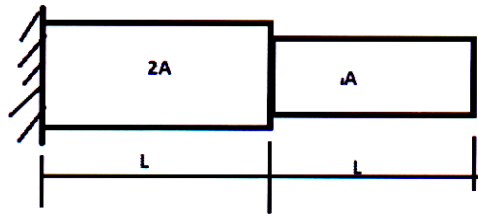


Figure 4

17. Explain each term of dynamic equation and explain importance of Eigenvalues and Eigen vectors.

18. Find the natural frequencies of longitudinal vibrations of the same stepped shaft of area A and $2A$ of equal length(L), as shown in figure 5. Use Lumped mass matrix.

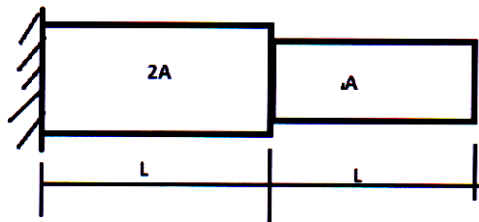


Figure 5

B.E. (Mechanical-Sandwich)
Mechanical Vibrations
(2015 Pattern) (Semester - II)

1. Define the following terms :

- i) Natural frequency
- ii) Critical damping coefficient
- iii) Damping Factor
- iv) Logarithmic Decrement

2. A right circular cylinder of mass 'M' and radius 'a' is connected to a spring of stiffness 'k' at a distance 'd' above its center as shown in figure. The cylinder is free to roll on horizontal rough surface without slipping. Derive the equation of motion and hence find natural frequency of small angular oscillations of the cylinder.

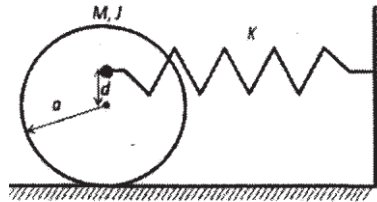


Figure: Q 1 b)

3. Draw the time-displacement graph of free vibration of 1-dof viscously damped system for different damping conditions :

- a. zero damping,
- ii) under damping,
- iii) critical damping and
- iv) over damping.

4. A room door is equipped with a hydraulic door closure system with torsional spring of stiffness 20 N-m/rad and a torsional viscous damper. The door has a mass of 50 kg and a centroidal mass moment of inertia about an axis parallel to the axis of door rotation is 5 kg-m². The length and height of door are 0.9 m and 2.1 m respectively. Determine-

- a. the undamped natural frequency of the door
- b. the required torsional damping coefficient of the door closure system for critically damped motion.

5. Explain the method of finding damping factor of a system by using quality factor.

6. A spring-mass-damper system of mass 120 kg, spring stiffness 60 kN/m and damping coefficient 1 kN-s/m is subjected to excitation force of $f(t) = 150 \sin(18t)$ N. For steady state vibrations of the system, determine
- Amplitude of displacement of mass
 - Phase angle of displacement of mass with respect to $f(t)$
 - Amplitude of acceleration of mass
 - Maximum dynamic force transmitted to the support
7. With neat diagram distinguish between the transverse and torsional vibration.
8. A rotor of 12 kg mass is mounted midway on a horizontal shaft of diameter 2.5 cm which is simply supported with a span of 90 cm in bearings at both the ends. The center of gravity of the rotor is 0.02 mm offset from its axis of rotation. The modulus of elasticity of shaft material is 200 GPa. Determine -
- Static deflection of rotor
 - Critical speed of shaft
 - Amplitude of steady state vibrations of rotor and dynamic load on each bearing at a speed of 3000 rpm.
9. Explain the matrix method to determine natural frequencies and mode shapes of a multi-dof (2-dof) system by solving eigen value problem.
10. For the system of spring and masses shown in the figure, derive differential equations of motion in terms of displacement x_1 and x_2 of masses. Determine natural frequencies and corresponding mode shapes. Describe the mode shapes graphically.

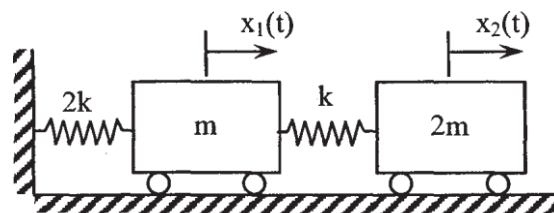


Figure: Q 5 b)

11. What do you mean by principal mode of vibration and mode shape?

12. For a system of spring, mass and pulley as shown in figure, derive differential equations of motion in terms of absolute displacement x of mass m_1 and angular displacement θ of pulley. Find natural frequencies of the system and mode shapes. The cord connecting the springs is inextensible and there is no slip between the cord and pulley. Take $m_1 = 10\text{kg}$, $m_2 = 40\text{kg}$, $k_1 = 1\text{ kN/m}$, $k_2 = 2\text{ kN/m}$ and $r = 200\text{ mm}$.

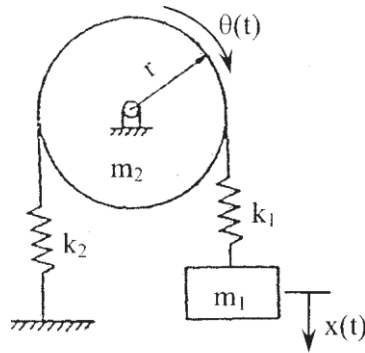


Figure: Q No 6 b)

13. Differentiate between static and dynamic balancing. Why there is a need of accurate dynamic balancing of high speed machines?

14. A rotating shaft carries four masses A, B, C and D at radii 110, 140, 210 and 160mm respectively. The planes in which the masses revolve are spaced 700 mm apart and the masses of B, C and D are 12 kg, 7kg and 5 kg respectively. Find the mass A and relative angular positions of all the four masses so that the shaft is in complete balance.

15. Explain the concept of partial balancing in single cylinder IC engine.

16. A four stroke four cylinder inline engine has firing order of 1-4-2-3. The length of crank and connecting rod are 80 mm and 320 mm respectively. The angular position of cranks is at equal angles and engine cylinders are at 180 mm apart. The mass of reciprocating parts of each cylinder is 3 kg. Determine unbalanced primary and secondary forces and couples at a speed of 2000 rpm.

17. Explain in brief various methods and techniques for vibration control.

18. Explain with neat sketches the working principle of seismic sensor for vibration measurement.

19. A vibration pick-up has a natural frequency of 5.75 Hz and a damping factor 0.65. Determine the lowest frequency beyond which the amplitude can be measured within 2% error.

20. Explain with neat labeled sketches a typical arrangement of vibration measurement system.

21. Write a short note on the undamped dynamic vibration absorber

22. Explain the method of vibration based condition monitoring of machines.

B.E. (Automobile Engineering)
AUTOMOTIVE NVH
(2015 Course) (Elective -III)

01. Enlist the different types of vibrations. Explain each one in short
02. Explain decibel addition, subtraction and averaging with derivation.
03. What are the adverse effects caused to Machine, Structure and Human being.
04. Explain in detail Vehicular Noise Measurement Techniques?
05. What do you mean by Noise Control along the path? Discuss it in brief.
06. Describe in detail untuned dry friction damper & draw its Frequency response curve.
07. Enlist the different steps involved in the Vibration Control.
08. Derive the equation for two degree of freedom undamped system.
09. How to control torsional oscillations amplitude in engine crank shaft?
Describe its procedure in detail?
10. List down the different methods of vibration control. Explain any one of them in short.
11. Discuss the characteristics of Sound Wave in brief.
12. Explain in detail Interior Noise in a Vehicle
13. Enlist the types of the Noise measuring instruments. Explain Microphone as Noise measurement device in detail.
14. Discuss in brief Ambient Emission Noise standards in India.
15. Write a note on Engine Noise Control.

B.E. (Automobile Engineering)
AUTOMOTIVE SYSTEM DESIGN
(2015 Pattern) (Semester - II) (416496)

01. The multi plate clutch is to transmit 6kW at 800rpm. The Inside radius is 38mm and outer radius is 70 mm. Coefficient of friction 0.1. Maximum pressure is 350 kN/m². Determine axial force required total number of disc and average pressure.
02. An engine develops 28 kW at 1500 rpm and its bottom gear ratio is 3.06. If a propeller shaft of 40mm outside diameter is to be used, determine the inside diameter of mild steel tube to be used, assuming a safe shearstress of 55×10^3 kPa for MS.
03. Discuss about clutch frictional materials and their properties.
04. Explain in brief about under steer and over steer.
05. A light motor vehicle has a wheel base of 2.64m, the height of its CG above the ground is 0.61m and it is 1.12 m in front of the rear axle. If the car is travelling at 40km/h on a level track, determine the minimum distance in which the car may be stopped, when,
 - i) The rear wheels are braked.
 - ii) The front wheel are braked.
 - iii) All wheels are braked.
06. What is the braking efficiency? Explain in detail.
07. Discuss the general design considerations of suspension system.
- 08 Discuss on:
 - a) What is nipping in leaf springs?
 - b) Brake fade and Brake torque.
 - c) Brake balance and Braking efficiency.
 - d) Components used in hydraulic brake sys
09. Explain about aspects of Aesthetic Design.
10. Narrate about the torque tube drive.

11. Explain the classification of gearbox

12. An automobile gear box gives 3 forward speeds and one reverse with a top gear of unity and bottom and reverse gear ratio of approximately 3.3:1. The center distance between the shafts is to be 110 mm approximately. Gear teeth of module 3.25 mm. find the number of gear teeth

B.E. (Automobile Engineering)
AUTOMOTIVE SYSTEMS AND TESTING
(2015 Pattern) (Semester-II)

1. What are the different types of Suspension systems? Explain any one.
2. Write a note on tyre rotation and matching.
3. What is the use of anti roll bar?
4. Write a note on vehicle performance parameters.
5. Explain EGR system with neat sketch.
6. What is catalytic converter? Explain any one.
7. Write a note on mechanism of noise generation.
8. What is Passer by noise test? Explain with neat sketch.
9. Explain Hydro-elastic suspension.
10. What is need of Shock Absorber?
11. What are the different types of testing tracks? Explain any one in brief.
12. Explain:
 - a. Deep water through shallow water.
 - b. Corrugated Track.
13. Differentiate Active safety and Passive safety.
14. What are the different types of seats? Explain any one in brief.
15. What are the different types of Crash Testing? Explain any one.

B.E. (Automobile Engineering)
HYBRID ELECTRIC AND FUEL CELL VEHICLE
(2015 Course) (Semester - II) (416497(B))

1. Explain operation modes of series hybrid (electrical coupling).
2. Explain pneumatic hybrid power train.
3. Enlist type of accumulator? Explain gas loaded accumulator.
4. What are different drive train configurations of hybrid vehicle?
5. Explain parametric design of drive train.
6. Explain charging and discharging of lead acid battery with its chemical reaction.
7. Explain basic terms of battery performance and characterization.
8. Explain design consideration of battery.
9. Explain selection of battery in EHV.
10. Explain solid oxide fuel cell with neat sketch.
11. With neat sketch explain Direct methanol fuel cell (DMFC).
12. Explain Fuel Cell Electric Vehicle with neat layout. Also give advantage of same.
13. Explain Solar panel for vehicle with advantage, disadvantage and application.
14. What is EV? Explain conceptual illustration of EV.
15. With neat sketch explain working of hydraulic motors.

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B.E. (Automobile Engineering)
TRANSPORT MANAGEMENT & MOTOR INDUSTRIES
(Elective-IV) (2015 Course) (Semester - II) (416498 B)

- 01.* What is zero depth insurance?
- 02.* Explain the benefits of warranty system.
- 03.* Explain the effect of non-payment of tax.
- 04.* Explain fire insurance, machine insurance & vehicle insurance
- 05.* What is depot? Draw and Explain layout for S T Depot.
- 06.* Explain in detail management information system for goods transport operation.
- 07.* Write down road offences and penalties for the same.
- 08.* Enlist the authorities to collect tax. Explain any two of them
- 09.* Explain in detail fleet management & fleet maintenance for transport operation & write down its advantages.
- 10.* Explain in detail modes of transport.
- 11.* Explain VRDE in detail.
- 12.* Write a note on storage & transportation of petroleum product.
- 13.* Write a note on MSRTC, BEST, PMT bus service.
- 14.* Explain the economic factors that influences the goods transport operation.
- 15.* What is global positioning system? Explain its function and role in automobile industry.

B.E. (Chemical)
Energy Conservation in Chemical Process Industries
(2015 Pattern) (End Semester)

1. Give the checklist for energy conservation in motors and transformers.
2. Discuss the energy conservation act-2001 and its features.
3. Enlist activities for promoting energy conservation in present status.
4. Give the Classification of energy sources.
5. Discuss the organization of energy conservation programs at plant level, division level and corporate level.
6. State Energy Management & discuss the objectives of Energy Management.
7. How and where the energy losses can be minimized in coolers.
8. Explain the role, responsibilities and duties of energy manager.
9. Write in details elements of energy management program.
10. Explain waste minimization and its classification, housekeeping, process change.

B.E. (Chemical Engineering)
FOOD TECHNOLOGY
(2015 Pattern)(End Sem)

1. How evaporation is useful in food processing? Illustrate with suitable examples.
2. Write the short notes on Canning & sterilization.
3. Draw and explain the unit operations necessary in food engineering.
4. Draw and explain the ice cream production with preservation.
5. Write a note on bar code and other markings printed on food packets. Also explain combined packaging system.
6. Justify- "The concepts of rheology are useful in food quality assurance."
7. Explain the roasting and hot oil frying theory in detail.
8. Write the short notes on Laws of size reduction for food grains processing
9. Write the short notes on Food Additives.
10. Draw a milk powder processing flow diagram with stepwise procedure.
11. Write a note on US Food and drug administration.
12. Enlist the different ways to categorize the cheese and explain any one in details.
13. Describe 'Active packaging'. Enlist and explain the various factors included in it.
14. Write the advantages and disadvantages of extrusion cooking and hydrostatic pressure-cooking methods.

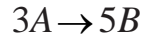
B.E. (Chemical)

PROCESS ENGINEERING COSTING & PLANT DESIGN (2015 Pattern) (Semester - II)

1. Draw & Explain the tree diagrams showing the cash flow industrial operations
2. Explain general procedure for determining optimum condition using analytical method.
3. Explain break even chart for production with its significances.
4. Explain the HAZOP study in details.
5. Explain factors affecting on processes selection.
6. Find the values of X,Y,Z that minimize the functions $X + 2Y_2 + Z_2$ subject to that $X+Y+Z=1$ making use of the Lagrangian Multitier.
7. Write a note on optimum flow rate of cooling water in condenser.
8. Prepare the techno-economic feasibility report for XYZ fertilizer plant.
9. Differentiate between PERT and CPM. Illustrate the same with suitable examples.
10. Using the optimization, calculate the design cost of Heat exchanger in details.
11. Explain types of insurances & taxes.

B.E.(Chemical Engineering)
PROCESS MODELING AND SIMULATION
(2015 Pattern) (Semester-II) (Paper-I)

Q1) Develop the complete batch-reactor model for a exothermic elementary reaction:



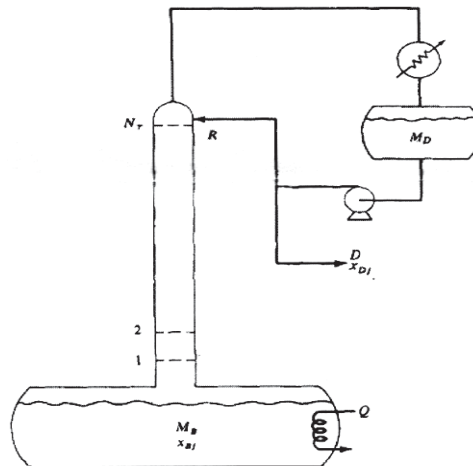
Derive the overall material balance, component balances and energy balance equations starting from the basic laws of conservations. The reactor is jacketed and the temperature is controlled by a coolant flow F_{co} through the jacket. If the reactor temperature is controlled by a proportional controller with gain K_c , explain the modification to be done in the final energy balance equation to accommodate the control law.

Q2) Define mathematical modelling and explain the types of models. Describe process simulation and mention its scope.

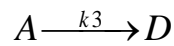
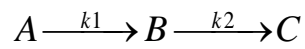
Q3) Derive the model equation for the laminar flow of a fluid through a packed bed column.

Q4) Develop the dynamic model of a double pipe heat exchanger operating on a continuous basis. Draw schematic of the heat exchanger and state the assumptions.

Develop the model of a differential distillation for a binary system as shown in the figure. The system consists of a still pot containing a heater in which the liquid mixture is present. The column containing N_T trays is attached to the pot and separates the binary mixture in a stage- wise manner over time. Mainly derive the material and component balance relations for the still pot, the intermittent tray, the top tray, the reflux drum and the energy balance relation for the still pot.



Q6) A batch reactor carries out the following series-parallel reactions:



The reactions obey 1st-order kinetics and are endothermic. Thus the reactor is heated by passing steam in the reactor jacket at a volumetric flowrate of F_{so} . Develop the complete model of the process. Enlist all the assumptions.

Q7) Explain the following types of numerical methods used in the solution of different types of process models with examples:

- a) Numerical integration methods to solve differential equations.
- b) Numerical methods to solve linear and nonlinear algebraic equations.

BE CIVIL
ADVANCED CONCRETE TECHNOLOGY
(2015 Course) (Semester - I) (End Sem.) (Elective - I) (401004C)

1. Write a short note on Self curing concrete.
2. Explain the basic concept of using fibers in the concrete composite. Explain the role of fibers improving the mechanical properties under tension and bending.
3. What are the different types of fibers used in the construction industry? Write the properties and application.
4. Enlist different metallic fibers. Explain their any two properties in brief.
5. What are the factors affecting strength of concrete? Describe the influence of gel space ratio on strength of concrete.
6. Write a short note on green concrete.
7. Define the fiber reinforced concrete composite? Enlist different naturally occurring fibers. Explain any two in brief.
8. Explain grading curves of aggregate. How grading of aggregates affect on properties of concrete.
9. What are the different tests conducted on cement mortar as a ferrocement material? Explain any one in detail.
10. Explain closed mould technique for ferrocement with merits and demerits.
11. Explain the properties and specifications of ferrocement material.
12. Write a short note on Geo polymer concrete.
13. What are the factors affecting the fiber interaction with matrix?
14. Describe the SIFCON material with reference to definition, structure properties and its application.
15. Explain stress strain property and compressive strength properties of FRC.
16. Explain the behavior of hardened steel fiber reinforced concrete under compression?
17. Which are the quality control tests conducted for steel fiber reinforced concrete composites.
18. Enlist factors affecting ferrocement material in fresh and hardened state, Explain the effect of water cement ratio on properties of ferrocement material?
19. Explain skeletal armature method of ferrocement along with merits and demerits.
20. Explain the behavior of hardened polymeric fiber reinforced concrete under flexure?

BE CIVIL
ADVANCED STRUCTURAL DESIGN
(2015 Course) (Semester - II) (Elective -III)

- Q1)* A column of length 4m is subjected to a concentric load of 75kN. Design the column using cold form section.
- Q2)* What are composite slabs? Explain how shear studs are designed.
- Q3)* Derive from the fundamentals the collapse load for a restrained circular slab of diameter D. The load may be considered to be uniformly distributed.
- Q4)* A two - way restrained slab is of size $L \times B$. Derive the equation of collapse load. Consider the load to be uniformly distributed.
- Q5)* An elevated square water tank is 3 m in size and 3m high. It is supported on a concrete staging of 4 columns. The height of the staging is 10m. Bracings are provided at a vertical spacing of 2.5m. The circular columns of the staging are 500mm in diameter. The structure is located in Zone III. Assume suitable dimensions for various elements and mention them clearly. Analyze the tank for tank full condition.
- Q6)* Explain the design procedure for RC shear wall.
- Q7)* What is the function of shear wall? How is the reinforcement calculated? Sketch typical reinforcement details.
- Q8)* What do you understand by the term mechanism in a steel frame? How is it formed and how are they identified?

BE CIVIL
ADVANCED TRANSPORTATION ENGINEERING
(2015 Pattern) (Semester - II) (Elective - IV) (401010 B) (Theory)

1. Differentiate between growth factor models and synthetic models of trip distribution.
2. Explain the severity levels and extent level of distress in rigid pavements with the help of an example
3. State the need and objectives of Traffic System Management.
4. Suggest any two transport policies that will increase the use of public transportation.
5. Explain the concept of congestion pricing.
6. How does Intelligent Transportation System (ITS) help in traffic management of the city.

7. Write a note on the concept of Hyperloop.
8. What are the various steps involved in traffic accident studies? What is the outcome of such a study?
9. With a help of a neat sketch, explain the significance of Level of Service 'A' and 'F' of a road.
10. Enumerate the various factors to be considered while designing a bicycle network?
11. Explain the process of carrying out traffic volume count using any two modern sensing techniques.
12. How is Pavement Management System useful for the maintenance of road?
13. Write a note on 'Vehicle Damage Factor'.
14. Explain the First Year Rate of Return (FYRR) method of economic evaluation. Also mention the criteria for deciding the priority of projects based on FYRR.
15. Discuss how the road side interview method is conducted. Mention the information that is collected during the survey.
16. Explain the role of dowel bars in cement concrete pavements.

BE CIVIL

Air Pollution and Control (Elective - III)

(2015 Pattern)

01. Explain the plume rise and how it is estimated?
02. Write in a tabular form National Ambient Air Quality Standards(NAAQS) specified by Central Pollution Control Board (CPCB).
- 03.Explain sick building syndrome.
- 04.Write methods measurement of odour and explain any one method.
05. Explain with sketches the mechanism, working principle, application of air pollution control by Electrostatic precipitator.
- 06.Write features of Gaussian plume model and give the limitations of Gaussian plume models.
07. Write advantages, disadvantages and applications of following
 - i) Settling Chamber
 - ii) Cyclones
- 08.Explain in brief about Control of air pollution by process modification:
- 09.What are the effects of stack height? Enlist various formulae used to calculate minimum stack height as per CPCB?
- 10.Write methods to control of air pollution from automobiles and explain any one method.
- 11.Write note on economics of air pollution control.
- 12.Write a note on public hearing for EIA.
- 13.Explain Components of EIA.
14. Explain powers, functions and penalties under Air Act 1981.
15. Write note on Emission standards for stationary sources.
16. Write role of regulatory agencies and control boards in obtaining environmental clearance for project.
17. Explain air cleaning systems for indoor air pollution control.
- 18.Write a short note on High volume sampler.
19. Write and explain environmental impacts of sugar and cement industry.

BE CIVIL

CONSTRUCTION MANAGEMENT

(2015 Pattern) (End Semester) (Semester - II) (Elective - IV) (401010A)

- 01.* Explain the Selection and appointment process of Project Management Consultant.
- 02.* Explain Line of balance technique with suitable example.
- 03* Explain Genetic Algorithm with suitable example.
- 04* Explain the Profit loss statement with suitable example.
- 05* Explain Sensitivity analysis and Decision tree analysis.
- 06.* Explain the role of Infrastructure development in Employment generation.
- 07.* Explain Building and other construction workers act 1996.
- 08* Explain the Objectives of Work measurement and Work Study.
- 09* Explain the Energy cost escalation and its impacts.
- 10* Explain Value engineering and Value management.
- 11* How mathematical model will be useful in risk management.
- 12* Write short note on: Buyers supply relationship, EOQ Model.
- 13.* Explain the Importance of Human Resource management in Construction industry.
- 14.* Explain Importance and Difficulties in Capital Investments.
- 15.* Explain the need and importance of labour laws in construction industry.
- 16.* Explain with example “Artificial Neural Network”.
- 17* What do you mean by Fuzzy Logic?

B.E. (Civil) (Semester - II)
DAMS AND HYDRAULIC STRUCTURES
(2015 Pattern)

1. What are the factors affecting selection of arch dam?
2. What is a Canal Fall? Discuss the necessity of it.
3. Explain necessity of cross drainage work. Explain Syphon Aqueduct in detail with neat sketch.
4. Enlist any four Load Combinations considered for design of gravity dam.
5. Draw a labeled sketch of ogee spillway showing all components.
6. Enlist types of spillway gates and explain anyone.
7. State different corrections suggested by Khosla. Explain in detail the correction for mutual interference of piles.
8. Explain seepage failure of earthen dam.
9. Briefly explain different causes of failure of earthen dams.
10. Differentiate between weir and barrage.
11. With the help of expression explain '*Exit Gradient*'. Also give permissible values of it for various soils.
12. What is a canal? Explain three types of canals based on function.
13. Design an unlined alluvial canal section to carry a discharge of $10 \text{ m}^3/\text{s}$. The longitudinal slope is 1 in 4000 and the side slope is 0.5 H : 1 V. Use Lacey's theory and take silt factor $f = 0.9$.
14. What do you understand by river training work? What are the functions of marginal bunds?
15. What is elementary profile of a gravity dam? How it is modified to get practical profile?

BE CIVIL
HYDRO POWER ENGINEERING
(2015 Pattern) (Elective-III) (Semester-II)

- Q1)** Discuss the impact of hydro power plant on land use air, water and green house gas emission.
- Q2)** What is carbon credit? Explain history significance and sustainability in development of country.
- Q3)** Draw a neat sketch, explain pumped storage hydro power plant. Why is it not economically beneficial. State two examples.
- Q4)** Discuss with a neat sketch hydro power plant classification on hydraulic characteristic.
- Q5)** A load on hydro power plant varies from minimum 13,500 kW to maximum 48,500 kW. Three generators of 12,000 kW capacity each have been installed. Determine:
- a) Load factor.
 - b) Capacity factor.
 - c) Utilization factor.
- Q6)** R/O plant operating as a peak plant having all its capacity as a firm capacity with a weekly L.F. of 35%. What should be minimum flow in the river so that the station may serve as a load plant. The installed capacity of generator is 10,000 kW the operating under the head of '25 m' and the plant efficiency is 85%.
- Q7)** Explain different types of intake structure in hydro power plant.
- Q8)** Discuss function types and installation of penstock for surface type of hydropower plant.

Q9) Explain overall safety measures in under ground hydro power plant during and after construction.

Q10) Explain with a neat sketch:

i) Draft tube

i) Head race tunnel

Q11) Draw typical layout of power house and explain in brief.

Q12) Discuss different methods of designing penstock. What is meant by economical diameter.

Q13) Distinguish between reaction and impulse turbine.

Q14) Explain merits, demerits and constraints in hydro power development in India.

Q15) Discuss Surge tank-function, classification, examples.

Q16) Write an explanatory note on 'Draft tube'.

Q17) What is a 'cavitation' in turbine? How do you minimise cavitation?

Q18) Discuss tariffing for electric energy. What are different types. State merits & demerits of it.

B.E. (Chemical Engineering)
NANOTECHNOLOGY (Elective - IV)
(2015 Pattern)

1. Write short notes on Nanoclay and its applications.
2. Explain the principle of working of x-ray diffraction method.
3. Enlist and Explain colloidal properties of nanoparticles.
4. Write short notes on Polymer nanocomposites and fillers
5. Discuss in detail about Self-assembly and Catalysis.
6. Explain health and environmental Impacts of nanotechnology?
7. Explain any two synthesis methods of carbon nanostructures.
8. What are quantum dots, quantum well and wire? Explain in detail alongwith their properties and applications.
9. Explain pulsed laser deposition with its schematic layout.
10. Write down the short note on Quantum Cryptography.
11. Explain the steps involved in Chemical vapor deposition for nanomaterial synthesis.
12. Discuss the various nanostructured materials for Photocatalysis alongwith their properties?
13. Explain principle and operation of Transmission electron microscope.
14. Discuss Photocatalytic Reactors
15. Explain de Broglie's hypothesis.

BE CIVIL

QUANTITY SURVEYING CONTRACTS AND TENDERS

(2015 Pattern)

1. Explain the terms Standard specification and manufacturer specification.
2. State the advantage and disadvantage of manufacturer specification.
3. Explain various factors affecting value of a property consisting of land and building.
4. Explain estimation, quantity surveying and requirements of an estimator.
5. What is Bill of quantity and prepare a standard format for billing.
6. Explain how depreciation affects the value of a property. Explain the percentage method or declining balance method of calculating depreciation.
7. Explain concept of free hold and lease hold property. What are the reasons under which the property is leased and what are the liabilities of lessor and lessee.
8. Draft a brief tender notification to execute the construction of public building worth 50 lakh to be completed in 24 calendar months involving prequalification of tenders.
9. Explain the term arbitration, its objective and advantages. Which are the matters that can be and cannot be referred to arbitration under the provision of Arbitration act.
10. Explain the process of arbitration and award by an arbitrator. Explain powers of court to modify the arbitration award.
11. What is comparative statement and its necessity? Explain the procedure for preparing the comparative statement.
12. Before working out a tender and submitting it, what information and data needs to be collected and ascertained.
13. Explain percentage contract and Item rate contract giving their advantages and disadvantages.

14. Work out the rate per unit of the following item of work.

- a) First class brick work for super structure in cm 1:6
- b) Cement plastering to wall in cm 1:4

15. What are the essential requirements of valid contract and explain any one.

16. Can a contract be terminated or discharged, if so what are the reason for termination.

Explain any two ways in which the contract can be terminated.

17. Explain how specification is necessary to maintain quality in construction. What are the different types of specification?

B.E. (Civil)
STATISTICAL ANALYSIS AND COMPUTATIONAL
METHODS IN CIVIL ENGINEERING
(2015 Course) (Semester-II) (401009 B)

1. Explain Secant Method with an example.
2. Explain three types of means, mode and median
3. Explain regression analysis, types and applications with suitable examples.
4. From the data given below, find :
 - a. Two regression equations.
 - b. Coefficient of correlation

X	1	2	3	4	5	6	7	8	9
Y	9	8	10	12	11	13	14	16	15

5. Solve using Gauss Jordan Method :

$$10x - 7y + 3z + 5u = 6; \quad -6x + 8y - z - 4u = 5; \quad 3x + y + 4z + 11u = 2; \quad 5x - 9y - 2z + 4u = 7$$

6. Explain role of statistics in Civil Engineering.

7. Calculate mean, median, mode, mean deviation and standard deviation from following data:

Class interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	25	30	20	10

08. A person is known to hit the target in 3 out of 4 shots, whereas another person is known to hit the target in 2 out of 3 shots. Find the probability of the target being hit at all when they both try.
09. A box contains 3 red and 7 white balls. One ball is drawn at random and in its place a ball of the other colour is put in the box. Now one ball is drawn at random from the box. Find the probability that it is red.
10. Explain Gauss Siedel method with an example.

11. Solve using Gauss Elimination Method:

$$x+4y-z = -5, \quad x+y-6z = -12, \quad 3x-y-z = 4$$

12. Five men in a group of 20 are graduates. If 3 men are picked out of 20 at random.

- a. What is the probability that all are graduates, and
- b. What is the probability of at least one being graduate?

13. Explain Hypothesis testing.

14. How would you use the normal distribution to find approximately the frequency of exactly 5 successes in 100 trials, the probability of success in each trial being $P = 0.1$

15. Explain correlation analysis, its importance and types with suitable examples.

16. The following data relates to age of employees and the number of days they were reported sick in a month.

Employees	1	2	3	4	5	6	7	8	9	10
Age (X)	30	32	35	40	48	50	52	55	57	61
Sick Days (Y)	1	0	2	5	2	4	6	5	7	8

Calculate Karl Pearson's Coefficient of Correlation and its interpretation.

BE CIVIL
TRANSPORTATION ENGINEERING
(2015 Pattern)

1. Describe briefly the Marshall Method of preparing the mix design.
2. Explain the importance of dowel and tie bars in rigid pavements.
3. Define Alignment. Enlist the basic requirements of an ideal alignment between two terminal stations.
4. Describe the importance of prime coat, tack coat and seal coat during the road construction process.
5. Enumerate the salient features of Third Road Development Plan.
6. What do you mean by camber? Discuss the factors on which the amount of camber to be provided depends.
7. Write a note on Built Up Spray Grout.(BUSG)
8. What are the objectives of carrying out spot speed studies?
9. With the help of a neat sketch explain the Macadam method of road construction.
10. With neat sketches, explain the various types of regulatory signs.
11. What are the desirable properties of the sub grade soil?
12. Explain cutbacks and its types. What are its advantages over conventional bitumen?
13. Differentiate between a flexible and rigid pavement.
14. Define 'Vehicle Damage Factor' and explain its importance.
15. Explain in brief wheel load stresses and Temperature stresses in rigid pavement.
16. Enlist the advantages of Recycled Asphalt Pavements (RAP).
17. Explain the concept of ESWL.

- 18.** Explain how Impact Test on aggregates is done in the laboratory. How are the results of the test interpreted?
- 19.** Write a note on Crumb Rubber Modified Bitumen (CRMB).
- 20.** What is Foamed Bitumen? How foamed bitumen is prepared and where it is used.

BE CIVIL
ENVIRONMENTAL ENGINEERING - II
(2015 Pattern) (Semester - II)

1. Write Streeter-Phelps equation and explain the meaning each term involved in it.
2. Explain methods of waste water sampling.
3. Write characteristics of Sugar industry wastewater.
4. Write a short note on pumping of sewage.
5. Explain the Algal-Bacterial symbiosis in oxidation ponds. Discuss the design criteria of Oxidation Pond.
6. Write a detailed note on Sludge digester.
7. Write working principle of rotating biological contactor. Also write the advantages and disadvantages.
8. Write a note on phytoremediation for waste water treatment.

9. Explain aerated lagoon with respect to its working principle, design parameters and applications.
10. Explain in brief working principle, advantages and disadvantages of Packaged sewage treatment plant.
11. Explain in brief Self-purification of natural stream.

12. Draw the flow diagram for primary settlement of sewage. State the type of impurities removed in each unit.
13. Discuss different methods of sludge treatment and disposal.
14. Write principle and stages of anaerobic digestion. Explain factors affecting digestion process.
15. State modifications in ASP and hence differentiate between completely mixed ASP and extended processes.
16. Explain the following points related to Distillery industry.
 - iii) Flow sheet of wastewater treatment.
17. Explain equalization and neutralization unit process with respect to its working principle, need, factors affecting the process and application.

B.E. (Computer Engineering)
Advanced Digital Signal Processing
(2015 Pattern) (Semester - II) (Elective - III)

1. What is the role of Order statistics filter in image enhancement? Explain the median filter with mathematical model and applications.
2. Derive transfer function of a decimator or Interpolator.
3. Define and compare 1-D DFT with 2-D DFT. State its applications.
4. Describe the MA and ARMA models for power spectrum estimation
5. What is image enhancement in digital image processing? Explain any two gray level transforms used for image enhancement.
6. Discuss the use of Adaptive FIR filter in echo cancellation.
7. Explain the process of sampling rate conversion by a factor I/D .
8. What is the difference between Speaker Identification and Speaker Verification? What features are extracted from a speech signal in both the cases.
9. How DCT is different than DFT? Define and state the properties of DCT.
10. Compare Steepest Descent algorithm with Newton's algorithm used in adaptive FIR filter design.
11. What is the necessity of speech coding? Explain the working of LPC coding with example
12. With mathematical models state the use of LPF and HPF for image smoothing and sharpening.
13. Define energy density spectrum and power density spectrum. How to estimate energy density spectrum?
14. What is periodogram? With block schematic explain how it is obtained using Welch method?
15. How 2-D DFT can be used for linear filtering?
16. Explain the algorithmic steps for the LMS algorithm.
17. Explain the use of Vector Quantization in speech processing.
18. Explain the terms Speech Synthesis, Speech Recognition and Feature Extraction w.r.t. Speech processing.

B.E. (Computer Engineering)
ARTIFICIAL INTELLIGENCE AND ROBOTICS
(2015 Pattern) (410242) (Semester - I) (End Semester)

1. What are the drawbacks of propositional logic used in representation of facts?
2. Comment on the hardware components of a mobile robot.
3. Explain the architecture of information retrieval system
4. Compare and explain Depth First search and Breadth First search methods.
5. Describe PEAS for WUMPUS world problem.
6. Explain goal stack planning with an example of blocks world.
7. Explain the applications of Natural Language Processing.
8. Explain use of robots in agriculture and forestry.
9. Explain any two types of learning.
10. Explain vertical decomposition in robotics.
11. What is Artificial Neural Network? Give two applications of artificial neural networks in detail.
12. With an example explain A star algorithm. State the properties of A star algorithm.
13. Explain machine translation using natural language processing (NLP).
14. Explain Backtracking and look ahead strategies in constraint satisfaction problems
15. Comment on the fundamental problem in robotics.
16. Explain localization and comment on any two types of localization.
17. Comment on sonar sensing.
18. Explain the process of resolution with proper example.
19. Draw the architecture of an expert system. Explain each functional block in detail.
20. Comment on how robotics can be used to design intelligent vehicles
21. Comment on the methodologies on which laser rangefinders are based.
22. Explain any two sensors used in robots.
23. Compare the various weighting functions used in pose estimation
24. Explain issues regarding natural language processing in information Retrieval.
25. With the help of an architecture diagram explain feed forward artificial neural network

B.E. (Computer Engg.)
CLOUD COMPUTING

(2015 Pattern) (Semester - II) (410253 (C)) (Elective - IV)

1. Explain the steps to create an Amazon S3 Bucket and managing associated objects.
2. Explain the client server architecture of Docker? What are Network ports and unix sockets?
3. Write a note on multitenant nature of SaaS solutions.
4. Describe cloudlets for mobile cloud computing with neat diagram and differentiate between cloudlets and clouds.
5. Explain Docker with respect to process simplification. Broad support and Adoption, Architecture.
6. Write a note on cloud file systems with architecture.
7. Explain the solution stack: LAMP. Also, explain how LAPP is considered as a more powerful alternative to the more popular LAMP stack.
8. Explain the steps for configuring a server for EC2.
9. Explain the cyber Physical system [CPS]. Explain CPS components.
10. What is the impact of cloud on operating systems in the future?
11. Explain open cloud consortium.
12. Explain the following.
 - CPU virtualization
 - Memory virtualization
13. What are AWS load balancing services? Explain the Elastic Load Balancer and its types with its advantages.
14. Write a note on innovative applications of IoT.
15. What is Energy aware cloud computing? Explain in detail.

B.E. (Computer Engineering)
COMPILERS
(2015 Pattern) (Elective - III) (Semester - II)

1. Explain following optimization techniques along with suitable example.
Common Sub-expression Elimination,
Dead Code Elimination
2. Explain following terms with suitable examples S-attributed Grammar, L-attributed Grammar.
3. Explain the term Register Descriptor and Address Descriptor along with suitable example.
4. Why Code Optimization is required? Differentiate Local and Global Optimization.
5. Write Lex Specification to count lines, spaces, tabs and words from given input.
6. What is Three Address Code? Generate three address code for
 $a = b * -c + d$
7. Explain labelling algorithm used in Code Generator.
8. Explain any two Storage allocation strategies.
9. Explain Following Loop Optimization Techniques
Code Motion
Strength Reduction
10. Write Syntax Directed Definition for constructing syntax tree for arithmetic expressions.
11. What are the Source Language issues? Explain any two.
12. List and Explain loops in Flow Graph.
13. Explain Display Mechanism. How Display is used to access non-local data.
14. Explain Call by Value and Call by reference.
15. Explain Error recovery strategies in Parser.
16. Construct the DAG for following assignment statement
 $a + b * c + b * c + d$
17. Draw a Sample Flow Graph and Explain Generation and Killing of expression with respect to it.
18. What is Basic Blocks? Explain the algorithm used to partition three address code into Basic Block.
19. Compare Static Scope and Dynamic Scope.
20. List the issues in Code Generation. Explain any two of them.

B.E. (Computer Engineering)
EMBEDDED AND REALTIME OPERATING SYSTEM
(2015 Course) (Elective - III) (Semester - II) (410252(C))

1. What are various Temporal parameters of real-time processes? List and explain.
2. Describe the embedded software development process.
3. What are issues in resource reservation. Explain Resource reservation protocol with diagram.
4. Explain priority-based service disciplines for switched networks in multiprocessor systems for real-time communication.
5. How does ARM micro-controller differ from a SHARC processor? Justify your answer.
6. Enlist various Internet enabled system protocols and explain one with its features.
7. How to represent Precedence constraints and data dependency among real-time tasks? Explain with diagram.
8. What is priority inversion problem in real-time systems? How this problem can be solved? Give details
9. To design sophisticated embedded systems for high computing performance, which performance metrics are used? Explain.
10. Explain with example Resource conflicts and blocking
11. Explain types of serial communication with examples.
12. What is RTOS? Differentiate Hard versus soft real-time systems and their timing constraints.
13. What is interrupt latency? Justify its role in handling interrupts in RTOS environment.
14. How Rate Monotonic (RM) algorithm checks the schedulability of tasks? What are limitations of RM algorithm
15. What are various Real-time requirements in the domain of Signal processing or Multimedia
16. Explain with example Validation and debugging in an embedded system.
17. How interrupts are handled in RTOS environment?
18. Describe and compare RS232C and SDIO Devices.
19. With the help of example, demonstrate the concept of critical section
20. Draw and explain model of real-time communication with related terminologies.

B.E. (Computer Engineering)
HIGH PERFORMANCE COMPUTING
(2015 Pattern) (Semester - I) (410241)

1. Define and explain the term Granularity.
2. Write a note on minimum and cost optimal execution time
3. How to improve speed of communication operations?
4. Explain parallel Depth First Search for solving 8 puzzle problem.
5. Define and explain the term Task interaction graph.
6. Define and explain the term Degree of Concurrency.
7. What is CUDA? Draw and explain CUDA architecture in detail.
8. Explain Circular shift operation on mesh and hypercube network.
9. Explain the effects of granularity on the performance of a parallel system
10. Differentiate between Static and Dynamic mapping techniques for load balancing
11. Explain Matrix - matrix multiplication in detail.
12. Explain Store - and - Forward and packet routing with its communication cost.
13. Discuss the applications that benefit from multi - core architecture.
14. Explain performance matrices of parallel systems.
15. Describe CUDA communication and synchronization along with CUDAC functions.
16. Explain Dijkstra's algorithm in parallel formulation.
17. Explain how the CUDAC program executes at the kernel level with example.
18. Explain odd - even transportation on bubble sort using parallel formulation.
19. Write a short note on: Managing GPU memory.
20. Explain compare - exchange and compare - split operation on parallel computers.

B.E. (Computer Engineering)
HUMAN COMPUTER INTERFACE (Elective - IV)
(2015 Pattern) (Semester - II) (410253B) (End Sem.)

1. Which are the different approaches to user modeling in knowledge representation in adaptive help system of user support.
2. Discuss about Cognitive model in detail.
3. Which are the sources of information and data collection in task analysis? What are the uses of task analysis ? Explain all in detail.
4. What are the requirements of user support system.
5. Discuss about software life cycle in HCI?
6. Name any five diagrammatic notations used in dialog design? Explain any 2 in details with suitable example and figures.
7. Discuss about CUSTOM and OSTA in context with social technical models in capturing requirements in an organization.
8. What are the basic human and computer abilities required for HCI? Explain any three of each in detail
9. Explain role of HCI in design of mobile device.
10. Write short note on any two of following
 - a. Usability Testing
 - b. User Acceptance Testing
11. Discuss about Evaluation through user participation in details.
12. What do you mean by stakeholders in any organization ? Which are the different categories of stakeholder? Classify stakeholders in airline booking system accordingly.
13. What is HCI? What is role of Psychology, Ergonomics, and Understanding in HCI?
14. Explain Heuristic evaluation in detail?
15. What do you mean by Task Analysis? Which are three different approaches to task analysis ? Explain each with suitable example.

B.E. (Computer Engineering)
INFORMATION AND CYBER SECURITY
(2015 Pattern) (Semester - II) (410251)

1. What are different phases of cyber forensics? Explain with suitable diagram.
2. Explain working of AES in detail.
3. Explain any two password management practices.
4. What is VPN? Explain types of VPN.
5. What is block Cipher? Explain counter mode of block Cipher.
6. What is steganography? What are the applications and limitations of steganography?
7. List and explain various elements of Information security.
8. Explain ISAKMP protocol of IPSec with header format.
9. Compare PGP, MIME and S/MIME.
10. What is cyber stalking? How to identify and detect cyber stalking.
11. Discuss elliptic curve cryptography in detail.
12. Discuss PII confidentiality safeguards.
13. Explain packet filtering firewall.
14. What is authentication? Explain various methods authentication.
15. Discuss the working of IPSec. What are the benefits of IPSec.
16. Explain need and challenges of intrusion detection system. Define signaturebased IDS.
17. Differentiate between IP-V4 and IP-V6.
18. Explain personally identifiable information PII. Describe PII impact levels with examples.
19. What are the various types of firewall. Discuss limitations of firewall
20. Explain secure socket layer handshake protocol in detail.

B.E. (Computer Engineering)
MACHINE LEARNING
(2015 Course) (410250) (Semester-II)

1. Write shorts notes on: Bernoulli naive Bayes.
2. What is categorical data? What is its significance in classification problems?
3. Explain the role of machine learning algorithms in Spam filtering.
4. Explain the role of machine learning algorithms in Natural Language processing.
5. Write shorts notes on: Gaussian naive Bayes.
6. With reference to Deep Learning, Explain the concept of Deep Architectures?
7. Explain Data formats for supervised learning problem with example.
8. With reference to machine learning, explain the concept of adaptive machines.
9. Explain the Lasso, and ElasticNet types of regression.
10. Explain the non-linear SVM with example.
11. What are building blocks of deep networks, elaborate.
12. What problems are faced by SVM when used with real datasets?
13. Explain role of machine learning the following common un-supervised learning problems:
 - i. Object segmentation
 - ii. Similarity detection
14. Explain Evaluation methods for clustering algorithms.
15. What are Linear support vector machines? Explain with example.
16. With reference to Hierarchical Clustering, explain the issue of connectivity constraints.
17. With reference to Clustering, explain the issue of “Optimization of clusters”
18. Define Bayes Theorem. Elaborate Naive Bayes Classifier working with example.
19. Explain with example the variant of SVM, the Support vector regression.

B.E. (Computer Engineering)
SOFTWARE DEFINED NETWORKS
(2015 Pattern) (Semester - II) (Elective-IV) (410253A)

1. Enlist benefits of Network Functions Virtualization
2. SDN Use Cases in the Data Center. Explain with architecture.
3. Explain functionality open flow switch, controller & protocol in SDN.
4. Define use of POX, Beacon, Floodlight, Ryu and Open Daylight.
5. Explain SDN Future?
6. Write a short note on following use cases.
Wide Area Networks
Service Provider and Carrier Networks
7. What are challenges of traditional networks? Do you think SDN will overcome? Justify it.
8. What is SDN? Explain SDN architecture.
9. In SDN "Open Flow Protocol plays an important role". Justify this statement.
10. What is an In-line network function?
11. Differentiate between Open SDN, Overlays, and APIs.
12. What are SDN Open source controllers? Explain in Detail.
13. Define Data Centre & Explain in detail demands of Data Center.
14. What are the fundamental characteristics of SDN? Explain in brief
15. Explain message types and how pipeline processing is carried out in Open Flow.
16. Are SDN and network virtualization the same? Differentiate them.
17. Difference between NFV and NV.
18. Which are different leading NFV Vendors?
19. Who implemented Real-World Data Center? Does it running in real time? Justify your answer.
20. What is Mininet? Explain basic commands of Mininet

B.E (ELECTRICAL)
HIGH VOLTAGE ENGINEERING
(2015 Pattern) (Semester - II) (Elective - III)

1. Explain with a neat sketch principle and working of electrostatic voltmeter. Write down its merits and demerits.
2. State and explain the causes of over voltage due to switching surges and system fault.
3. Describe earthing and shielding of high voltage laboratories.
4. Explain the working of three cascade connected transformers used for generation of AC voltages. State its advantages and disadvantages.
5. Write a note on generation of high impulse voltage.
6. Explain "insulation co-ordination". How are protective devices chosen for the optimal insulation level in power system.
7. Classify the different High voltage laboratories and give salient features of each of them.
8. List the different tests done on surge arresters? Mention the procedure for testing.
9. Compare Townsend's theory and streamer mechanism of breakdown in gases.
10. With neat diagram explain CVT. Explain its advantages.
11. Explain corona discharges for point plane electrode combination with positive and negative pulse application.
12. Explain in details Reynold's and Mason's theory of charge formation in clouds.
13. With a suitable figure explain the working of generating voltmeter. State its advantages.

B.E. (Electrical Engineering)
HVDC and FACTS - B
(2015 Pattern) (End Semester)

1. Explain the steps to be taken in sequence when fault occurs on dc side of HVDC system.
2. For six pulse full wave bridge circuit, state the assumptions made in deriving the expression for ideal dc voltage. Draw diagram and derive the expression for ideal dc voltage
3. Explain converter operation as inverter.
4. Explain how midpoint shunt compensation rapidly increases the transmittable power.
5. Write note on dc link converter topologies.
6. Write note on control structure of UPFC.
7. Write note on harmonic control produced in HVDC system.
8. Discuss the two applications of HVDC light.
9. Compare inductive and capacitive vernier mode operation of TCSC. Differentiate between bypass breaker mode and bypass thyristor mode of TCSC
10. Explain the conditions for transient free switching of TSC.
11. Explain basic operating principles and implementation of UPFC by two back to back voltage sourced converters.

B.E (ELECTRICAL)
ILLUMINATION ENGINEERING
(2017 Pattern) (Semester - II) (Elective - IV)

1. Explain in details the factors to be considered for design of illumination scheme for - Commercial installation.
2. Explain following terms related to road lighting- Threshold increment, Surround ratio, Overall uniformity of road luminance, Luminance yield.
3. State the detail classification of dimmers and explain any one type with suitable diagram.
4. With suitable diagrams explain construction and working of OLED.
5. With suitable diagram explain construction and working of Compact Fluorescent Lamp (CFL).
6. With suitable diagrams explain arrangement of luminaries for road lighting.
7. Compare LED with fluorescent lamp.
8. Explain in details the factors to be considered for design of illumination scheme for - educational institute.
9. With suitable diagrams explain different fibre optic guide.
10. Explain polar diagram and state its significance.
11. Draw a neat sketch of human eye, name all the parts. Explain function of any 2 parts.
12. With suitable diagrams explain different arrangements of projectors for flood lighting.

B.E. (Electrical Engineering)
Intelligent Systems And Applications In Electrical Engineering
(2015 Pattern) (End Semester) (Elective - III)

1. Explain basic fuzzy set operations.
2. What is BAM? Explain its architecture
3. Explain various de-fuzzification methods.
4. Write short note on Genetic algorithm and explain selection genetic operator.
5. Write note on various ANN architectures
6. Explain supervised and unsupervised learning methods.
7. Differentiate between fuzzy logic and crisp logic.
8. Explain various defuzzification methods.
9. Explain rule based system in expert system.
10. Draw and explain Perceptron model.
11. Explain software architecture used in expert system.
12. State and explain predicate logic formula.

B.E. (Electrical Engineering)
POWER ELECTRONICS CONTROLLED DRIVES
(2015 Pattern) (Semester - II) (403148)

1. What is the V/f control strategy? Explain with necessary diagram V/f control method using power control devices.
2. Explain load equalization in an electric drive. How flywheel helps in load equalization process.
3. Write a short note on Drives used in Sugar mills. Also mention the load requirements like power ratings, speed, duty cycle etc.
4. Explain closed loop control speed control of DC motor with inner current control loop. How below and above speed control is obtained.
5. With the help of neat block diagram, explain the closed loop speed control of self controlled synchronous motor drives fed from VSI.
6. With the help of block diagram explain vector control of induction motor.
7. Justify “steady state stability depends on relative characteristics of the motor and load both”.
8. How Induction Motor is converted to Characteristics of DC motor.
9. Explain Industrial application of Electric drives in Electric Traction.
10. Write in brief about topology, control and applications of AC servomotor drives.
11. With the help of neat block diagram, explain the closed loop speed control of self controlled synchronous motor drives fed from CSI.
12. Write a short note on applications of drives in machine tool.
13. What is the selection criterion for motors? How ratings of the motor subjected to variable load duty is decided.
14. Write a brief note on Thermal model for heating and cooling.
15. A drive has following parameters: $J=10 \text{ kg-m}^2$, $T = 100-0.1N$, N-m, passive load torque $T_1= 0.05N$, N-m, where N is speed in rpm. Initially the drive is operating in steady state. Now it is to be reversed. For this motor characteristics is changed to $T= -100-0.1N$, N-m. Calculate the time of reversal.

BE ELECTRICAL
SWITCHGEAR & PROTECTION
(2015 Pattern) (403147) (Semester - II)

1. Draw the block diagram and explain the working of carrier current protection scheme for long transmission lines.
2. Draw the neat sketch & explain in detail the construction & working principle of SF6 circuit breaker.
3. Draw the necessary sketches for 3-zone distance protection scheme for transmission lines and explain it.
4. With neat block diagram, explain numerical relays. Also enlist its advantages.
5. Explain the resistance switching in case of circuit breaker.
6. Prepare a list of various types of faults taking place in alternator on stator side and rotor side and explain protection against- (i) Loss of field
(ii) Rotor temperature rise.
7. Explain static relays with block diagram and operating principle. Also state its merits and demerits.
8. What do you mean by power swings and arc resistance? Explain the effect of power swings and arc resistance on the performance of the distance relay.
9. What is fault? What are the causes of faults? State the different types of fault.
10. Enlist the abnormal operating conditions and causes of failure of 3-phase induction motor?
11. Explain the phenomenon of over fluxing in the transformer. Suggest suitable protection for the same.
12. What are the essential qualities of protective relaying? Explain.
13. Compare Impedance relay, Reactance relay and Mho relay with reference to application and characteristics used for protection of transmission line.
14. Explain the protection against the single phasing of 3-ph Induction motor.

B.E (ELECTRICAL)
VLSI DESIGN (Open Elective - IV)
(2015 Pattern)

1. Explain the need of PLDs. Compare ASIC with general purpose processor and microcontroller.
2. Differentiate between functions and procedures.
3. Write VHDL code to detect a 110 sequence using Moore machine.
4. Explain with diagram CMOS NAND gate and CMOS NOR gate.
5. Explain the VLSI design of signal generator using VHDL code to realize it.
6. Explain with diagram the design of serial data receiver. Write the VHDL code to realize a 7 bit data receiver.
7. List the features, specifications and applications of CPLD.
8. Explain with diagram the derivation of T flip flop from JK flip flop.
9. Compare TTL, ECL and CMOS logic families.
10. Write VHDL code for a 2 bit asynchronous up-down counter
11. Draw and explain the CMOS inverter voltage transfer characteristics.
12. Explain with diagram a generic architecture of FPGA.

B.E. (E & TC) (Semester - II) (Elective - III)
Audio and Speech Processing
(2015 Pattern)

01. Describe the sequences of events leading to auditory nerve spiking when acoustic pressure wave appears on the ear.
02. Draw and explain the block schematic of spectral subtraction method for wide band noise removal. With the help of spectrum how to estimate noise are suppress it from speech signal.
03. Explain ADSR envelope. What are temporal features of musical wave? Explain in detail.
04. Explain the AMDF method to estimate the Pitch period of speech signal
05. Draw and explain discrete-time LTV model of speech production.
06. Explain the procedure for computation of pitch and formants based on cepstral analysis of speech.
07. Explain anatomy of human auditory system. Explain the role of cochlea in perception of sound.
08. Describe sub band coding of speech. What are QMFs? How are QMFs used in sub band coding?
09. Explain the principal of linear predictive analysis? Explain the method of finding LPC coefficients using autocorrelation method.
10. With the help of a block diagram explain how MFCC coefficients are obtained from given speech signal.
11. What is homomorphic processing of speech signal? How it is useful separation of vocal tract filter response and vocal excitation signal.
12. Explain channel vocoder in detail with block diagram
13. What is DPCM? Explain in detail the comparison of DPCM and PCM. Comment on bit rate and SNR.
14. Explain Linear predictive coder in detail.
15. Explain HMM based isolated word recognition system .

B.E. (E & TC) (Elective - IV)
BIOMEDICAL ELECTRONICS
(2015 Pattern)

1. Explain the working principle of MRI Scanner. Explain with Block Diagram the working of MRI Scanner.
2. Write short note on Dental instruments
3. Explain the term Superior and Inferior vena cava.
4. Explain in detail sensor used for measurement of body temperature.
5. Explain SA node and AV node in electro conduction system of heart.
6. Explain ECG lead configuration.
7. What are the objectives of Biomedical signal analysis? Explain ECG signal processing for base line interference
8. Explain the EEG application for Epilepsy.
9. Explain the technique to cancel out maternal ECG from fetal ECG.
10. Explain in detail the active filter to remove noise from ECG signal.
11. What is important of grounding and shielding? Explain grounding & shielding techniques for medical equipment.
12. Explain the motion artifact? How to remove the motion artifact?
13. Write down the algorithm for QRS detection.
14. Explain ECG classification for normal and abnormal state using Multilayer Perceptron.
15. Explain in detail the method for muscle noise filtering.
16. Explain CT scanner working principle and scanning system.

B.E. (E&TC)
BROADBAND COMMUNICATION SYSTEMS
(2015 Pattern) (Semester - II)

- 01.** Explain three windows of transmission for optical fiber based on fiber attenuation characteristics what is scattering? Explain various types of scattering.
- 02.** What are different steps required for satellite uplink design.
- 03.** Explain with diagram following satellite orbits and their applications.
- i) Polar
 - ii) Inclined
 - iii) Equatorial
- 04.** Explain all four types of antennas used for satellite communication. What are their applications.
- 05.** Write short notes on power systems used in satellite.
- 06.** Explain with block diagram DWDM system and enlist DWDM components.
- 07.** Explain rise time budget for digital link in optical fiber. Write expressions for total system rise time and bandwidth for NRZ and RZ data formats.
- 08.** Enlist types of optical amplifiers. Explain working principle of EDFA.
- 09.** An earth station needs to calculate the 100K angle to a geostationary satellite in the Indian ocean operated by Intelsat. The details of the earth station site and the satellite are as follows. Earth station latitude & longitude are 52.0°N & 0° satellite longitude (sub satellite point) in 66.0°E Earth station is in Northern Hemisphere.
- Calculate :
- a. Central angle
 - b. Elevation angle
 - c. Intermediate angle &
- 10.** Explain with help of block diagram of typical Telemetry, Tracking, Command and Monitoring (TTC & M).
- 11.** State Kepler's three laws of planetary motion. Give mathematical formulation. Draw necessary diagrams.
- 12.** Draw and explain single conversion transponder for 6/4 GHz band. Specify frequencies at each stage.

B.E. (E & TC)
Industrial Internet of Things
(2015 Pattern) (End Semester) (Elective - IV)

1. What is hype cycle? Describe it with reference to IoT and IIoT.
2. Explain Role of Sensors in IIoT?
3. Elaborate on any one quantitative data analytics technique.
4. What is use of R Programming in data analytics? Explain in detail
5. Elaborate on how you will use IoT for remote healthcare.
6. Explain smart metering system.
7. What is role of IIoT in plant automation
8. What is NFC? How is it useful in IoT/M2M applications.
9. Explain any two types of Messages in CoAP
10. Explain the relationship between web technology and IIoT
11. Security is a key issue in IIoT. Justify.
12. What is role of cloud in IoT? Explain.
13. What is use of IIoT in plant maintenance
14. Explain any one IoT platform.
15. Elaborate on the three service models used in Cloud based IoT platform.
16. Explain the AMQP protocol and its use in IIoT systems
17. What is RPL? Explain how it is useful in IIoT implementations
18. What are the various features of CoAP?

B.E. (E&TC)
MACHINE LEARNING
(2015 Course) (Elective - III) (Semester - II) (404191(A))

- 01.** What do you mean by linear regression?
- 02.** What is Dropout? How it solve problem of over fitting? Give the process of implementing dropout in deep neural networks.
- 03.** How deep learning overcomes the challenges in conventional machine learning techniques? Draw and explain the architecture of Convolutional Neural networks.
- 04.** Describe Parametric and non parametric learning with their advantages and limitations. State any four applications where machine learning is used?
- 05.** What is over fitting in machine learning? What are the different methods to overcome the over fitting problem. Describe in brief.
- 06.** What is Gaussian Mixture Model or Mixture of Gaussian (GMM)? Compare GMM with Clustering.
- 07.** Describe with the help of suitable example, the algorithm for Hebbian learning rule.
- 08.** Why kohonen networks are called as Self organizing Feature Maps? Justify with suitable example that, 'SOFMs are topology preserving networks'.
- 09.** What are the various features of ANN? With the help of neuron architecture, state and explain the resemblance (similarity) of ANN to biological neural network.
- 10.** Using McCulloch-Pitts Neuron (MP) neuron model, implement ANDNOT function.
- 11.** What is Learning vector Quantizer (LVQ)?
- 12.** Describe the learning algorithm for Radial Basis Function network (RBFN). Explain with suitable example how radial basis functions are used in training.
- 13.** Why Support vector machines are called as Kernel Machines? Using Gaussian Kernel, describe how non-linear decision boundaries are obtained in SVM.
- 14.** What is the need of Dimensionality Reduction in machine learning? How PCA is used for dimensionality reduction?
- 15.** What is vanishing gradient problem in multilayered neural networks? Explain how the saturation in activation affects the gradients?

B.E. (E & TC)
MOBILE COMMUNICATION
(2015 Course) (404189) (Semester-II)

- 01.* Explain Impulse response model of multipath channel.
- 02.* Compare 1G to 5G mobile generation.
- 03.* Draw LTE frame structure and list out LTE design parameters.
- 04.* With neat diagram, describe co-channel and adjacent channel interference in GSM.
- 05.* Explain with neat diagram various interfaces used in GSM.
- 06.* List out various radio transmission parameters in GSM system.
- 07.* Explain channel concept in GSM system and classify them.
- 08.* Compare Circuit switching, Message switching and Packet switching techniques.
- 09.* Describe the working operation of Electronic switching system with diagram.
- 10.* Explain with neat diagram Intra-BSC and Inter-BSC hand over in GSM.
- 11.* With neat block diagram explain architecture of SMS for point to point service.
- 12.* Explain HSCSD Architecture for enhancement of GSM circuit switched data transmission.
- 13.* With neat diagram describe GSM system Architecture.
- 14.* Explain in detail the significance of GSM frame structure.
- 15.* List out and explain in brief Disruptive technologies for 5G.
- 16.* With the help of Layers, explain 5G concept in wireless technology.

B.E. (E&TC)
PLCS & Automation (Elective - III)
(2015 Pattern) (Semester - II)

- 01.* Explain the process control elements with the help of process control system.
- 02.* Explain with neat diagram stepper motor as an actuator? Explain its advantages and applications.
- 03.* Compare PLC and SCADA
- 04.* Compare NC, CNC and DNC
- 05.* What is the role of Panel Engineering in automation?
- 06.* Explain the DPT with its applications.
- 07.* Write short note on Control System Stability.
- 08.* Write a short note on BLDC.
- 09.* Explain electrical signal transmission systems along with advantages and disadvantages.
- 10.* What is sensor compensation and linearization technique? Why it is necessary?
- 11.* What you will consider to select PLC for an application?
- 12.* Draw and Explain bottle filling plant, construct ladder diagram for the same? (Assume Suitable data necessary).
- 13.* Write short note on: Foundation Fieldbus
- 14.* Write short note on: TCP/IP Protocol
- 15.* Explain MTU and RTU along with their functions.
- 16.* Explain architecture of DCS in detail.
- 17.* Explain the elements of SCADA.
- 18.* Explain Regulatory Control and Human Aided Control systems with suitable examples.

B.E. (E & TC) (Elective - IV)
ROBOTICS
(2015 Pattern)

- 01 Explain the basic structure of robot.
- 02 How direction is sensed by robot? What are different algorithms available for sensing direction? Write any one algorithm in detail. What is the computational complexity of this algorithm?
- 03 Explain the Torque, proximity and range sensor.
- 04 What is mean by Image acquisition and processing?
- 05 What are the three different types of grippers? Explain in brief.
- 06 Explain the characteristics of Stepper motors and AC motors.
- 07 Explain the terms with reference to sensor.
- 08 What are different design models for mechanical arms and lifting systems.
- 09.** Explain the Newton -Euller formulation for RP manipulators?
- 10.Explain the trajectory planning for flexible robots?
11. Write a note on: Robot language classification.
- 12.What are the different components and structure are present in roboticsarms?
13. Write a case study on Human Robot Interaction.
14. What are recent advances in the field of robotics? What are the challenges in this field?
- 15.What are different types of joints? Describe the workspace formed by these joints or combination of joints.

OR

P.T.O.

B.E. (E & TC)
WIRELESS SENSOR NETWORKS
(2015 Course) (Semester - II) (End Semester) (Elective-IV)

1. What are the performance metrics of WSN, Explain.
2. Explain what are different ranging schemes.
3. What are different clustering techniques Explain any two.
4. What is testing and validation in WSN application
5. Write a short note on sensor Network Communication stack.
6. What is significance of naming and addressing in WSN.
7. Explain in detail Insteon protocol.
8. Explain communication security in WSN.
9. Explain the Denial of- service attack at each layer.
10. What is data aggregation in WSN. explain.
11. Explain design and deployment w.r.t any one WSN application.
12. Explain top down approach in design.
13. Write a short note on requirement analysis.
14. Explain what are routing metrics in WSN.
15. What is location based routing explain.
16. What are challenges in localization, explain.

B.E. (Electronics) (E & TC)
PROGRAMMABLE SYSTEM ON CHIP
(2015 Pattern) (Semester - VIII)

1. Explain Microsystems technology and its application in detail
2. Explain the significance of RTL design flow for chip design.
3. Discuss various design techniques of Integrated Circuits.
4. Explain lithography method for FPGA design.
5. Explain Lithography mechanism and its different processes.
6. Describe exotic processes in MEMS Design
7. Explain Memory Packaging for SOC in detail.
8. Compare edge triggering and Level triggering with suitable examples
9. Explain various types of Deposition processes in brief.
10. Explain and draw flowchart for the design flow of RTL.
11. Explain testability of ASIC micromachining process.
12. Draw a block diagram of Hardware software Co-design. Explain in brief.
13. Describe compilation techniques required for SoC design
14. Explain Wet & Dry Etching for MEMS in detail
15. Discuss the effects of clocking parameters over SoC design?
16. Explain Deposition process of FPGA in detail.

BE (I.T)

DISTRIBUTED COMPUTING SYSTEM

(2015 Course) (414462) (Semester-II)

1. Give the disadvantage of using hierarchical caches for a web proxy. How can it be overcome through cooperative caching?
2. Illustrate the concept of naming services and DNS in distributed systems.
3. Describe the authentication process to log into a distributed system which uses Kerberos to setup a secure channel.
4. Discuss various RPC semantics in case of system failures.
5. Draw and explain in detail architecture of web service and principle behind introducing the concept of web service.
6. Explain in details with an example Ricart and Agrawala algorithm for distributed mutual exclusion.
7. Rephrase the meaning of heterogeneity in distributed system and also show how it is overcome.
8. Outline the goals of distributed systems.
9. List and explain the design goals of the Sun NFS.
10. Explain the secure mobile code in brief with reference to Java sandbox
11. Discuss the structure of request and response messages of HTTP for communication between a client and server
12. Discuss with real scenario IBM's web sphere message- queuing system.
13. Draw and explain the general organization of an Apache web server.
14. Discuss various security mechanisms in distributed systems?
15. State and explain any one primary based consistency protocol.
16. Illustrate with an example how the BitTorrent is designed to provide support for downloading video files.
17. How are digital signatures used for message authentication?

B.E. (Information Technology)
INFORMATION STORAGE & RETRIEVAL
(2015 Course) (414464B) (Semester - II) (Elective - III)

1. Explain signature structure in detail.
2. Describe multimedia data support in commercial DBMS.
3. Discuss the challenges involve in web search engine.
4. Write a note on "Ontology languages for semantic web".
5. Differentiate between data retrieval and information retrieval.
6. Explain the terms Harmonic mean, E measure, R precision, Precision histogram.
7. What is web crawling? Explain techniques used by web crawlers to crawlthe web.
8. Explain semantic web in detail.
9. What do you understand by multimedia query language? Explain various query predictors
10. Compare Boolean and vector model.
11. Explain the method for extracting data from text.
12. Describe the architecture of distributed IR.
13. Explain basic concept for Information Retrieval. Draw IR system block diagram.
14. List and explain steps of conflation algorithm.
15. Define Recommender system.