

R16

IV B.TECH I SEM

SUPPLEMENTARY EXAMINATIONS

MARCH / APRIL 2024

4. Estimate the quantity of earthwork in cutting for a road of 10 m formation width the following data using mean sectional area method or trapezoidal formula method. Side slope is 2:1 (H:V) and no cross slope.

Chainage (meters)	0	30	60	90	120	150
Ground Level	80.50	79.30	81.40	84.00	85.10	83.50
Formation Level	70.00	Rising gradient of 1 in 30				

5. (a) What is the necessity of specification? Write down specifications for a first class building.

(b) Write the Detailed Specification of Cement Concrete 1:2:4

6. (a) What is the purpose of rate analysis? Explain how to fix up the rate per unit of an item.

(b) Define standard schedule of rates

7. (a) Briefly explain the terms i) Tender ii) Tender Notice & iii) Tender Schedule

(b) Differentiate between administrative approval and technical sanction.

Subject Code: R16CE4108

IV B.Tech I Semester Supple Examinations, March-2024

OPEN CHANNEL HYDRAULICS

(CE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1.(a) Classify each of the following flows as steady or unsteady from the viewpoint of the observer:

Flow	Observer
(i) Flow of river around bridge piers.	(1) Standing on bridge. (2) In boat, drifting.
(ii) Movement of flood surge downstream.	(1) Standing on bank. (2) Moving with surge.

(b) Explain the significance of channels of most efficient section.

(c) Differentiate between Sub-critical and Super-critical flow.

(d) What is meant by 'cavitation'? What is Thoma's cavitation factor,

(e) List the advantages of centrifugal pumps over reciprocating pumps.

(f) Define well yield and residual drawdown.

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

PART-B

4 X 12 = 48

2. (a) Show that for a trapezoidal channel of given area of flow, the condition of maximum flow requires that hydraulic mean depth is equal to one half the depth of flow. [06]

(b) A uniform flow of 9 m³/s occurs at a depth of 1.5 m in a long rectangular channel 3 m wide. Compute the minimum height of a flat top hump that can be built on the channel floor in order to produce a critical depth. [06]

3. (a) State and discuss the assumptions made in the derivation of the dynamic equation for gradually varied flow. Starting from first principles derive equations for the slope of the water surface in gradually varied flow with respect to (i) channel bed, (ii) horizontal. [07]

(b) Water flows from a lake into a steep rectangular channel 3 m wide. Determine the lake level above the channel bed at the outfall if the discharge is 40 m³/s. [05]

4. (a) For a hydraulic jump in a horizontal triangular channel show that

$$3F_{r1}^2 = \frac{r^2(r^3 - 1)}{r^2 - 1}$$

Where, $F_{r1}^2 = (V_1^2 / g y_1)$ and $r = (y_2 / y_1)$ [06]

(b) A gate is to be suddenly dropped into place closing a rectangular channel 2 m deep and 3 m wide in which 6 cumec of water is flowing at a depth of 1.2 m. Will the water spill over the sides? What will be the velocity and height of the surge produced? [06]

5. (a) Explain the terms specific speed, unit speed and unit power as applied to hydraulic turbines. Deduce expressions to indicate their values. [06]
- (b) A reaction turbine 0.5 m diameter when running at 600 r.p.m., develops 265 kW, the flow through the turbine being 0.75 m³/s. Under the above operating condition, the pressure head at the entrance to the turbine is 28 m, the elevation of the turbine above the tail water level is 1.3 m and the velocity of flow at entrance to the turbine runner is 3.7 m/s. Assuming the runner vane angle at inlet as 90°, calculate the effective head on the turbine and the efficiency. [06]
6. (a) Compare discharge curves for single and double acting reciprocating pumps and indicate under what conditions are either type used. [05]
- (b) A four-stage centrifugal pump has impellers 380 mm diameter and 19 mm wide at outlet. The outlet vane angle is 45° and the vanes occupy 8% of the outlet area. The manometric efficiency is 84% and the overall efficiency 72%. Determine the head generated by the pump when running at 900 r.p.m., and discharging 59 litres/second. Also determine the power required to drive the pump. [07]
7. (a) Explain the detailed procedure for the analysis of recovery tests using Theis Recovery Method. [07]
- (b) A 1 m diameter well penetrates vertically through a confined aquifer 30 m thick. When the well is pumped at 113 m³/hr, the drawdown in a well 15 m away is 1.8 m; in another well 50 m away, it is 0.5 m. What is the approximate head in the pumped well for steady-state conditions and what is the approximate drawdown in the well? Also compute the transmissivity of the aquifer and the radius of influence of the pumping well. Take the initial piezometric level as 40 m above the datum. [05]



Subject Code: R16EE4102

IV B.Tech I Semester Supple Examinations, March-2024

SWITCHGEAR AND PROTECTION

(EEE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) What is the use of circuit breakers?
- (b) List out the different types of distance relay
- (c) List the different types of Generator faults.
- (d) What is the commonly used protection for 3 phase feeders?
- (e) What is insulation coordination?
- (f) Explain the need for neutral grounding.

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

PART-B

4 X 12 = 48

2. Explain the procedure to filling SF6 gas in a circuit breaker. And What are the applications of SF6 gas?
3. (a) Explain the difference between induction disc and induction cup relays.
- (b) Draw the R-X characteristics and explain about MHO and offset MHO relays.
4. (a) What are the various faults that occur in the rotor of an alternator and how the rotor is to be protected from these faults?
- (b) Explain in detail about Buchholz relay with a neat sketch.
5. (a) Discuss why the impedance relay is used for the three zone protection.
- (b) Explain in detail about carrier current protection.
6. (a) What are the different types of grounding? Explain the reactance grounding?
- (b) Write the advantages and disadvantages of zinc oxide lightning arrester.
7. (a) List the advantages and disadvantages of Microprocessor Based relays.
- (b) With the help of neat diagram explain the principle of static differential relay?



Subject Code: R16EE4107

IV B.Tech I Semester Supple Examinations, March-2024

POWER QUALITY

(EEE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) What are the causes for interruptions?
- (b) Write the remedies to improve power quality.
- (c) Define Total Harmonic Distortion.
- (d) What are the Power quality issues which affect distributed generation?
- (e) What is voltage sag?
- (f) What are the P-Q considerations with synchronous motor.

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

PART-B

4 X 12 = 48

2. (a) What is power quality? and explain the significance of power quality. [6]
- (b) Explain about long-duration voltage variations. [6]
3. Explain characteristics of power quality events in short and long duration voltage variations. [12]
4. (a) Explain the principles of regulating the voltage. [6]
- (b) What are the fundamental principles of over voltage protection of load equipment? Explain. [6]
5. (a) What is meant by voltage flicker. List some sources of flicker. Discuss the methods for mitigation of flicker. [6]
- (b) Discuss how the capacitors are used for voltage regulation in power systems in shunt and series configuration. [6]
6. (a) Explain about the controlling of harmonics using passive and active filters. How active filters overcome the drawbacks of passive filters in controlling of harmonics. [6]
- (b) Explain briefly about the phenomena of current distortion and the voltage distortion under the presence of harmonics. [6]
7. (a) Write a short note on power quality monitoring standards [6]
- (b) Explain about any one power quality measurement equipment [6]

Subject Code: R16EE4109

IV B.Tech I Semester Supple Examinations, March-2024

PLC AND AUTOMATION

(EEE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) List any two I/O modules of PLC with their functions.
- (b) Draw the PLC ladder diagram to realize two input EX-OR gate and write ladder program for it.
- (c). Discuss PLC timer function and their industrial applications.
- (d). Discuss about table to register MOVE function.
- (e). Define Matrix functions.
- (f). Write the principle of PID and discuss why tuning is required in PID module?

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

PART-B

4 X 12 = 48

2. a) Draw the block diagram of a PLC showing the main functional items and how buses link them also explain the functions of each block.
- b) List the input field and output field device and draw its equivalent ladder symbols. **[6+6]**
3. a) Implement the following Boolean equations in PLC ladder diagrams.
(i) $Y = (AB' + A'B)C$
(ii) $Z = (P+Q+R).(D+E).G'.H$
- b) Draw the ladder diagram and explain sequence listing to turn-on Lamp-1 for 5sec, Lamp-2 for 10sec, Lamp-3 for 15sec and Lamp-4 for 20sec sequentially. **[6+6]**
4. a) What is a Register in PLC and explain the characteristics.
- b) Explain about input and output registers used in PLC. **[6+6]**
5. Write a brief note on following
 - a) Arithmetic function
 - b) Number comparison function
 - c) Number conversion function**[4+4+4]**
6. Enlist various data handling functions with applications. **[12]**
7. Write a brief note on: a) Analog Signal processing b) Multi bit data processing **[6+6]**



Subject Code: R16CC41OE7

IV B.Tech I Semester Supple Examinations, March-2024
INTERNET OF THINGS (IOT) (OPEN ELECTIVE-II)
(EEE)

Time: 3 hours

Max Marks: 60

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

PART-A

1. (a) Write the principles of wireless sensor networks.
- (b) Summarize IoT vs M2M.
- (c) How Actuators work?
- (d) Write a short note on deployment process on Raspberry PI.
- (e) What is WAMP?
- (f) Write the list of smart agriculture applications.

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

PART-B

4 X 12 = 48

2. (a) Illustrate the functioning of various communication API's. [6M]
(b) Compare and contrast different IoT Levels. [6M]
3. (a) Describe in detail about various IoT protocols those are using for various layers. [6M]
(b) Make use of case study (Smart city), Explain about Service, IoT level, functional view, [6M]
operational view specification.
4. (a) Explain in detail about Domain model and information model specifications. [6M]
(b) How to design an Embedded device with Arduino? Explain with a case study. [6M]
5. (a) Discuss the features of Raspberry Pi Programming. [6M]
(b) Difference between raspberry pi and beagle bone black board. [6M]
6. (a) Illustrate the process of different cloud storage models. [6M]
(b) How AutoBahn and Xively used for IoT? Explain in detail. [6M]
7. (a) Discuss about home intruder detection system. [6M]
(b) Explain in detail about how to design a smart parking system and specify the role of IoT in [6M]
agriculture.

Subject Code: R16ME4101

IV B.Tech I Semester Supple Examinations, March-2024
FINITE ELEMENT METHODS
(ME)

Time: 3 hours

Max Marks: 60

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

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

PART-A

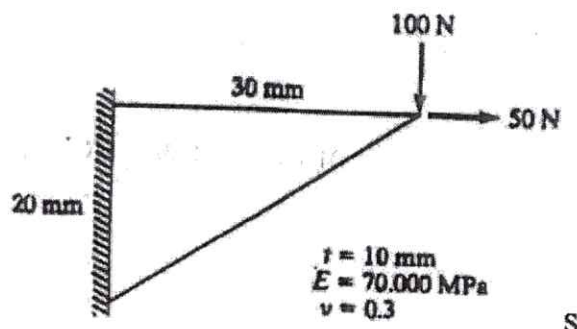
1. (a) What is the shape function. Give its practical importance.
- (b) Write the stiffness matrix for 1-d element with linear interpolation functions.
- (c) Briefly discuss the advantages of Axisymmetric Elements.
- (d) What are the practical importance of Eigen values and Eigen vectors.
- (e) Write the governing equation for a steady flow heat conduction.
- (f) What is the difference between static and dynamic analysis

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

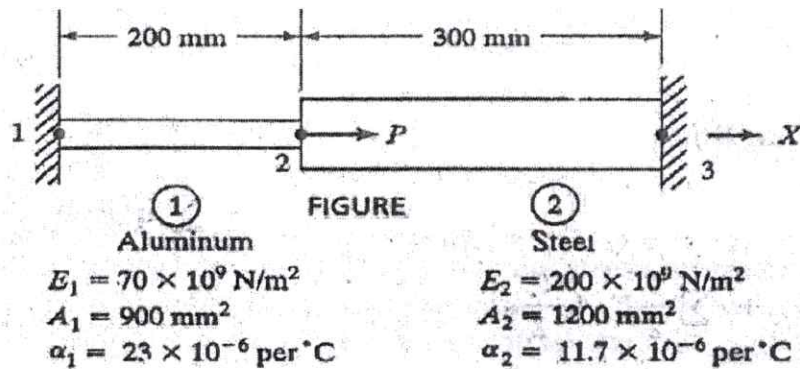
PART-B

4 X 12 = 48

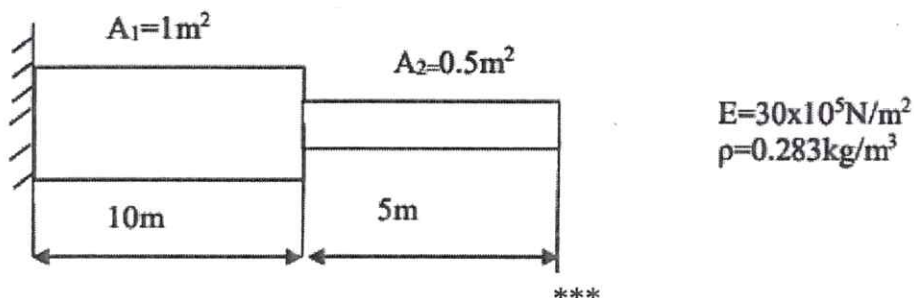
2. (a) Describe advantages and disadvantages of finite element analysis. [4]
- (b) Derive the stiffness matrix of axial bar element with quadratic shape functions based on first principles. [8]
3. (a) Write the difference between CST and LST elements. [6]
- (b) Establish the shape functions for a 3 – noded triangular element. [6]
4. For the configuration shown in Figure. Determine the deflection at the point of load application using a one-element model. If a mesh of several triangular elements is used, comment on the stress values in the elements close to the tip. [12]



5. An axial load $P=300 \times 10^3 \text{ N}$ is applied at 20°C to the rod as shown in figure below. The temperature is raised to 600°C . a) Assemble the K and F matrices. b) Determine the nodal displacements and stresses. [12]



6. (a) What are different thermal applications of finite element analysis. Compare the structural analysis with thermal analysis. [4]
- (b) Calculate the temperature distribution in the fin of 10 mm diameter, which is exposed to the convective heat transfer of $40 \text{ W/m}^2 \text{ K}$ with 300°C . The base of the fin is exposed to a heat flux of 450 kW/m^2 and the thermal conductivity of fin material is 30 W/mK . [8]
7. Determine the Eigen values and Eigen vectors for the beam shown in figure. [12]



Subject Code: R16ME4102

IV B.Tech I Semester Supple Examinations, March-2024

CAD/CAM

(ME)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) Distinguish the terms CAD and CAM
- (b) Define the terms Geometric Modelling & Solid Modelling
- (c) List out any four basic geometric commands.
- (d) What is the role of coordinate system in CNC machining and part programming?
- (e) Define the term Cellular Manufacturing.
- (f) Distinguish the terms FMS and CAPP

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

PART-B

4 X 12 = 48

2. (a) Briefly discuss the applications and benefits of CAD. [6M]
- (b) What are the display devices and storage devices, explain them briefly. [6M]
3. (a) What are 3D wire frame modelling types explain them briefly. [6M]
- (b) What are sweep representation types explain them briefly. [6M]
4. (a) Explain various display control commands briefly. [6M]
- (b) Explain various dimensioning types briefly [6M]
5. (a) Explain various CNC types briefly [6M]
- (b) Explain various Direct Numerical Control types briefly [6M]
6. (a) Explain Rank Order with suitable example [6M]
- (b) Explain Clustering method with suitable example [6M]
7. (a) Explain relative advantages, disadvantages, applications and limitations of FMS over conventional manufacturing methods. [8M]
- (b) Explain the role of computers testing? Explain briefly. [4M]

Subject Code: R16ME4103**IV B.Tech I Semester Supple Examinations, March-2024****ADVANCED MANUFACTURING PROCESSES****(ME)****Time: 3 hours****Max Marks: 60**Question Paper Consists of **Part-A** and **Part-B**.Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) List out the applications of squeeze casting.
- (b) What is the principle of Electron beam welding?
- (c) Give some examples of forming processes.
- (d) What are the different types of abrasive flow machining processes?
- (e) List out the advantages for electro-chemical machining process.
- (f) What is Laser beam machining?

[2+2+2+2+2+2]**PART-B****4 X 12 = 48**

2. (a) Explain with a neat sketch the stir casting process and mention its advantages. 6M
- (b) Discuss in detail about ceramic shell casting. 6M
3. (a) Differentiate between EBW and LBW. 6M
- (b) Mention the advantages and applications of Hybrid welding process. 6M
4. (a) Explain magnetic and high velocity forming process. 6M
- (b) Explain about the forming of thin sections in metals. 6M
5. (a) How is the mechanism of material removal explained, brief it with an example. 6M
- (b) With a neat sketch explain about the Orbital machining process. 6M
6. (a) Explain the Basic principles of material removal in electro-spark machining processes. 6M
- (b) What are the economic factors that are to be considered in material removal processes? 6M
7. (a) Discuss about Plasma Machining with a neat sketch. 6M
- (b) What are the advantages, disadvantages and applications of Electron beam machining. 6M

Subject Code: R16ME4104

IV B.Tech I Semester Supple Examinations, March-2024**POWER PLANT ENGINEERING****(ME)****Time: 3 hours****Max Marks: 60**Question Paper Consists of **Part-A** and **Part-B**.Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What are the considerations to be made while selecting the suitable site for a nuclear power plant?
- (b) What is the function of an economizer?
- (c) List the advantages of pulverized coal firing.
- (d) What do you understand by radioactive decay?
- (e). Explain the function of surge tank in hydro power plant
- (f) Name the pollutants in air due to the combustion of fossil fuels?

[2+2+2+2+2+2]**PART-B****4 X 12 = 48**

2. In a reheat cycle steam at 500 °C expands in an h.p. turbine till it is saturated vapour. It is reheated at constant pressure to 400 °C and then expands in an l.p. turbine to 40 °C. If the maximum moisture content at the turbine exhaust is limited to 15%, find (a) the reheat pressure, (b) the boiler pressure, (c) the net specific work output, (d) the cycle efficiency, and (e) the steam rate. Assume all processes ideal. 12M
3. (a) Describe the construction and working of a Circulating fluidized bed (CFB) boiler 6M
- (b) Discuss various steps involved in feed water treatment. 6M
4. (a) Explain about cyclone furnace? Where is it used? Mention its advantages and disadvantages.
- (b) Explain what you understand by balanced draught. 6M+6M
5. (a) Explain the characteristic features of a PWR 4M
- (b) A simple open cycle gas turbine plant works between the pressures of 1 bar and 6 bar and temperatures of 300 K and 1023 K. The calorific value of fuel used is 44 MJ/kg. If the mechanical efficiency and the generator efficiency are 95 per cent and 96 per cent respectively and for an air flow rate of 20 kg/s, calculate (a) the air-fuel ratio (b) the thermal efficiency and (c) the power output. 8M
6. (a) What do you understand by cavitation? What are its effects? How can it be minimized? 6M
- (b) Draw a simple layout of diesel engine power plant and indicate various components. 6M
7. (a) A thermal power plant consists of two 60 MW units, each running for 8000 hours, and one 30 MW unit running for 2000 hours per year. The energy produced by the plant is 876×10^6 kWh per year. Determine the plant load factor and plant use factor. Consider the maximum load as equal to the plant capacity. 8M
- (b) Explain the need of energy audit and list various types of energy audit. 4M



Subject Code: R16CC41OE14

IV B.Tech I Semester Supple Examinations, March-2024

ROBOTICS (OPEN ELECTIVE-III)

(ME)

Time: 3 hours

Max Marks: 60

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

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

PART-A

- 1 (a) Define a robot & degree of freedom.
- (b) Distinguish between A.C. Motor and D.C. Motor.
- (c) List the applications of robots in industry.
- (d) What you understand by forward kinematics?
- (e) What is meant by Jacobian?
- (f) Explain Skew motion.

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

PART-B

4 X 12 = 48

- 2 (a) Explain basic components of a robot system with the help of line diagram. **[6]**
- (b) Discuss the importance of robotics in automation. **[6]**
- 3 (a) Explain in detail about proximity and range sensors. **[6]**
- (b) Discuss different types of actuators used for robots. **[6]**
- 4 (a) Explain the importance of robot in spot welding. **[6]**
- (b) Explain the applications of robots in and spray painting. **[6]**
- 5 (a) Explain about homogeneous Transformations in robotics kinematics **[6]**
- (b) State the important steps in Denavit-Hartenberg(D-H) convention. **[6]**
- 6 (a) Explain the steps involved in the formulation of Lagrange-Euler dynamic model. **[6]**
- (b) Distinguish the advantages and disadvantages between Lagrange-Euler and Newton Euler formulation. **[6]**
- 7 (a) Discuss the textual robot language structure with the help of block diagram. **[6]**
- (b) Explain the following **[6]**
 - i) Straight line motion
 - ii) Joint integrated motion



Subject Code: R16ME4111

IV B.Tech I Semester Supple Examinations, March-2024

PRODUCTION PLANNING AND CONTROL

(ME)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) What is the importance of Production Planning and Control?
- (b) What is the need of forecasting.
- (c) Write a note on costs involved in inventory
- (d) What is meant by Bill of materials.
- (e) Mention few objectives of Production Control.
- (f) List out some applications of computer in production planning and control.

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

PART-B

4 X 12 = 48

2. (a) A company is manufacturing engines for an automobile. What is the scope of PPC with regard to the industry? 12M
3. (a) What is Forecasting? What are the different types of Forecasts to be made in a business cycle?
- (b) Explain any one quantitative technique used for taking make-or-buy decision. Illustrate it with an example.
4. (a) What is EOQ? What is the importance of EOQ model with price discounts in competitive markets? 8M
- (b) What is meant by ABC analysis? Explain with a neat chart. 4M
5. (a) Explain terms: i) Routing and ii) Scheduling. 4M
- (b) Explain the steps involved in the preparation of route sheet. 8M
6. (a) Explain the important techniques employed for loading and scheduling purposes. 6M
- (b) Explain master production schedule in detail. 6M
7. (a) Define Dispatching. Explain Dispatching procedure in detail. 6M
- (b) Discuss the role of computers in production control. 6M



Subject Code: R16EC4102

IV B.Tech I Semester Supple Examinations, March-2024

MICROCONTROLLERS AND EMBEDDED SYSTEMS

(ECE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

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

1.	(a)	What is the significance of EA pin in 8051?	[2M]
	(b)	What are the basic components of Relays?	[2M]
	(c)	List out the salient features of ARM controller.	[2M]
	(d)	Why microprocessor is used in embedded system?	[2M]
	(e)	What activity is involved in identifying the task within the context of a finalized embedded system?	[2M]
	(f)	Define Performance measures for real time systems.	[2M]

PART-B

4 X 12 = 48

2.	(a)	Explain the timer and counter operations of 8051 Microcontroller.	[6M]
	(b)	Write an 8051 program to receive a serial byte through RXD.	[6M]
3.	(a)	Write an 8051 subroutine to control the 7- segment display operation.	[6M]
	(b)	Explain the role and process of isolators and sensor interfacing with a 8051 microcontroller in embedded systems.	[6M]
4.	(a)	What is meant by ARM? Explain the ARM design philosophy.	[6M]
	(b)	Explain the difference between ARM instruction set and Thumb instruction set in detail.	[6M]
5.	(a)	Describe the major steps in embedded system design process.	[6M]
	(b)	Explain in detail the characteristics of embedded computing applications.	[6M]
6.	(a)	Elaborate on the various approaches to designing embedded firmware.	[6M]
	(b)	What do you mean by the prescaling of PIC timers? What is the advantage of doing so? Is it possible to apply the prescaling to watchdog timer? If so justify.	[6M]
7.	(a)	Write about a critical section using semaphores in operating system.	[6M]
	(b)	Explain the concepts of Multiprocessor System-On-Chip (MPSoC) and Shared memory multiprocessor are used in embedded applications.	[6M]



Subject Code: R16EC4103

IV B.Tech I Semester Supple Examinations, March-2024

COMPUTER NETWORKS

(ECE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) Distinguish between broadcast and point to point transmission.
- (b) What are the advantages of fibre optic cable transmission.
- (c) What is connection oriented service?
- (d) What is the unit of data transfer in Network layer?
- (e) What is TCP session?
- (f) What is DNS?

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

PART-B

4 X 12 = 48

2. (a) Explain TCP/IP reference model .Compare with OSI reference model. (6M)
- (b) Discuss different network topologies. (6M)
3. (a) Distinguish between **Circuit switching** and **Packet Switching**. (6M)
- (b) Discuss advantages and disadvantages of different transmission media. (6M)
4. Discuss and distinguish **error control** and **error detection methods** with example (12M)
5. (a) Explain **Shortest Path Routing algorithm** with example. (6M)
- (b) What is congestion? Discuss general principles of congestion control (6M)
6. (a) Discuss transport service primitives. (6M)
- (b) Distinguish between TCP and UDP protocols (6M)
7. (a) Explain different encryption types. (6M)
- (b) What is WWW? What are salient features and applications (6M)



Subject Code: R16EC4110

IV B.Tech I Semester Supple Examinations, March-2024

RADAR SYSTEMS

(ECE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) What is Radar Cross Section? What is its significance?
- (b) Define FMCW radar?
- (c) Write the Limitations to MTI Performance.
- (d) What are the 2-lowest blind frequencies of the radar when it is operating at 2GHz with a PRF of 2KHz?
- (e) List the characteristics of the matched filter.
- (f) Define beam steering.

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

PART-B

4 X 12 = 48

2. (a) List out the system losses and explain any two losses?
- (b) If a pulse radar operating with a peak power of 1MW has the following parameters: pulse width=2.4μs and PRI= 2ms. Find average power and duty cycle.
3. (a) If stationary CW radar transmits at a frequency of 6GHz, find Doppler frequency due to a target moving with a radial velocity of 200km/hr?
- (b) Derive the range and Doppler shift equations in FMCW Radar?
4. (a) What are various the types of cancellers and explain any one of them.
- (b) Describe the function of Range gated Doppler filters.
5. (a) Describe the Function of Conical Scan Tracking Radar?
- (b) Explain the function of Hybrid tracking system?
6. (a) Write the Advantage and Disadvantages of Parabolic Reflector Antennas?
- (b) Derive the matched filter-impulse response?
7. (a) Describe the operation of Branch type Duplexer with a neat block diagram.
- (b) What are the Advantages and Limitations of phased array antennas.



Subject Code: R16CS4110

IV B.Tech I Semester Supple Examinations, March-2024

MOBILE AD-HOC AND SENSOR NETWORKS

(CSE)

Time: 3 hours

Max Marks: 60

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

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

All questions carry equal marks of 12.

PART-A

1. (a) Write the advantages of proactive routing protocols
- (b) What is geo-casting?
- (c) Define slow start
- (d) Define wireless sensor network
- (e) Write the limitations of EAR protocol
- (f) List the software's used in WSN

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

PART-B

4 X 12 = 48

2. (a) Explain about MANETS and it's challenges and Applications
 - (b) Explain the DSR routing protocol in detail
3. (a) Explain the Broadcasting Strom in MANETs
 - (b) Explain the MAODV protocol with neat sketch
4. Explain the TCP solutions over adhoc networks
5. (a) Explain the Design Issues of Wireless Sensor Networks
 - (b) Discuss regularly placed sensors and randomly distributed sensors
6. (a) Discuss Directed Diffusion and Energy aware routing protocol
 - (b) Explain the STEM protocol in detail
7. (a) Explain the Sensor Network Programming Challenges
